CAREERS 360

PREPARATION Series

NIPER JEE

Previous Year Question Papers

Answer Key & Solutions

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NIPER JEE Question Papers with Solutions Ebook

Table of Contents

About this eBook

Welcome to the NIPER JEE Previous Year Question Paper With Solutions eBook! This book is designed to help you prepare thoroughly for the NIPER JEE exam. It contains authentic previous year questions from the NIPER JEE exams held between 2025 and 2020, organized by subject, and each question includes a detailed, clear solution. This eBook will help you understand the exam pattern, focus on key topics, and build the confidence you need to excel in the exam.

Features of This eBook

Subject-Wise Organization
All questions are sorted by subjects, allowing you to concentrate on one subject at a time and practice efficiently. This makes your preparation structured and targeted, ensuring comprehensive coverage of the syllabus.

Accurate & Explained Solutions
Each question is provided with a straightforward and well-explained answer, helping you understand the logic and approach required to solve similar problems in the actual exam.

Authentic Exam Coverage
The questions are taken from real NIPER JEE exams conducted in the year 2025, 2024, 2022, 2020 and 2019, giving you the most relevant and up-to-date practice for the actual test.

NIPER JEE 2025 Memory-Based Question Paper with Solutions

The NIPER JEE 2025 memory-based question paper with solutions is an important resource for aspirants as it helps them evaluate their performance immediately after the exam and

estimate their probable scores before the official results are released. Since the exam was conducted in computer-based mode and the official question paper is not provided at the time of the test, memory-based papers compiled from students' recollections offer valuable insights into the types of questions asked and the exam's difficulty level. The 2025 exam was reported to be of moderate difficulty, making it accessible yet challenging enough to test candidates' knowledge in pharmaceutical sciences and general aptitude. This analysis helps future aspirants in understanding exam trends, preparing effectively, and managing time during the test. Below provided are the memory-based questions with solutions taken from students and compiled together:

Question 1

Which of the following drugs acts on the Renin-Angiotensin-Aldosterone System (RAAS)?
(A) Atenolol
(B) Furosemide
(C) Enalapril
(D) Digoxin
Correct Answer: (C) Enalapril
Explanation: Enalapril is an ACE inhibitor that inhibits the RAAS system, helping reduce blood pressure and manage heart failure.

Question 2

Entacapone and Tolcapone are which type of enzyme inhibitors?
(A) MAO-B inhibitors
(B) COMT inhibitors
(C) Acetylcholinesterase inhibitors
(D) DOPA decarboxylase inhibitors
Correct Answer: (B) COMT inhibitors
Explanation: These drugs inhibit catechol-O-methyltransferase (COMT), enhancing the effect of levodopa in Parkinson’s disease.

Question 3

Bevacizumab is a type of inhibitor.
(A) Tyrosine kinase inhibitor
(B) VEGF inhibitor
(C) Protease inhibitor
(D) COX inhibitor
Correct Answer: (B) VEGF inhibitor
Explanation: Bevacizumab is a monoclonal antibody that inhibits vascular endothelial growth factor (VEGF), used in cancer therapy.

Question 4

Which of the following drugs is classified as an ACE inhibitor?
(A) Losartan

(B) Enalapril
(C) Spironolactone
(D) Amlodipine
Correct Answer: (B) Enalapril
Explanation: Enalapril is an angiotensin-converting enzyme inhibitor that helps control blood pressure by blocking RAAS.

Question 5

Which of the following is a DPP-4 inhibitor?
(A) Glibenclamide
(B) Sitagliptin
(C) Metformin
(D) Acarbose
Correct Answer: (B) Sitagliptin
Explanation: Sitagliptin inhibits dipeptidyl peptidase-4 (DPP-4), increasing incretin levels and improving glucose control in type 2 diabetes.

Question 6

What is the mechanism of action of Gleevec (Imatinib)?
(A) Monoclonal antibody against EGFR
(B) DNA alkylating agent
(C) Tyrosine kinase inhibitor targeting BCR-ABL
(D) Microtubule destabilizer
Correct Answer: (C) Tyrosine kinase inhibitor targeting BCR-ABL
Explanation: Imatinib inhibits the BCR-ABL fusion protein's tyrosine kinase activity in chronic myeloid leukemia (CML).

Question 7

Which of the following drugs is commonly used to treat MRSA infections?
(A) Amoxicillin
(B) Vancomycin
(C) Ceftriaxone
(D) Metronidazole
Correct Answer: (B) Vancomycin
Explanation: Vancomycin is a glycopeptide antibiotic effective against MRSA (Methicillin-Resistant *Staphylococcus aureus*).

Question 8

Sodium-potassium pump follows which type of transport mechanism?
(A) Simple diffusion
(B) Facilitated diffusion
(C) Primary active transport
(D) Secondary active transport
Correct Answer: (C) Primary active transport

Explanation: The Na^+/K^+ pump uses ATP to actively transport ions against their concentration gradients.

Question 9

Which of the following drugs exhibits zero-order kinetics at high or toxic doses?
(A) Paracetamol
(B) Aspirin
(C) Amoxicillin
(D) Metformin
Correct Answer: (B) Aspirin
Explanation: At high doses, aspirin follows zero-order kinetics, meaning the rate of elimination is constant regardless of concentration.

Question 10

What is the primary cause of Myasthenia Gravis?
(A) Genetic mutation in muscle cells
(B) Bacterial infection of the nervous system
(C) Autoimmune destruction of acetylcholine receptors
(D) Deficiency of dopamine in the brain
Correct Answer: (C) Autoimmune destruction of acetylcholine receptors
Explanation: Myasthenia Gravis is an autoimmune disorder where antibodies target and degrade nicotinic acetylcholine receptors at neuromuscular junctions.

Question 11

Levodopa : Carbidopa :: Imipenem : ?
(A) Metronidazole
(B) Clavulanic acid
(C) Cilastatin
(D) Sulbactam
Correct Answer: (C) Cilastatin
Explanation: Cilastatin inhibits renal dehydropeptidase, preventing degradation of Imipenem, just as Carbidopa enhances Levodopa.

Question 12

Which of the following is a biological product?
(A) Betamethasone
(B) Retinoic acid
(C) Cyanocobalamin
(D) Paracetamol
Correct Answer: (C) Cyanocobalamin
Explanation: Cyanocobalamin (Vitamin B12) is biologically derived and considered a biological product.

Question 13

Asthma is treated with:
(A) β1 agonist
(B) β2 agonist
(C) α agonist
(D) Muscarinic antagonist
Correct Answer: (B) β2 agonist
Explanation: β2 agonists like salbutamol dilate bronchi and are the first-line treatment for asthma relief.

Question 14

Which hormone is commonly released during short-term stress?
(A) Insulin
(B) Adrenaline
(C) Glucagon
(D) Estrogen
Correct Answer: (B) Adrenaline
Explanation: Adrenaline (epinephrine) is released by the adrenal medulla in response to acute stress.

Question 15

What is the current term used in medical literature for "Mental Retardation"?
(A) Mental deficiency
(B) Cognitive delay
(C) Intellectual disability
(D) Mental impairment
Correct Answer: (C) Intellectual disability
Explanation: "Intellectual disability" is the accepted and respectful clinical term used instead of the outdated "mental retardation."

Question 16

Myxedema coma is a severe complication of which condition?
(A) Hyperthyroidism
(B) Hypothyroidism
(C) Cushing's syndrome
(D) Addison's disease
Correct Answer: (B) Hypothyroidism
Explanation: Myxedema coma is a life-threatening emergency resulting from severe hypothyroidism.

Question 17

Which of the following is a common symptom of PCOD?
(A) Heavy menstrual bleeding
(B) Pain during ovulation
(C) Irregular menstrual cycle

(D) Early menopause
Correct Answer: (C) Irregular menstrual cycle
Explanation: Polycystic ovarian disease often causes menstrual irregularities due to hormonal imbalance.

Question 18

Which of the following is a sex-linked disorder?
(A) Huntington's disease
(B) Hemophilia
(C) Cystic fibrosis
(D) Thalassemia
Correct Answer: (B) Hemophilia
Explanation: Hemophilia is an X-linked recessive disorder more commonly seen in males.

Question 19

Sodium Cromoglycate is used as:
(A) Bronchodilator
(B) Mast cell stabilizer
(C) Antihistamine
(D) Corticosteroid
Correct Answer: (B) Mast cell stabiliser
Explanation: Sodium cromoglycate prevents mast cell degranulation and is used prophylactically in asthma.

Question 20

The first drug launched under the 'Kalakar' health initiative is:
(A) Kalawantine
(B) Paracetamol
(C) Cough syrup
(D) Diclofenac
Correct Answer: (A) Kalawantine
Explanation: Kalawantine was launched as a welfare medicine under the 'Kalakar' health initiative aimed at artist healthcare in India.

Question 21

Montelukast acts on which of the following receptors to block the action of leukotrienes LTC4 and LTD4?
(A) CysLT1 receptor
(B) H2 receptor
(C) CB2 receptor
(D) Muscarinic receptor
Correct Answer: (A) CysLT1 receptor

Explanation: Montelukast is a leukotriene receptor antagonist that specifically blocks the CysLT1 receptor, reducing inflammation in asthma.

Question 22

Ethambutol acts via inhibiting:
(A) Protein synthesis
(B) Mycolic acid synthesis
(C) Cell wall synthesis
(D) DNA
Correct Answer: (C) Cell wall synthesis
Explanation: Ethambutol inhibits arabinosyl transferases involved in mycobacterial cell wall synthesis.

Question 23

Longest acting insulin:
(A) Glargine
(B) Lispro
(C) Detemir
(D) Aspart
Correct Answer: (A) Glargine
Explanation: Insulin glargine is a long-acting basal insulin with a duration of action up to 24 hours.

Question 24

Alzheimer's disease is caused by:
(A) Beta amyloid accumulation
(B) Decreased dopamine
(C) Decreased acetylcholine
(D) Both A and C
Correct Answer: (D) Both A and C
Explanation: Alzheimer's is associated with beta-amyloid plaque formation and decreased levels of acetylcholine in the brain.

Question 25

mTOR inhibitor is:
(A) Sirolimus
(B) Cycloserine
(C) Tacrolimus
(D) Anakinra
Correct Answer: (A) Sirolimus
Explanation: Sirolimus inhibits the mammalian target of rapamycin (mTOR), used in immunosuppressive therapy.

Question 26

Digoxin poisoning is treated with:
(A) Magnesium sulfate
(B) Protamine sulfate
(C) Flumazenil
(D) Digoxin immune Fab
Correct Answer: (D) Digoxin immune Fab
Explanation: Digoxin-specific antibody fragments (Fab) are used to bind and neutralize digoxin in case of toxicity.

Question 27

Symptoms of muscarinic poisoning include:
(A) Tachycardia
(B) Hypotension
(C) Dry mouth
(D) Constipation
Correct Answer: (B) Hypotension
Explanation: Muscarinic poisoning causes parasympathetic overactivity—hypotension, bradycardia, sweating, and excessive salivation.

Question 28

Which of the following is *not* obtained from animals?
(A) Heparin
(B) Captopril
(C) Erythromycin
(D) Premarin
Correct Answer: (B) Captopril
Explanation: Captopril is a synthetic drug inspired by a snake venom peptide but is not directly derived from animals.

Question 29

In which drug therapy is body surface area (BSA)-based dose adjustment required?
(A) Chemotherapy
(B) Antibiotics
(C) Antipyretics
(D) Anti-inflammatories
Correct Answer: (A) Chemotherapy
Explanation: Chemotherapy dosages are often calculated based on BSA to improve efficacy and reduce toxicity.

Question 30

Hormone released from the zona glomerulosa:
(A) Aldosterone
(B) Mineralocorticoid

(C) Adrenaline
(D) Dopamine
Correct Answer: (A) Aldosterone
Explanation: The zona glomerulosa of the adrenal cortex secretes aldosterone, which regulates sodium and water balance.

Question 31

Which of the following is produced by a biological system?
(A) Toxin
(B) Toxicant
(C) Poison
(D) Xenobiotics
Correct Answer: (A) Toxin
Explanation: A toxin is a harmful substance produced naturally by living organisms, unlike toxicants which are man-made.

Question 32

Syphilis is caused by which microorganism?
(A) Entamoeba histolytica
(B) Plasmodium falciparum
(C) Treponema pallidum
(D) Brucella spp.
Correct Answer: (C) Treponema pallidum
Explanation: Treponema pallidum is a spirochete bacterium that causes syphilis, a sexually transmitted infection.

Question 33

Which neurotransmitter is formed by glutamate decarboxylation?
(A) Dopamine
(B) GABA
(C) Glutamine
(D) Glycine
Correct Answer: (B) GABA
Explanation: GABA (gamma-aminobutyric acid) is synthesized from glutamate by the enzyme glutamate decarboxylase.

Question 34

Where does primary absorption of drugs occur?
(A) Stomach
(B) Small intestine
(C) Large intestine
(D) Liver
Correct Answer: (B) Small intestine

Explanation: The small intestine is the primary site of drug absorption due to its large surface area and rich blood supply.

Question 35

What is Megaloblastic Anemia?
(A) Caused by iron deficiency
(B) Caused by the destruction of red blood cells
(C) Caused by a deficiency of vitamin B_{12}
(D) Due to chronic blood loss
Correct Answer: (C) Caused by deficiency of vitamin B_{12}
Explanation: Megaloblastic anemia results from impaired DNA synthesis due to vitamin B_{12} or folate deficiency.

Question 36

Which is a prodrug and is converted to nitric oxide?
(A) Nitroglycerin
(B) Amyl nitrite
(C) Pentaerythritol
(D) All of the above
Correct Answer: (D) All of the above
Explanation: All listed options are nitrates or nitrites that release nitric oxide, a potent vasodilator, upon metabolism.

Question 37

Which among the following doesn't contain anethole?
(A) Fennel
(B) Anise
(C) Holy Basil
(D) All of the above
Correct Answer: (C) Holy Basil
Explanation: Anethole is a major component in fennel and anise oils, but not in holy basil (Ocimum sanctum), which contains eugenol instead.

Question 38

Father of chemotherapy:
(A) Paul Ehrlich
(B) Hippocrates
(C) Galen
(D) Ramnath Chopra
Correct Answer: (A) Paul Ehrlich
Explanation: Paul Ehrlich is credited as the father of chemotherapy due to his work in developing the first antimicrobial drug—Salvarsan.

Question 39

For which of the following alkaloids is Mayer's test negative but Murexide test positive?
(A) Indole alkaloid
(B) Isoquinoline alkaloid
(C) Purine alkaloid
(D) Tropane alkaloid
Correct Answer: (C) Purine alkaloid
Explanation: Purine alkaloids like caffeine do not respond to Mayer's test but give a positive Murexide test (purplish colour).

Question 40

Which antibody is first produced against an antigen?
(A) IgG
(B) IgA
(C) IgM
(D) IgE
Correct Answer: (C) IgM
Explanation: IgM is the first antibody produced during a primary immune response and is pentameric in nature.

Question 41

Which amino acid does not occur naturally?
(A) Histidine
(B) Phenylephrine
(C) Arginine
(D) Aspartic acid
Correct Answer: (B) Phenylephrine
Explanation: Phenylephrine is a synthetic drug, not a naturally occurring amino acid.

Question 42

Find the odd one out:
(A) Retina
(B) Pupil
(C) Vision
(D) Cornea
Correct Answer: (C) Vision
Explanation: All other options are anatomical parts of the eye, while "vision" is a physiological function.

Question 43

Choose the correct spelling:
(A) Ocassion
(B) Occasion
(C) Occassion

(D) Ocacsion
Correct Answer: (B) Occasion
Explanation: The correct spelling of the word is "Occasion".

Question 44

Choose the correct spelling:
(A) Surveilance
(B) Survillance
(C) Surveillance
(D) Surveillance
Correct Answer: (C) Surveillance
Explanation: "Surveillance" is correctly spelled in option (C). Option (D) repeats it.

Question 45

Choose the correct synonym of the word "August":
(A) Ordinary
(B) Humble
(C) Majestic
(D) Common
Correct Answer: (C) Majestic
Explanation: “August” means inspiring reverence or admiration; majestic; dignified.

Question 46

Choose the correct synonym of the word "Exaggerate":
(A) Minimize
(B) Understate
(C) Amplify
(D) Reduce
Correct Answer: (C) Amplify
Explanation: "Exaggerate" means to amplify or overstate something.

Question 47

A person who studies birds is called:
(A) Entomologist
(B) Ornithologist
(C) Herpetologist
(D) Ichthyologist
Correct Answer: (B) Ornithologist
Explanation: An ornithologist studies birds. Entomologists study insects, herpetologists study reptiles, and ichthyologists study fish.

Question 48

The study of Earth is called:
(A) Geology
(B) Ecology
(C) Astrology
(D) Meteorology
Correct Answer: (A) Geology
Explanation: Geology is the scientific study of the Earth's structure, substances, history, and processes.

Question 49

Fill in the blank with the suitable word: Modern technologies should _____ at least match new technology.
(A) With
(B) Of
(C) In
(D) Was
Correct Answer: (C) In
Explanation: "Modern technologies should **in** at least match new technology" is the grammatically and contextually correct choice.

Question 50

Least number to be subtracted from 9999 so that it is completely divisible by 19:
(A) 5
(B) 6
(C) 4
(D) 3
Correct Answer: (C) 4
Explanation: 9999 ÷ 19 gives a remainder of 4. So, subtracting 4 will make it divisible by 19.

Question 51

Find the word with the incorrect spelling:
(A) Penance
(B) Menace
(C) Tendancy
(D) Governance
Correct Answer: (C) Tendancy
Explanation: The correct spelling is "Tendency".

Question 52

Replace the bold phrase to make the sentence grammatically correct: "The man to who I sold my house was a cheat."
(A) to whom I sell
(B) to who I sell

(C) who was sold to
(D) to whom I sold
Correct Answer: (D) to whom I sold
Explanation: "To whom I sold" is the grammatically correct phrase, as “whom” is used as the object of the preposition “to”.

Question 53

Choose the correct alternative for the underlined word: “All over Russia, Indian films are more popular than those in any other country.”
(A) in
(B) that in
(C) that of
(D) those of
Correct Answer: (D) those of
Explanation: “Those of” correctly refers to plural noun “films” from other countries for comparison.

Question 54:

Find the angle at 5:00 PM.

(a) 30°
(b) 60°
(c) 150°
(d) 90°

Correct Answer: (c)

Explanation:
At 5:00 PM, the minute hand is at 12 and the hour hand is at 5.
Each hour mark represents 30° (since 360° ÷ 12 = 30°).
So, the hour hand at 5 is at:
5 × 30 = 150°
The minute hand is at 0°.
Therefore, the angle between them is:
|150° − 0°| = 150°

Question 55: What comes next in the series: 2, 6, 18, 54, ?
(a) 30
(b) 60
(c) 162
(d) 190
Correct Answer: (c)
Explanation: Each term is multiplied by 3: 2×3 = 6, 6×3 = 18, 18×3 = 54, 54×3 = 162.

Question 56: G20 Summit 2024 was held in:
(a) USA

(b) India
(c) Brazil
(d) China
Correct Answer: (c) Brazil

Question 57: "Philistine" refers to someone who:
(a) They wear full dress and all
(b) They drink alcohol
(c) They lack cultural refinement
(d) They avoid social gatherings
Correct Answer: (c)

Question 58: Myokines are:
(a) Proteins released by muscle cells
(b) They drink alcohol
(c) Men who oppress women
(d) People who avoid social gatherings
Correct Answer: (a)
Explanation: Myokines are cytokines produced and released by muscle fibers through contraction.

Question 59: The 4f orbital belongs to which block in the periodic table?
(a) s-block
(b) p-block
(c) d-block
(d) f-block
Correct Answer: (d)

Question 60: Wolff–Kishner reaction is used for:
(a) Oxidation of alcohols to ketone
(b) Reduction of alkenes to alkane
(c) Conversion of aldehydes and ketones to alkanes
(d) Halogenation of aromatic compounds
Correct Answer: (c)

Question 61: Which of the following gives a positive Tollen’s test?
(a) Ethanal
(b) Methanal
(c) Ethanol
(d) Glucose
Correct Answer: (b) Methanal
Explanation: Methanal (formaldehyde) is a reducing agent and gives a positive Tollen's test.

Question 62: Which of the following correctly represents the order of basicity?
(a) Pyridine > Imidazole > Pyrrole
(b) Imidazole > Pyridine > Pyrrole

(c) Pyrrole > Pyridine > Imidazole
(d) Imidazole > Pyrrole > Pyridine
Correct Answer: (b)

Question 63: Which of the following compounds is most basic?
(a) Acetic acid
(b) Phenol
(c) p-Nitrophenol
(d) o-Nitrophenol
Correct Answer: (b) Phenol
Explanation: Although weak, phenol is more basic than nitrophenols due to the electron-withdrawing nitro group decreasing basicity.

Question 64: Which of the following forms a white precipitate of silver halide?
(a) NaCl
(b) NaOH
(c) Na2CO3Na_2CO_3
(d) CH3COONaCH_3COONa
Correct Answer: (a) NaCl
Explanation: NaCl reacts with $AgNO_3$ to form a white precipitate of AgCl.

Question 65: Combustion of natural gas is which type of reaction?
(a) Exothermic
(b) Endothermic
(c) Displacement
(d) Neutralization
Correct Answer: (a)

Question 66: Which metal is present in Vitamin B_{12}?
(a) Iron
(b) Magnesium
(c) Cobalt
(d) Zinc
Correct Answer: (c)

Question 67: Which of the following contains a pyridine ring?
(a) Paracetamol
(b) Isoniazid
(c) Aspirin
(d) Ibuprofen
Correct Answer: (b)

Question 68: According to the n+1n+1 rule, 3,3-dibromoethane will show which type of splitting in NMR?
(a) Singlet
(b) Doublet
(c) Triplet

(d) Quartet
Correct Answer: (a)
Explanation: No neighboring protons → Singlet.

Question 69: Which of the following does NOT give iodoform test?
(a) Ethanol
(b) Acetone
(c) Isopropanol
(d) Methanol
Correct Answer: (d)

Question 70: IUPAC name of Br2C−C≡C−CH3Br_2C - C \equiv C - CH_3:
(a) 2,2-Dibromo-1-butyne
(b) 1,1-Dibromo-2-butyne
(c) 1,2-Dibromo-3-butene
(d) 3,3-Dibromo-1-butene
Correct Answer: (a)

Question 71: Which is *not* a detector in Gas Chromatography?
(a) FID
(b) ECD
(c) TCD
(d) Array diode detector
Correct Answer: (d)

Question 72: Beer–Lambert law is used in:
(a) UV-Visible spectroscopy
(b) IR spectroscopy
(c) NMR spectroscopy
(d) Mass spectroscopy
Correct Answer: (a)

Question 73: Aldol condensation reactivity order for:
I. Benzaldehyde
II. p-Methoxybenzaldehyde
III. p-Nitrobenzaldehyde
IV. Formaldehyde
(a) I > II > III > IV
(b) I > III > II > IV
(c) IV > II > III > I
(d) IV ≥ I ≥ II ≥ III
Correct Answer: (c)

Question 74: Which group will show a red shift (bathochromic shift)?
(a) NHCOCH3NHCOCH_3
(b) C=OC=O
(c) Cl

(d) All of the above
Correct Answer: (d)

Question 75: Which is the method to determine enantiomeric excess (ee)?
(a) UV spectroscopy
(b) IR spectroscopy
(c) NMR spectroscopy
(d) Polarimetry
Correct Answer: (d)

Question 76: Pinacol-pinacolone rearrangement converts:
(a) 1,2-diol
(b) 1,1-diol
(c) 1,3-diol
(d) 1,4-diol
Correct Answer: (a)

Question 77: Albinism is associated with which amino acid?
(a) Tyrosine
(b) Phenylalanine
(c) Tryptophan
(d) Histidine
Correct Answer: (a)

Question 78:
Wetting reaction in dental materials refers to:
(a) Chemical setting of materials
(b) The ability of a liquid to spread over a surface
(c) Hardening of composite resins
(d) Thermal expansion of materials
Correct Answer: (b)
Explanation: Wetting is the ability of a liquid (like saliva or bonding agent) to spread across a surface, which is crucial for adhesion in dental materials.

Question 79:
The HLB (Hydrophilic-Lipophilic Balance) value of antifoaming agents is:
(a) 1–3
(b) 4–6
(c) 8–18
(d) Above 20
Correct Answer: (a)
Explanation: Antifoaming agents have low HLB values (1–3), indicating they are more lipophilic.

Question 80:
BCS (Biopharmaceutics Classification System) Class II drugs are characterized by:
(a) High solubility, high permeability

(b) Low solubility, low permeability
(c) Low solubility, high permeability
(d) High solubility, low permeability
Correct Answer: (c)
Explanation: BCS Class II drugs have low solubility and high permeability, so their absorption is limited by the rate of dissolution.

Question 81:
FSSAI (Food Safety and Standards Authority of India) works under which ministry?
(a) Ministry of Agriculture
(b) Ministry of Health and Family Welfare
(c) Ministry of Consumer Affairs
(d) Ministry of Food Processing Industries
Correct Answer: (b)
Explanation: FSSAI is an autonomous body under the Ministry of Health and Family Welfare, Government of India.

Question 82:
Schedule O relates to:
(a) Standards for cosmetics
(b) Standards for disinfectants
(c) Standards for ophthalmic preparations
(d) Standards for parenteral preparations
Correct Answer: (b)
Explanation: Schedule O of the Drugs and Cosmetics Rules deals with the standards for disinfectants.

Question 83:
Talc is used as:
(a) Binder
(b) Diluent
(c) Disintegrant
(d) Preservative
Correct Answer: (b)
Explanation: Talc is commonly used as a diluent or glidant in tablet formulations.

Question 84:
Which of the following does **not** describe Microcrystalline Cellulose (MCC)?
(a) Non-fibrous
(b) Slightly soluble in water
(c) Used as disintegrant
(d) Insoluble in water
Correct Answer: (b)
Explanation: MCC is insoluble in water. It is fibrous and used primarily as a disintegrant and binder.

Question 85:
According to IP, which of the following can be used as a co-solvent?
(a) Acetone
(b) Water
(c) Glycerin
Correct Answer: (c)
Explanation: Glycerin is a commonly used co-solvent in pharmaceutical formulations.

Question 86:
The relative sweetness of saccharin compared to sucrose is approximately:
(a) 200 times
(b) 400 times
(c) 500 times
(d) 1000 times
Correct Answer: (c)
Explanation: Saccharin is about 300–500 times sweeter than sucrose.

Question 87:
Benzyl alcohol as a preservative is **not** typically used in injections for which group?
(a) Adults
(b) Children
(c) Elderly
(d) Pregnant women
Correct Answer: (b)
Explanation: Benzyl alcohol is contraindicated in neonates and young children due to the risk of "gasping syndrome."

Question 88:
A drug with a high volume of distribution exhibits:
(a) High solubility
(b) Lipophilicity
(c) Extensive distribution to tissues
Correct Answer: (c)
Explanation: A high volume of distribution means the drug distributes extensively into tissues rather than remaining in plasma.

Question 89:
Contact lenses are typically made from:
(a) Polystyrene
(b) Polyvinyl chloride (PVC)
(c) Silicone hydrogel
(d) Polymethyl methacrylate (PMMA)
Correct Answer: (c)
Explanation: Silicone hydrogel is widely used for soft contact lenses due to its high oxygen permeability.

Question 90:
"Orange peel effect" is shown during which phase?
(a) Blending
(b) Coating
(c) Polishing
(d) Drying
Correct Answer: (b)
Explanation: The orange peel effect is a coating defect resembling the surface of an orange due to improper spray parameters.

Question 91:
Sublimation in lyophilisation occurs at which stage?
(a) Pre-treatment
(b) Primary drying
(c) Secondary drying
(d) Freezing
Correct Answer: (b)
Explanation: Sublimation of ice to vapour occurs during the **primary drying** phase in lyophilisation.

Question 92:
Which technique is used to determine surface area and pore structure of pharmaceutical powders?
(a) Quantasorb
(b) Anderson pipette
(c) Optical microscopy
Correct Answer: (a)
Explanation: The Quantasorb technique uses gas adsorption to determine surface area and pore structure.

Question 93:
The solubility enhancement of caffeine by sodium benzoate is an example of:
(a) Hydrotropy
(b) Complexation
(c) Co-solvency
(d) Solubilization
Correct Answer: (a)
Explanation: Hydrotropy is the phenomenon of increasing solubility using hydrotropic agents like sodium benzoate.

Question 94:
Calculate the angle of repose (θ) if the height (h) is 3.3 cm and the diameter (d) is 9 cm.

(a) 36.25°
(b) 36.15°
(c) 26.25°
(d) 26.15°

Correct Answer: (a)

Explanation:
The angle of repose is given by the formula:
$\theta = \tan^{-1}(2h / d)$

Substituting the values:
$\theta = \tan^{-1}(2 \times 3.3 / 9) = \tan^{-1}(0.733)$

$\theta \approx 36.25°$

Question 95:
Where does primary absorption of a drug occur?
(a) Stomach
(b) Small intestine
(c) Large intestine
Correct Answer: (b)
Explanation: The small intestine is the primary site for drug absorption due to its large surface area and rich blood supply.

Question 96:
Maillard reaction occurs between:
(a) Amine and lactose
(b) Protein and sugar
(c) Amino acid and glucose
(d) Protein and enzyme
Correct Answer: (c)
Explanation: The Maillard reaction involves a reducing sugar (like glucose) and an amino acid, forming brown pigments (non-enzymatic browning).

Question 97:
Tablets adhesion to the die wall during tablet compression is called:
(a) Picking
(b) Sticking
(c) Capping
(d) Lamination
Correct Answer: (b)
Explanation: *Sticking* is when tablet material adheres to the die wall or punch face during compression.

Question 98:
Bloom strength is a measure of the strength of which polymer?
(a) Gelatin
(b) Starch
(c) Cellulose
(d) Polyvinylpyrrolidone (PVP)

Correct Answer: (a)
Explanation: Bloom strength indicates the firmness or gel strength of gelatin; higher values mean stronger gels.

Question 99:
As per I.P., if the solubility range of a solute is 1 to 10 parts, it is classified as:
(a) Soluble
(b) Freely soluble
(c) Sparingly soluble
(d) Slightly soluble
Correct Answer: (a)
Explanation: According to Indian Pharmacopoeia, 1–10 parts of solvent indicates the substance is *soluble*.

Question 100:
A higher Hausner ratio indicates:
(a) Excellent flow
(b) Good flow
(c) Passable flow
(d) Poor flow
Correct Answer: (d)
Explanation: Hausner ratio > 1.25 suggests poor flowability of the powder.

Question 101:
What is the isoelectric point if pKa1 = 2.18 and pKa2 = 8.85?
(a) 0.92
(b) 4
(c) 9.87
(d) 5.5
Correct Answer: (d)
Explanation: Isoelectric point (pI) for amino acids =

$(pKa_1 + pKa_2) / 2 = (2.18 + 8.85) / 2 = 5.515$

Question 102:
Sedimentation is directly proportional to:
(a) Surface Area
(b) Viscosity
(c) Density
(d) Volume
Correct Answer: (c)
Explanation: According to Stokes' Law, the sedimentation rate increases with the density difference between particles and the medium.

Question 103:
The unit of a first-order reaction is:
(a) sec^{-1}

(b) Mole litre sec
(c) Mole sec^{-1}
(d) $Mole^{-1}$

Correct Answer: (a)

Explanation: The rate constant of a first-order reaction has units of inverse time, i.e., sec^{-1}.

Question 104:
Fick's law is used for the study of:
(a) Dissolution rate
(b) Disintegration rate
(c) Dissociation rate
(d) Passive diffusion
Correct Answer: (d)
Explanation: Fick's Law describes the passive diffusion of molecules across membranes.

Question 105:
Coating of Eudragit NE40D on tablets is done to prepare:
(a) Buccal tablets
(b) Sublingual tablets
(c) CR tablets
(d) IR tablets
Correct Answer: (c)
Explanation: Eudragit NE40D is used for controlled-release (CR) coating due to its sustained-release properties.

Question 106:
Which ICH guideline provides stability requirements for new drug substances?
(a) Q1A
(b) Q1B
(c) Q1C
Correct Answer: (a)
Explanation: ICH Q1A provides guidelines for stability testing of new drug substances and products under various environmental conditions.

Question 107:
Which is the final electron acceptor in the electron transport chain?
Options:
A. Oxygen
B. ATP
C. Cytochrome
D. FAD
Correct Option: A

Explanation: Oxygen is the final electron acceptor in the electron transport chain, combining with electrons and protons to form water.

Question 108:
Which metal is present in Vitamin B_{12}?
Options:
A. Manganese
B. Ferric (Fe)
C. Cobalt
D. Copper
Correct Option: C
Explanation: Vitamin B_{12} (Cobalamin) contains cobalt at the center of its corrin ring.

Question 109:
Protein responsible for maintaining osmotic (oncotic) pressure in the body is:
Options:
A. Heparin
B. Albumin
C. Globulin
D. Fibrinogen
Correct Option: B
Explanation: Albumin helps regulate oncotic pressure and maintains fluid balance in the blood.

Question 110:
Most abundant protein in the human body is:
Options:
A. Collagen
B. Hemoglobin
C. Albumin
D. Keratin
Correct Option: A
Explanation: Collagen is the most abundant structural protein found in connective tissues.

Question 111:
Orthopedic transplants are primarily made of which of the following materials?
Options:
A. Silicone
B. Titanium alloy
C. Polystyrene
D. Teflon
Correct Option: B
Explanation: Titanium alloy is used in orthopedic implants due to its strength, light weight, and biocompatibility.

Question 112:
Heart valve transplants are commonly made of which of the following materials?
Options:
A. Silicone rubber
B. Stainless steel
C. Carbon
D. Polyethylene glycol
Correct Option: C
Explanation: Pyrolytic carbon is used in mechanical heart valves for its durability and biocompatibility.

Question 113:
Protein responsible for osmolarity balance in the body:
Options:
A. Heparin
B. Albumin
C. Globulin
D. Collagen
Correct Option: B
Explanation: Albumin helps maintain osmotic pressure and is the major protein in plasma contributing to osmolarity.

Question 114:
Atropine mechanism of action:
Options:
A. Muscarinic antagonist
B. Neuromuscular agonist
C. Neuromuscular antagonist
D. Ganglionic blocker
Correct Option: A
Explanation: Atropine is a muscarinic receptor antagonist that blocks the parasympathetic nervous system.

Question 115:
First antimalarial drug:
Options:
A. Chloroquine
B. Quinine
C. Artemisinin
D. Amodiaquine
Correct Option: B
Explanation: Quinine, derived from Cinchona bark, was the first antimalarial drug discovered.

Question 116:
Caffeine and theophylline cause CNS stimulation by:

Options:
A. Adenosine receptor antagonist
B. NMDA
C. GABA receptor agonist
D. Acetylcholinesterase
Correct Option: A
Explanation: They block adenosine receptors, preventing drowsiness and leading to CNS stimulation.

Question 117:
Drug of choice (DOC) for cerebral malaria:
Options:
A. Artemisinin
B. Chloroquine intravenous
C. Primaquine
D. Quinine oral
Correct Option: A
Explanation: Intravenous artesunate (an artemisinin derivative) is the DOC for cerebral malaria.

Question 118:
SERM full form in chemotherapy:
Options:
A. Selective Estrogen Receptor Modulators
B. Selective Estrogen Receptor Medication
C. Systemic Estrogen Receptor Management
D. Specific Estrogen Receptor Molecule
Correct Option: A
Explanation: SERMs are compounds that selectively stimulate or inhibit estrogen receptors depending on the tissue type.

Question 119:
Quinine is obtained from which of the following?
Options:
A. Cinchona
B. Camptotheca
C. Ipecac
D. Opium
Correct Option: A
Explanation: Quinine is an alkaloid derived from the bark of the Cinchona tree.

Question 120:
Which drug is obtained from a marine source?
Options:
A. Agar-agar
B. Cassia angustifolia

C. Cantharide
D. Asbestos
Correct Option: A
Explanation: Agar-agar is a polysaccharide derived from red algae, a marine source.

Question 121:
Which receptor acts by phosphorylation?
Options:
A. GPCR
B. Tyrosine Kinase
C. Nuclear
D. Ion Channel
Correct Option: B
Explanation: Tyrosine kinase receptors signal via phosphorylation of tyrosine residues.

Question 122:
Rancidity of oil is detected by:
Options:
A. Iodine value
B. Saponification value
C. Peroxide value
D. Acetyl value
Correct Option: C
Explanation: Peroxide value measures the extent of oxidation in fats/oils and is used to detect rancidity.

NIPER JEE Previous Year Question Paper With Solutions: Subject Highlights

This eBook is tailored for aspirants of the NIPER JEE, an entrance exam that tests your knowledge in core pharmaceutical sciences. The subjects covered include:

- Chemistry
- Pharmacology
- Biotechnology
- Pharmaceutical Analysis
- Aptitude and General Knowledge

Each subject section features important topics that are frequently asked in the exam. Practicing these questions in the year 2024, 2022, 2020 and 2019 will help you get familiar with the exam style, identify important chapters, and focus your revision on high-yield areas.

Regular practice with these papers will not only improve your problem-solving speed but also help you manage your time better and get accustomed to the actual difficulty level of the exam. By solving these question papers, you can pinpoint your strengths and weaknesses, allowing you to optimize your study plan. Most importantly, practicing previous year papers

boosts your confidence and reduces exam anxiety as you become comfortable with the question patterns.

Below we have provided the NIPER JEE Questions with Solutions for the year 2024, 2022, 2020 and 2019:

NIPER 2024 QUESTION PAPER WITH SOLUTIONS

Q.1 Inulin is a polymer of:

A) Mannose
B) Glucose
C) Fructose
D) Amino

Answer: The correct option is (C) Fructose

Explanation:
Inulin is a polysaccharide composed primarily of fructose units. It is a storage carbohydrate found in many plants, especially in the roots of chicory and Jerusalem artichoke. It's used as a dietary fibre and prebiotic.

Question 2:
Which of the following shows predominant withdrawal hypertension?
A) Guanethidine
B) Losartan
C) Clonidine
D) Propranolol
Answer: The correct option is C. Clonidine
Explanation: Clonidine, when abruptly discontinued, causes rebound hypertension due to sympathetic overactivity.

Question 3:
The medical device import license can be obtained by filling and submitting which form to the CDSCO?
A) Form MD-17
B) Form MD-16
C) Form MD-15
D) Form MD-14
Answer: The correct option is C. Form MD-15
Explanation: As per the Medical Devices Rules, 2017, Form MD-15 is used for importing medical devices in India.

Question 4:
The nature of ring in Metaraminol is:
A) Phenol
B) Catechol
C) Resorcinol
D) Galol

Answer: The correct option is B. Catechol
Explanation: Metaraminol contains a catechol ring similar to norepinephrine, which contributes to its sympathomimetic action.

Question 5:
To treat the methanol poisoning in patient, ethanol is administered intravenously. It is a _____ of alcohol dehydrogenase.
A) Uncompetitive inhibitor
B) Allosteric inhibition
C) Competitive inhibitor
D) Noncompetitive inhibition
Answer: The correct option is C. Competitive inhibitor
Explanation: Ethanol competes with methanol for alcohol dehydrogenase, preventing toxic metabolites like formic acid.

Question 6:
mRNA-based COVID-19 vaccine with trade name Spikevax is manufactured by:
A) Moderna
B) Serum Institute of India
C) AstraZeneca
D) Zydus Cadila
Answer: The correct option is A. Moderna
Explanation: Spikevax is the brand name for Moderna's mRNA-based COVID-19 vaccine.

Question 7:
A small enterprise is one in which the investment in plant and machinery is more than Rs ____ but does not exceed Rs ____.
A) 10 lakhs / 2 crores
B) 25 lakhs / 5 crores
C) 5 crores / 10 crores
D) 2 crores / 5 crores
Answer: The correct option is B. 25 lakhs / 5 crores
Explanation: As per the MSME Development Act, a small enterprise has an investment between ₹25 lakh and ₹5 crore.

Question 8:
Exposure to chemicals such as parabens, phenols, and phthalates in cosmetics is linked to:
A) Early onset of puberty among girls
B) Teratogenicity among girls in childbearing age
C) Carcinogenicity
D) Superinfections
Answer: The correct option is A. Early onset of puberty among girls
Explanation: These chemicals are endocrine disruptors and have been associated with early puberty.

Question 9:
$\log(a/b) + \log(b/a) = \log(a + b)$. Find the value of $(a + b)$.
A) $a \times b = 1$
B) $a + b = 0$

C) a + b = 10
D) a = b
Answer: The correct option is B. a + b = 0
Explanation: log(a/b) + log(b/a) = log(a) - log(b) + log(b) - log(a) = 0 ⇒ log(a + b) = 0 ⇒ a + b = 1, but that contradicts log rules unless a + b = 0.

Question 10:
The year of origin of ICH guidelines is:
A) 1970
B) 1991
C) 1971
D) 1990
Answer: The correct option is B. 1991
Explanation: The ICH (International Council for Harmonisation) was established in 1991 to harmonize drug regulatory standards.

Question 11:
Bleomycins are natural products acting as intercalating anticancer agents. Which part of the molecule is involved in intercalation?
A) Carbohydrate ring system
B) Pyrimidine ring
C) Imidazole ring
D) Bithiazole ring system
Answer: The correct option is D. Bithiazole ring system
Explanation: The bithiazole ring in bleomycin is the moiety responsible for intercalating with DNA, facilitating its anticancer activity.

Question 12:
Radius of circle is "r" and radius of another circle is "2r". What will be the ratio of areas of two circles?
A) 1:1
B) 1:2
C) 1:4
D) 1:8
Answer: The correct option is C. 1:4
Explanation: Area ∝ radius². So, ratio = $r^2 : (2r)^2 = 1 : 4$

Question 13:
In a population, the probability of a susceptible individual getting infected with SARS-CoV-2 is low when most individuals in the population become immune to this virus. This phenomenon is known as:
A) Innate immunity
B) Herd immunity
C) Active immunity
D) Adaptive immunity
Answer: The correct option is B. Herd immunity
Explanation: Herd immunity occurs when a large part of the population becomes immune, thus offering indirect protection to those not immune.

Question 14:
Monkeypox is caused by a:
A) Double-stranded DNA virus
B) Single-stranded DNA virus
C) Double-stranded RNA virus
D) Single-stranded RNA virus
Answer: The correct option is A. Double-stranded DNA virus
Explanation: Monkeypox virus belongs to the Orthopoxvirus genus and has a double-stranded DNA genome.

Question 15:
Microbial plastics are made from:
A) Polyhydroxyalkanoate
B) Polystyrene
C) Polyurethane
D) Polyvinyl chloride
Answer: The correct option is A. Polyhydroxyalkanoate
Explanation: PHAs are biodegradable plastics produced by microorganisms.

Question 16:
Which is the currency of highest value in the world this year?
A) American Dollar
B) Kuwaiti Dinar
C) British Pound
D) Euro
Answer: The correct option is B. Kuwaiti Dinar
Explanation: As of recent valuations, the Kuwaiti Dinar is considered the highest-valued currency globally.

Question 17:
G-proteins act as:
A) Signal transducers
B) Hormone receptors
C) Second messengers
D) Hormone carriers
Answer: The correct option is A. Signal transducers
Explanation: G-proteins transmit signals from various stimuli outside a cell to its interior.

Question 18:
Posterior pituitary glands secrete:
A) Serotonin
B) Oxytocin
C) Catecholamines
D) Follicle stimulating hormone
Answer: The correct option is B. Oxytocin
Explanation: The posterior pituitary stores and releases oxytocin and vasopressin (ADH).

Question 19:
Nonapeptide among the following is:

A) Insulin
B) Antidiuretic hormone
C) ACTH
D) Thyrotropin releasing hormone
Answer: The correct option is B. Antidiuretic hormone
Explanation: ADH is a nonapeptide consisting of 9 amino acids.

Question 20:
Biological source of Carrageenan is:
A) Chondrus crispus
B) Kappaphycus alvarezii
C) Eucheuma denticulatum
D) All of the above
Answer: The correct option is D. All of the above
Explanation: All listed red algae are known sources of Carrageenan.

Question 21:
Who discovered the function of ATP as an energy source?
A) Dale Henry
B) Yellapragada Subbarow
C) Edward Kendal
D) Best and Banting
Answer: The correct option is B. Yellapragada Subbarow
Explanation: Yellapragada Subbarow was one of the first to identify the role of ATP as an energy source in the body.

Question 22:
The first National Institute of Pharmaceutical Education and Research (NIPER) was established in:
A) 1990
B) 1995
C) 1998
D) 2000
Answer: The correct option is B. 1995
Explanation: NIPER Mohali was the first to be established in 1995 under the Ministry of Chemicals and Fertilizers.

Question 23:
The definition of Quality Risk Management is mentioned in ICH guidelines:
A) Q6
B) Q8
C) Q9
D) Q10
Answer: The correct option is C. Q9
Explanation: ICH Q9 covers the principles and examples of tools for quality risk management.

Question 24:
Which is the largest desert in India?

A) Thar Desert
B) Rann of Kutch
C) Barmer Desert
D) Vohra Desert
Answer: The correct option is A. Thar Desert
Explanation: The Thar Desert is the largest desert in India and one of the most populated deserts in the world.

Question 25:
A laxative is MOST likely to be used to manage a common adverse effect of which medication?
A) Piroxicam
B) Oxycodone
C) Cefalexin
D) Dexamethasone
Answer: The correct option is B. Oxycodone
Explanation: Opioids like oxycodone commonly cause constipation, for which laxatives are prescribed.

Question 26:
One-horned rhino is found in India in which state?
A) Kerala
B) Assam
C) Orissa
D) Punjab
Answer: The correct option is B. Assam
Explanation: The one-horned rhinoceros is primarily found in Assam, especially in Kaziranga National Park.

Question 27:
Which ion shows the least molar ion conductivity?
A) H^+
B) K^+
C) Li^+
D) NH_4^+
Answer: The correct option is C. Li^+
Explanation: Due to its high charge density and small size, Li^+ moves slowly, hence lower conductivity.

Question 28:
Disagree : Protest :: Agree :
A) Refuse
B) Pretext
C) Recommend
D) Refute
Answer: The correct option is C. Recommend
Explanation: The analogy matches the action following agreement, similar to recommending after agreeing.

Question 29:
Which of the following barbiturates is not ultra-short acting?
A) Methohexital
B) Thiamylal
C) Secobarbital
D) Thiopental
Answer: The correct option is C. Secobarbital
Explanation: Secobarbital is short-acting, not ultra-short acting like the others listed.

Question 30:
In differential pulse polarography, how many times is the current measured during the life time of the Hg drop?
A) One time
B) Two times
C) Four times
D) Continuously measured during the whole lifetime
Answer: The correct option is B. Two times
Explanation: In differential pulse polarography, current is measured twice for each pulse—before and after the pulse is applied.

Question 31:
The Clausius-Clapeyron equation is very useful in the field of:
A) Quantum chemistry
B) Thermodynamics
C) Molecular orbital theory
D) Kinetic theory of gases
Answer: The correct option is B. Thermodynamics
Explanation: The Clausius-Clapeyron equation relates vapor pressure and temperature, making it essential in thermodynamics.

Question 32:
Eject : Insert :: Advance :
A) Delay
B) Retreat
C) Recoil
D) Bounce
Answer: The correct option is B. Retreat
Explanation: The analogy is based on opposites—'eject' is the opposite of 'insert'; 'advance' is the opposite of 'retreat'.

Question 33:
Predominant form of glucose in solution is:
A) Glucofuranose
B) Glucopyranose
C) Acyclic form
D) Hydrated acyclic form
Answer: The correct option is B. Glucopyranose

Explanation: In aqueous solutions, glucose predominantly exists in the six-membered ring form—glucopyranose.

Question 34:
Who is/are the father(s) of modern physics?
A) Galileo Galilei
B) Sir Isaac Newton
C) Albert Einstein
D) All of the above
Answer: The correct option is D. All of the above
Explanation: All these scientists made foundational contributions to modern physics.

Question 35:
All are bioplastics except:
A) Polyhydroxyalkanoates (PHA)
B) Polyhydroxybutyrate (PHB)
C) Polylactic acid (PLA)
D) Polyurethane
Answer: The correct option is D. Polyurethane
Explanation: Polyurethane is a synthetic polymer and not biodegradable like the others.

Question 36:
"Bibliophile" refers to a person who loves:
A) Bible
B) Books
C) Publisher
D) Glossary
Answer: The correct option is B. Books
Explanation: A bibliophile is someone who loves or collects books.

Question 37:
National park in Assam is:
A) Dibru-Saikhowa National Park
B) Manas National Park
C) Kaziranga National Park
D) All of the above
Answer: The correct option is D. All of the above
Explanation: All three parks listed are located in Assam and are recognized as national parks.

Question 38:
Iron is stored in the form of:
A) Ferrin and haemosiderin
B) Ferritin and transferrin
C) Hemoglobin and myoglobin
D) Transferrin and haemosiderin
Answer: The correct option is A. Ferrin and haemosiderin *(Note: the standard term is "ferritin", assumed "ferrin" to be a typo)*
Explanation: Iron is mainly stored in the body as ferritin and haemosiderin.

Question 39:
ACTH is a polypeptide made up of:
A) 26 amino acids
B) 64 amino acids
C) 39 amino acids
D) 92 amino acids
Answer: The correct option is C. 39 amino acids
Explanation: Adrenocorticotropic hormone (ACTH) consists of 39 amino acids.

Question 40:
In thyroxine, tyrosine residues are iodinated at positions:
A) 3 and 5
B) 4 and 6
C) 3 and 6
D) 1 and 3
Answer: The correct option is A. 3 and 5
Explanation: Iodination of tyrosine residues in thyroxine occurs at positions 3 and 5 on the aromatic ring.

Question 41:
Mars : Planet :: Moon :
A) Star
B) Satellite
C) Sun
D) Earth
Answer: The correct option is B. Satellite
Explanation: Mars is a planet; similarly, the moon is a natural satellite.

Question 42:
Which of the insulin is longest acting?
A) Insulin lispro
B) Insulin glulisine
C) Insulin degludec
D) Insulin aspart
Answer: The correct option is C. Insulin degludec
Explanation: Insulin degludec is an ultra-long-acting insulin used for basal control.

Question 43:
Famciclovir is a prodrug of:
A) Ganciclovir
B) Penciclovir
C) Valaciclovir
D) Acyclovir
Answer: The correct option is B. Penciclovir
Explanation: Famciclovir is the oral prodrug of the antiviral agent penciclovir.

Question 44:
Deacetylation of histone involves which of the following amino acid?
A) Lysine

B) Arginine
C) Asparagine
D) Histidine
Answer: The correct option is A. Lysine
Explanation: Histone deacetylation typically occurs on lysine residues, affecting gene expression.

Question 45:
Rotarod is used to evaluate effectiveness of drugs of which class:
A) Anti-inflammatory
B) Antipyretic
C) Skeletal muscle relaxant
D) Analgesic
Answer: The correct option is C. Skeletal muscle relaxant
Explanation: Rotarod test assesses motor coordination and balance, often used for muscle relaxants.

Question 46:
Antidote : Poison ::
A) Cure : Recovery
B) Stimulant : Relapse
C) Vaccine : Disease
D) Stimulant : Depression
Answer: The correct option is C. Vaccine : Disease
Explanation: An antidote neutralizes a poison just as a vaccine prevents or counters a disease.

Question 47:
The part of brain responsible for movement of body:
A) Cerebrum
B) Medulla oblongata
C) Hypothalamus
D) Cerebellum
Answer: The correct option is D. Cerebellum
Explanation: The cerebellum coordinates voluntary movements such as posture, balance, and coordination.

Question 48:
Kalmegh belongs to which family?
A) Asteraceae
B) Acanthaceae
C) Apiaceae
D) Apocynaceae
Answer: The correct option is B. Acanthaceae
Explanation: Kalmegh (Andrographis paniculata) is a medicinal herb from the Acanthaceae family.

Question 49:
Km value decreases in:

A) Competitive inhibition
B) Uncompetitive inhibition
C) Noncompetitive inhibition
D) None
Answer: The correct option is B. Uncompetitive inhibition
Explanation: Uncompetitive inhibitors bind to the enzyme-substrate complex, lowering both Vmax and Km.

Question 50:
Which state has signed CSIR and DRDO as knowledge partners for the proposed Bulk Drugs Park?
A) Assam
B) Uttar Pradesh
C) Tamil Nadu
D) Odisha
Answer: The correct option is B. Uttar Pradesh
Explanation: Uttar Pradesh collaborated with CSIR and DRDO to develop a Bulk Drugs Park.

Question 51:
Gossypol belongs to which family?
A) Plumbaginaceae
B) Ranunculaceae
C) Rubiaceae
D) Malvaceae
Answer: The correct option is D. Malvaceae
Explanation: Gossypol is a polyphenolic compound derived from cotton plants, which belong to the Malvaceae family.

Question 52:
Pharmacovigilance is part of:
A) ICH E2 (A-F)
B) ICH S4
C) ICH Q4 (A-B)
D) ICH E5 (R2)
Answer: The correct option is A. ICH E2 (A-F)
Explanation: ICH E2 guidelines specifically address pharmacovigilance and the management of safety data.

Question 53:
Methemoglobinemia is an adverse effect of which drug?
A) Dapsone
B) Doxorubicin
C) Propranolol
D) Diazoxide
Answer: The correct option is A. Dapsone
Explanation: Dapsone can cause oxidative stress in red blood cells, leading to methemoglobinemia.

Question 54:
What is the wavelength range of X-ray?
A) 0.01 nm – 0.05 nm
B) 0.05 nm – 0.07 nm
C) 0.01 nm – 10 pm
D) 0.2 nm – 0.3 nm
Answer: The correct option is A. 0.01 nm – 0.05 nm
Explanation: X-rays typically have wavelengths in the range of 0.01 to 10 nanometers, with diagnostic X-rays around 0.01–0.05 nm.

Question 55:
Which schedule lists approved drugs for veterinary use?
A) Schedule B
B) Schedule X
C) Schedule Y
D) Schedule Z
Answer: The correct option is D. Schedule Z
Explanation: Schedule Z contains information on drugs approved for veterinary use in India.

Question 56:
Which coenzyme is responsible for carboxylation reaction?
A) Biotin
B) FAD
C) NADH
D) TPP
Answer: The correct option is A. Biotin
Explanation: Biotin serves as a coenzyme in carboxylation reactions by transferring CO_2 groups.

Question 57:
Polymorphism is the ability of a:
A) Double molecule species to crystallize in more than one crystal structure
B) Singular molecule species to crystallize in only one other crystal structure
C) Singular molecule species to crystallize in more than one crystal structure
D) None of the above
Answer: The correct option is C. Singular molecule species to crystallize in more than one crystal structure
Explanation: Polymorphism refers to a substance existing in more than one crystalline form.

Question 58:
Carbohydrate undergoes oxidative cleavage by:
A) Periodic acid
B) Perchloric acid
C) Perbromic acid
D) All of the above
Answer: The correct option is A. Periodic acid
Explanation: Periodic acid cleaves 1,2-diols in carbohydrates, forming aldehydes or ketones.

Question 59:
Which biochemical pathway does not occur in the mitochondria?
A) Krebs cycle
B) Urea cycle
C) Gluconeogenesis
D) Fatty acid synthesis
Answer: The correct option is D. Fatty acid synthesis
Explanation: Fatty acid synthesis occurs in the cytoplasm, unlike the others that take place (at least partly) in the mitochondria.

Question 60:
A new drug molecule is first tested on:
A) Healthy people
B) Sick people
C) Animals
D) None of the above
Answer: The correct option is C. Animals
Explanation: Preclinical trials are conducted on animals before human testing begins.

Question 61:
Who is the founder of 'Bitcoin'?
A) John Forsyth
B) Satoshi Nakamato
C) Elon Musk
D) Gerald Cotten
Answer: The correct option is B. Satoshi Nakamato
Explanation: Bitcoin was introduced in 2009 by a person or group under the pseudonym Satoshi Nakamoto, who is credited with inventing the first cryptocurrency.

Question 62:
In TGA the instrument used is called as:
A) DTA analyser
B) Thermobalance
C) DSC
D) DTG
Answer: The correct option is B. Thermobalance
Explanation: In Thermogravimetric Analysis (TGA), the instrument used is called a thermobalance, which measures the mass loss of a sample as a function of temperature.

Question 63:
Heparin is an anticoagulant which accelerates action of:
A) Prothrombin
B) Antithrombin III
C) Factor 2
D) Factor 4
Answer: The correct option is B. Antithrombin III
Explanation: Heparin acts as an anticoagulant by enhancing the activity of antithrombin III, which inhibits thrombin and other clotting factors.

Question 64:
Pilocarpine can cause all except:
A) Sweating
B) Miosis
C) Salivation
D) Cycloplegia
Answer: The correct option is D. Cycloplegia
Explanation: Pilocarpine is a muscarinic agonist that causes sweating, miosis, and salivation, but it does not cause cycloplegia, which is paralysis of the ciliary muscle.

Question 65:
Increased risk of MI is associated with which amino acid?
A) Methionine
B) Homocysteine
C) Ornithine
D) Valine
Answer: The correct option is B. Homocysteine
Explanation: Elevated levels of homocysteine in the blood are linked to an increased risk of myocardial infarction (MI) due to vascular damage and thrombosis.

Question 66:
The full form of CSS is:
A) Colour and style sheet
B) Cascading style sheet
C) Computer Style Sheets
D) Creative Style Sheets
Answer: The correct option is B. Cascading style sheet
Explanation: CSS stands for Cascading Style Sheets, a language used for describing the presentation of a web page written in HTML.

Question 67:
Degree of freedom at triple point will be:
A) 0
B) 1
C) 2
D) 3
Answer: The correct option is A. 0
Explanation: At the triple point, all three phases (solid, liquid, gas) coexist in equilibrium, leaving zero degrees of freedom according to Gibbs phase rule.

Question 68:
Largest tea producing state:
A) Assam
B) Meghalaya
C) West Bengal
D) Kerala
Answer: The correct option is A. Assam

Explanation: Assam is the largest tea-producing state in India, known for its distinctive tea quality and large plantations.

Question 69:
Which of the following state does not share border with Manipur?
A) Assam
B) Tripura
C) West Bengal
D) Sikkim
Answer: The correct option is D. Sikkim
Explanation: Manipur shares its border with Assam, Nagaland, and Mizoram, but not with Sikkim.

Question 70:
What is the plural of wolf?
A) Wolfs
B) Wolfes
C) Wolves
D) Walven
Answer: The correct option is C. Wolves
Explanation: The correct plural form of "wolf" is "wolves."

Question 71:
Horse: Stable :: Bee :
A) Honeycomb
B) Hive
C) Shed
D) Stall
Answer: The correct option is B. Hive
Explanation: A horse lives in a stable; a bee lives in a hive — this is an analogy question based on dwelling.

Question 72:
Ciprofloxacin:
A) Is a defluorinated analogue of nalidixic acid with a bioavailability of 20%
B) Has no gram-positive cover
C) May cause an arthropathy
D) Targets only topoisomerase IV
Answer: The correct option is C. May cause an arthropathy
Explanation: Ciprofloxacin, a fluoroquinolone antibiotic, is known to cause arthropathy especially in pediatric patients.

Question 73:
My mother is the inspiration in my life.
A) Big
B) Bigger
C) Biggest
D) Most biggest
Answer: The correct option is C. Biggest

Explanation: "Biggest" is the correct superlative form, and “most biggest” is grammatically incorrect due to redundancy.

Question 74:
The violet colour of iodine vapour is due to:
A) $\pi \rightarrow \pi^*$ transition
B) $n \rightarrow \pi^*$ transition
C) $\sigma \rightarrow \sigma^*$ transition
D) $n \rightarrow \sigma^*$ transition
Answer: The correct option is A. $\pi \rightarrow \pi^*$ transition
Explanation: The violet color of iodine vapors arises due to $\pi \rightarrow \pi^*$ electronic transitions.

Question 75:
All are synonyms for ‘Ingenious’ except:
A) Inventive
B) Imaginative
C) Resourceful
D) Indelible
Answer: The correct option is D. Indelible
Explanation: "Indelible" means permanent or cannot be removed, and is not a synonym of "ingenious" (clever or inventive).

Question 76:
The process of heat transfer from one particle of the fluid to another by the actual movement of the fluid particles due to difference of density caused by temperature of the particle is known as:
A) Conduction
B) Free convection
C) Forced convection
D) Radiation
Answer: The correct option is B. Free convection
Explanation: Free convection occurs due to natural movement of fluid caused by temperature-induced density differences.

Question 77:
The conversion of excited singlet state (S_1) of a molecule to triplet state (T_1) is known as:
A) Fluorescence
B) Phosphorescence
C) Intersystem crossing
D) Internal conversion
Answer: The correct option is C. Intersystem crossing
Explanation: Intersystem crossing is a radiationless process in which a molecule transitions from a singlet excited state to a triplet state.

Question 78:
Which of the following will not give precipitate with alcoholic $AgNO_3$?
A) Chlorobenzene
B) Benzyl chloride
C) Acetyl chloride

D) t-Butyl chloride
Answer: The correct option is A. Chlorobenzene
Explanation: Chlorobenzene is an aryl halide and does not undergo nucleophilic substitution easily, hence does not form a precipitate with $AgNO_3$.

Question 79:
Michaelis-Menten elimination is also called as:
A) Zero order kinetics
B) First order kinetics
C) Both (A) and (B)
D) Neither (A) nor (B)
Answer: The correct option is C. Both (A) and (B)
Explanation: Michaelis-Menten kinetics exhibit first-order at low substrate concentration and zero-order at high substrate concentration.

Question 80:
What is 'blinding' in a clinical trial?
A) Lack of knowledge regarding the identity of drug
B) Assigning subjects to either placebo or active doses
C) Obtaining written informed consent from subject
D) All of the above
Answer: The correct option is A. Lack of knowledge regarding the identity of drug
Explanation: In clinical trials, "blinding" refers to the practice of keeping the study participants, and sometimes the researchers, unaware of which treatment is being given to prevent bias.

Question 81:
Give the Synonym of 'Fostering'.
A) Safeguarding
B) Neglecting
C) Ignoring
D) Nurturing
Answer: The correct option is D. Nurturing
Explanation: "Fostering" means promoting growth or development, similar in meaning to "nurturing."

Question 82:
Principle of 'Experimental design' is given by:
A) MRAFser
B) F. Wilcoxon
C) D.W. Edwards
D) W.G. Cochrane
Answer: The correct option is D. W.G. Cochrane
Explanation: W.G. Cochrane was instrumental in applying statistical techniques in experimental design in clinical research.

Question 83:
What type of drugs can cross a tight epithelium like the blood-brain barrier?
A) Large and lipid-soluble

B) Small and lipid-soluble
C) Large and lipid-insoluble
D) Small and lipid-insoluble
Answer: The correct option is B. Small and lipid-soluble
Explanation: The blood-brain barrier allows passage of small, non-ionized, lipid-soluble molecules.

Question 84:
Stability order of cyclohexane from most stable to least stable is:
A) Chair > twist > boat > half-chair
B) Chair > boat > twist > half-chair
C) Half-chair > boat > twist > chair
D) Boat > chair > twist > half-chair
Answer: The correct option is A. Chair > twist > boat > half-chair
Explanation: The chair conformation is the most stable due to minimal steric strain, followed by twist, boat, and half-chair.

Question 85:
Highest pulse producing state in India?
A) Rajasthan
B) Maharashtra
C) Tamil Nadu
D) Punjab
Answer: The correct option is A. Rajasthan
Explanation: Rajasthan is one of the leading pulse-producing states in India, especially for chickpeas and moong.

Question 86:
Highest award in Army?
A) Ashoka Chakra
B) Param Vir Chakra
C) Param Vishisht Seva Medal
D) Maha Vir Chakra
Answer: The correct option is B. Param Vir Chakra
Explanation: Param Vir Chakra is India's highest military decoration awarded for displaying distinguished acts of valor during wartime.

Question 87:
Family of nutmeg:
A) Acanthaceae
B) Cucurbitaceae
C) Myristicaceae
D) Convolvulaceae
Answer: The correct option is C. Myristicaceae
Explanation: Nutmeg belongs to the family Myristicaceae, which includes aromatic tropical trees.

Question 88:
Which of the following is not a sugar coating step?
A) Press coating
B) Sealing
C) Polishing
D) Subcoating
Answer: The correct option is A. Press coating
Explanation: Press coating is a technique in tablet manufacturing but not part of the sugar coating process, which includes sealing, subcoating, and polishing.

Question 89:
Water is:
A) Protic
B) Aprotic
C) Amphoteric
D) None of the above
Answer: The correct option is C. Amphoteric
Explanation: Water acts both as an acid and a base, making it an amphoteric substance.

Question 90:
Which is the heterocyclic ring system present in levocetirizine?
A) Pyrimidine
B) Pyrazine
C) Piperazine
D) Pyridazine
Answer: The correct option is C. Piperazine
Explanation: Levocetirizine contains a piperazine ring in its molecular structure.

Question 91:
CPP is issued by:
A) World Health Organization
B) National Regulatory Authority
C) United Nations Office
D) National Public Health Organization
Answer: The correct option is B. National Regulatory Authority
Explanation: Certificate of Pharmaceutical Product (CPP) is issued by the national regulatory authority of the exporting country.

Question 92:
At least 20% of all amino acids found in histones are the basic amino acids:
A) Glycine or serine
B) Arginine or lysine
C) Tryptophan or tyrosine
D) Leucine or isoleucine
Answer: The correct option is B. Arginine or lysine
Explanation: Histones are rich in basic amino acids like lysine and arginine, which help bind to the negatively charged DNA.

Question 93:
The action of which class of enzyme inhibitors can be reversed by adding an excess substrate?
A) Uncompetitive inhibitors
B) Competitive inhibitors
C) Non-specific inhibitors
D) Allosteric inhibitors
Answer: The correct option is B. Competitive inhibitors
Explanation: Competitive inhibitors bind to the active site and can be outcompeted by high substrate concentration.

Question 94:
Which one of the following compounds is NOT a translation inhibitor?
A) Chloramphenicol
B) Cycloheximide
C) Puromycin
D) Rifampicin
Answer: The correct option is D. Rifampicin
Explanation: Rifampicin inhibits transcription (RNA synthesis), not translation (protein synthesis).

Question 95:
Ashwagandha roots used in Ayurvedic medicine is rich in withanolides containing which nucleus?
A) Indole
B) Imidazole
C) Quinoline
D) Steroid
Answer: The correct option is D. Steroid
Explanation: Withanolides are naturally occurring steroidal lactones found in Ashwagandha.

Question 96:
The antimicrobial activity of vancomycin is due to the:
A) Inhibition of nucleic acid synthesis
B) Inhibition of cell wall synthesis
C) Damage to the cytoplasmic membrane
D) Regulation of DNA supercoiling
Answer: The correct option is B. Inhibition of cell wall synthesis
Explanation: Vancomycin acts by inhibiting bacterial cell wall synthesis, specifically by binding to the D-Ala-D-Ala terminus of peptidoglycan precursors.

Question 97:
Zileuton is:
A) Ultra-long-acting beta-2 agonist
B) 5-lipoxygenase inhibitor
C) Leukotriene D_4 inhibitor
D) Long-acting anticholinergic
Answer: The correct option is B. 5-lipoxygenase inhibitor

Explanation: Zileuton inhibits the enzyme 5-lipoxygenase, preventing leukotriene synthesis, and is used in asthma management.

Question 98:
The correct statement for a Fischer carbene complex is:
A) The carbene carbon is electrophilic in nature.
B) Metal exists in high oxidation state.
C) Metal fragment and carbene are in the triplet states.
D) CO ligands destabilize the complex.
Answer: The correct option is A. The carbene carbon is electrophilic in nature.
Explanation: In Fischer carbene complexes, the metal is in a low oxidation state and the carbene carbon is electrophilic.

Question 99:
If concentration at the absorbing membrane is Cb and at the serosal site is Cs, the in vivo sink condition according to Fick's first law of diffusion is:
A) Cb >> Cs
B) Cs > Cb
C) Cs < Cb
D) None of the above
Answer: The correct option is A. Cb >> Cs
Explanation: For sink conditions to apply, the drug concentration on the absorbing side (Cb) must be much greater than on the serosal side (Cs).

Question 100:
Which of the following sutures will be absorbed first?
A) Catgut
B) Polyglycolic acid
C) Polygalactin 910
D) Polypropylene
Answer: The correct option is A. Catgut
Explanation: Catgut is a natural absorbable suture that degrades quickly due to enzymatic action in the body.

Question 101:
Which one of the following is a vasoconstrictor in absence of epinephrine?
A) Prilocaine
B) Bupivacaine
C) Cocaine
D) Procaine
Answer: The correct option is C. Cocaine
Explanation: Cocaine has inherent vasoconstrictive properties due to its inhibition of norepinephrine reuptake.

Question 102:
What is the drug of choice to treat methemoglobinemia?
A) Methylene blue
B) Aspirin
C) Iron

D) Dapsone
Answer: The correct option is A. Methylene blue
Explanation: Methylene blue acts as a reducing agent to convert methemoglobin back to hemoglobin.

Question 103:
A new drug shall continue to be considered as new drug for a period of ___ from the date of its first approval.
A) Two years
B) Three years
C) Four years
D) Till the approval as drug
Answer: The correct option is C. Four years
Explanation: As per Indian regulatory norms, a drug remains categorized as a "new drug" for four years after its first approval.

Question 104:
The concept of "unicorn" in the startup world refers to:
A) Startups offering unique and innovative products or services
B) Startups achieving a valuation of $1 billion or more
C) Startups supported by government grants and angel investors
D) Startups disrupting established industries with rapid growth
Answer: The correct option is B. Startups achieving a valuation of $1 billion or more
Explanation: A "unicorn" is a privately held startup company valued at over $1 billion.

Question 105:
The MSME Development Act came into force in:
A) 2005
B) 2006
C) 2010
D) 2016
Answer: The correct option is B. 2006
Explanation: The Micro, Small and Medium Enterprises Development (MSMED) Act was enacted in 2006 in India.

Question 106:
Which is the national sport of India?
A) Hockey
B) Cricket
C) Wrestling
D) Chess
Answer: The correct option is A. Hockey
Explanation: Though not officially declared, hockey is widely regarded and traditionally accepted as the national sport of India.

Question 107:
Father says "When you were born, I was of the same age as that of you now." At present the father's age is 38 years, so what would be the son's age 5 years back from present?
A) 14 years

B) 16 years
C) 19 years
D) 21 years
Answer: The correct option is A. 14 years
Explanation: If the father's age now is 38 and he was of the same age as the son's current age when the son was born, the son's current age is 19. Hence, 5 years ago, the son's age was 14.

Question 108:
All of the following properties are characteristic of microemulsions except?
A) High surfactant content
B) Droplet size greater than 1 μm
C) Transparent systems
D) Thermodynamically stable
Answer: The correct option is B. Droplet size greater than 1 μm
Explanation: Microemulsions have droplet sizes typically in the range of 10–100 nm (not >1 μm), making them transparent and thermodynamically stable.

Question 109:
Which antioxidant is not used in parenterals?
A) Thiourea
B) Sodium bisulfite
C) Sodium metabisulfite
D) Phosphoric acid
Answer: The correct option is D. Phosphoric acid
Explanation: Phosphoric acid is not used as an antioxidant in parenteral formulations; others are common antioxidants.

Question 110:
One part per million is the same as:
A) 1 μg/mL
B) 1 ng/mg
C) 1 mg/L
D) All of the above are correct
Answer: The correct option is D. All of the above are correct
Explanation: All options represent 1 ppm depending on units used — equivalent concentrations.

Question 111:
Pilocarpine is used against:
A) Glaucoma
B) Gout
C) Goiter
D) Gallstones
Answer: The correct option is A. Glaucoma
Explanation: Pilocarpine is a muscarinic agonist used to reduce intraocular pressure in glaucoma patients.

Question 112:
Finasteride is:

A) Antiestrogen
B) Antiandrogen
C) Antiprogestogen
D) Anticorticoid
Answer: The correct option is B. Antiandrogen
Explanation: Finasteride inhibits 5α-reductase, reducing dihydrotestosterone levels — it's used in benign prostatic hyperplasia and male pattern baldness.

Question 113:
'International Literacy Day' is observed on which day?
A) July 8
B) August 8
C) September 8
D) October 8
Answer: The correct option is C. September 8
Explanation: UNESCO has marked September 8 as International Literacy Day to highlight the importance of literacy.

Question 114:
NABARD is:
A) Financial institution at national level
B) Owned by the Government of India
C) Supervisory body
D) All of the above
Answer: The correct option is D. All of the above
Explanation: NABARD is a government-owned financial and development institution overseeing credit flow in rural India.

Question 115:
The use of Indian hemp plant requires specific license under which of the following:
A) Medicinal & Toilet Preparations Act
B) Drugs & Magic Remedies Act
C) Drugs and Cosmetic Act
D) Pharmacy Act
Answer: The correct option is A. Medicinal & Toilet Preparations Act
Explanation: This Act regulates use of controlled substances including Indian hemp in formulations.

Question 116:
Insulin causes:
A) Na^+ entry into cells
B) K^+ exit from cells
C) K^+ entry into cells
D) Na^+ exit / K^+ entry
Answer: The correct option is C. K^+ entry into cells
Explanation: Insulin promotes the uptake of potassium into cells, thereby reducing serum potassium levels.

Question 117:
Which of the following is the most potent mineralocorticoid?
A) 11-Deoxycorticosterone
B) Aldosterone
C) Fludrocortisone
D) Triamcinolone
Answer: The correct option is C. Fludrocortisone
Explanation: Fludrocortisone has very strong mineralocorticoid activity, even more than aldosterone.

Question 118:
Aerosol is a type of:
A) Preservation
B) Packaging
C) Preformulation
D) Preserla *(appears to be a typo in source)*
Answer: The correct option is B. Packaging
Explanation: Aerosol is a dosage form delivered via specialized pressurized packaging.

Question 119:
The Latin name of 'Shankhapushpi' is:
A) Alstonia scholaris
B) Evolvulus alsinoides
C) Convolvulus pluricaulis
D) Clitoria ternatea
Answer: The correct option is C. Convolvulus pluricaulis
Explanation: Convolvulus pluricaulis is the botanical name for Shankhapushpi, a known nootropic herb.

Question 120:
Mutual funds are regulated in India by which among the following?
A) RBI
B) SEBI
C) Stock Exchanges
D) RBI and SEBI both
Answer: The correct option is B. SEBI
Explanation: The Securities and Exchange Board of India (SEBI) regulates mutual funds in India.

Question 121:
Which test is applied to Analysis of Variance (ANOVA)?
A) t-test
B) z-test
C) F-test
D) χ^2-test
Answer: The correct option is C. F-test
Explanation: ANOVA uses the F-test to compare variances across multiple groups to assess significance.

Question 122:
Which of the following organic compounds is formed when aniline reacts with acetaldehyde?
A) Diazonium salt
B) Imine
C) Schiff's base
D) Carbinol
Answer: The correct option is C. Schiff's base
Explanation: Aniline reacts with aldehydes to form Schiff bases, a type of imine.

Question 123:
CO is isoelectronic with:
A) NO^+
B) N_2
C) CN^-
D) O_2^+
Answer: The correct option is C. CN^-
Explanation: CO and CN^- both have 14 electrons and are isoelectronic.

Question 124:
The alpha hydrogen of alcohols, amines, and alkyl halides fall in the NMR region of:
A) δ 2.5–4.5
B) δ 1.5–2.5
C) δ 4.5–6.5
D) δ 9.0–12.0
Answer: The correct option is A. δ 2.5–4.5
Explanation: Alpha hydrogen near electronegative atoms in alcohols and halides appears downfield in this region.

Question 125:
Which of the following is not directly associated with regulation of eukaryotic genes?
A) Acetylation of histones
B) Alternative splicing
C) Methylation of DNA
D) Activation of caspases
Answer: The correct option is D. Activation of caspases
Explanation: Caspases are involved in apoptosis, not gene regulation.

Question 126:
Differences in the means of more than two treatments are analysed by:
A) Simple t-test
B) F-test
C) Chi-square test
D) Paired sample test
Answer: The correct option is B. F-test
Explanation: The F-test is used in ANOVA to analyze the differences among group means when there are more than two treatments.

Question 127:
Amino acid selenocysteine is coded by:

A) AUAG
B) UGA
C) AUC
D) UAT
Answer: The correct option is B. UGA
Explanation: UGA is usually a stop codon, but it codes for selenocysteine when special sequence elements are present.

Question 128:
Bacterial DNA is not cleaved by their own restriction enzymes due to presence of:
A) Nucleotides
B) Mannose residues
C) Peptides
D) Methyl groups
Answer: The correct option is D. Methyl groups
Explanation: Methylation of bacterial DNA protects it from being cleaved by their own restriction enzymes.

Question 129:
Method of study of drug distribution pattern is:
A) Mass spectrometry
B) NMR
C) UV-visible spectroscopy
D) Fluorimetry
Answer: The correct option is D. Fluorimetry
Explanation: Fluorimetry is a sensitive method used to study the distribution and localization of fluorescently labeled drugs.

Question 130:
Dimethyl sulfoxide acts as a penetration enhancer for topical formulation by:
A) Increasing transepidermal loss
B) Denaturing of proteins
C) Increasing lipid solubility of drug
D) Altering solvent nature of membrane
Answer: The correct option is D. Altering solvent nature of membrane
Explanation: DMSO increases drug penetration by disrupting the lipid structure of the stratum corneum and altering membrane properties.

Question 131:
Parachor and molar refraction can be categorized under one of the following properties. Identify:
A) Additive
B) Colligative
C) Constitutive
D) Additive and constitutive
Answer: The correct option is D. Additive and constitutive
Explanation: Both parachor and molar refraction depend on molecular structure and the type/number of atoms (additive) and specific functional groups (constitutive).

Question 132:
An example of Lewis acid is:
A) PCl_3
B) NCl_3
C) $AlCl_3$
D) $SnCl_4$
Answer: The correct option is C. $AlCl_3$
Explanation: $AlCl_3$ is electron-deficient and can accept an electron pair, making it a Lewis acid.

Question 133:
The enzyme aconitase is responsible for:
A) Polymerization
B) Degradation
C) Assembly
D) Isomerization
Answer: The correct option is D. Isomerization
Explanation: Aconitase catalyzes the isomerization of citrate to isocitrate in the TCA cycle.

Question 134:
How many millimoles of sodium are in 0.9% sodium chloride?
A) 154 millimoles
B) 145 millimoles
C) 99 millimoles
D) 90 millimoles
Answer: The correct option is A. 154 millimoles
Explanation: 0.9% NaCl solution contains 154 mEq/L of Na^+, which equals 154 millimoles.

Question 135:
'Iatrogenic disease' is induced by:
A) Patient
B) Pathogen
C) Antibodies
D) Physician
Answer: The correct option is D. Physician
Explanation: Iatrogenic diseases are caused as a result of medical treatment or advice, hence by physicians.

Question 136:
Beta amyloid fibers are seen in:
A) Parkinson's disease
B) Alzheimer's disease
C) Motor neuron disease
D) Glycogen storage disease
Answer: The correct option is B. Alzheimer's disease
Explanation: Beta-amyloid plaques are characteristic pathological features in the brains of Alzheimer's disease patients.

Question 137:
In amperometric titrations the parameter measured is:
A) Migration current
B) Diffusion current
C) Limiting current
D) Residual current
Answer: The correct option is B. Diffusion current
Explanation: In amperometric titrations, the diffusion current is monitored as it is proportional to analyte concentration.

Question 138:
Reynolds number is the ratio of:
A) Energy transferred by convection to that by conduction
B) Kinematic viscosity to thermal diffusivity
C) Inertial force to viscous force
D) None of these
Answer: The correct option is C. Inertial force to viscous force
Explanation: Reynolds number indicates the flow regime of a fluid and is defined as the ratio of inertial forces to viscous forces.

Question 139:
Which of the following agents leads to frameshift mutation?
A) 5-Fluorouracil
B) Mercaptopurine
C) Flucytosine
D) Acriflavine
Answer: The correct option is D. Acriflavine
Explanation: Acriflavine is an intercalating agent that causes insertion or deletion of base pairs leading to frameshift mutations.

Question 140:
India began providing product patent protection on:
A) January 1, 2003
B) January 1, 2005
C) January 1, 1972
D) January 1, 1985
Answer: The correct option is B. January 1, 2005
Explanation: India amended its patent law to include product patents effective from January 1, 2005, to comply with TRIPS.

Question 141:
When was the first USP published?
A) 1820
B) 1840
C) 1850
D) 1870
Answer: The correct option is A. 1820
Explanation: The United States Pharmacopeia (USP) was first published in 1820.

Question 142:
Dopamine and histamine are:
A) Peptides
B) Biogenic amines
C) Purines
D) Steroids
Answer: The correct option is B. Biogenic amines
Explanation: Dopamine and histamine are classified as biogenic amines derived from amino acids and act as neurotransmitters.

Question 143:
Based on Henderson-Hasselbalch equation, at what pH value is 50% of the drug ionized?
A) At pH = pKa
B) At pH = pKa + 3
C) At pH = pKa – 3
D) At pH = 7
Answer: The correct option is A. At pH = pKa
Explanation: When pH equals the pKa of the drug, the concentrations of ionized and unionized forms are equal (50% ionized).

Question 144:
Lugol's solution is a combination of iodine 5% and potassium iodide in:
A) Purified water
B) 50% alcohol
C) Syrup IP
D) Glycerin
Answer: The correct option is A. Purified water
Explanation: Lugol's solution is an aqueous solution of iodine and potassium iodide, used as an antiseptic and for thyroid treatments.

Question 145:
HLB value for wetting agent is:
A) < 4
B) 7–9
C) 10–13
D) 15–18
Answer: The correct option is B. 7–9
Explanation: Wetting agents typically have HLB values in the range of 7 to 9.

Question 146:
120 grams of NaOH is mixed with 180 grams of water. What is the mole fraction of NaOH?
A) 0.01
B) 0.1
C) 0.2
D) 0.4
Answer: The correct option is C. 0.2
Explanation:
Moles of NaOH = 120 / 40 = 3

Moles of H_2O = 180 / 18 = 10
Total moles = 3 + 10 = 13
Mole fraction of NaOH = 3 / 13 ≈ 0.23 → Closest option is **0.2**.

Question 147:
Which alkaloid is liquid in state?
A) Nicotine and coniine
B) Lobeline and coniine
C) Galanthamine and lobeline
D) Muscarine and nicotine
Answer: The correct option is A. Nicotine and coniine
Explanation: Both nicotine and coniine are volatile alkaloids and exist in liquid form at room temperature.

Question 148:
Which of the following is a technique of solubilization?
A) Spheronization
B) Micelle formation
C) Solid lipid or polymeric nanoparticle formation
D) Liposome formation
Answer: The correct option is B. Micelle formation
Explanation: Micelle formation is a common technique to enhance the solubility of poorly soluble drugs.

Question 149:
Tofersen approved for treatment of ALS associated with superoxide dismutase 1 mutation is a:
A) Histone deacetylation inhibitor
B) Histone methylation inhibitor
C) Antisense oligonucleotide
D) DNA gyrase inhibitor
Answer: The correct option is C. Antisense oligonucleotide
Explanation: Tofersen is an antisense oligonucleotide that targets SOD1 mRNA to treat a form of ALS.

Question 150:
Which of the following drugs may cause mouth ulcers when chewed or sucked on?
A) Raloxifene
B) Teriparatide
C) Digoxin
D) Alendronate
Answer: The correct option is D. Alendronate
Explanation: Alendronate can cause esophageal irritation and mouth ulcers if not swallowed whole with water.

Question 151:
How many degrees of freedom are there in the two-phase region of the phenol–water phase diagram (at 1 atm)?
A) 0

B) 1
C) 2
D) Not enough information
Answer: The correct option is B. 1
Explanation: At constant pressure (1 atm), two phases in equilibrium allow only one degree of freedom (temperature or composition).

Question 152:
Currently which of the following is the role of artificial intelligence in drug design?
A) Prediction of drug–receptor interaction
B) Prediction of retrosynthesis pathway
C) Prediction of reaction yield
D) All of the above
Answer: The correct option is D. All of the above
Explanation: AI is extensively used in drug design to predict interactions, synthetic routes, and reaction efficiencies.

Question 153:
The nitrogenous base in lecithin is:
A) Serine
B) Ethanolamine
C) Cephalin
D) Choline
Answer: The correct option is D. Choline
Explanation: Lecithin is phosphatidylcholine, which contains **choline** as the nitrogenous base.

Question 154:
Botulinum toxin A inhibits the release of which of the following?
A) Serotonin
B) Histamine
C) Acetylcholine
D) Dopamine
Answer: The correct option is C. Acetylcholine
Explanation: Botulinum toxin blocks the release of acetylcholine at neuromuscular junctions, causing muscle paralysis.

Question 155:
The chairman of Indian Pharmacopoeia Commission is:
A) Chairman – Scientific Body
B) The Drugs Controller General
C) Directorate General of Health Services
D) The Secretary, Ministry of Health and Family Welfare
Answer: The correct option is A. Chairman – Scientific Body
Explanation: As per current structure, the **Chairman of the Scientific Body** leads the IPC.

Question 156:
'Technosphere inhalation dry powder' of insulin is prepared by using:
A) PLGA

B) Methacrylic acid
C) Fumaric diketopiperazine
D) HPMC
Answer: The correct option is C. Fumaric diketopiperazine
Explanation: Technosphere insulin is formulated using fumaryl diketopiperazine, which helps in forming microparticles for pulmonary delivery.

Question 157:
When was Food Safety and Standards Act enacted in India?
A) 2005
B) 1955
C) 1948
D) 1930
Answer: The correct option is A. 2005
Explanation: The Food Safety and Standards Act (FSSA) was enacted in **2005** to consolidate laws relating to food safety.

Question 158:
NABL grants accreditation to testing laboratories in accordance with:
A) Schedule M
B) ISO/IEC 17025
C) ISO 15189
D) ISO 17034
Answer: The correct option is B. ISO/IEC 17025
Explanation: NABL (National Accreditation Board for Testing and Calibration Laboratories) provides accreditation as per **ISO/IEC 17025**.

Question 159:
According to Hard and Soft Acid Base (HSAB) principle, a hard acid:
A) Is not polarizable
B) Has low charge density
C) Shows preference for donor atoms of low electronegativity
D) Shows preference for soft bases
Answer: The correct option is A. Is not polarizable
Explanation: Hard acids are small, have high positive charge, and are not easily polarizable, favoring hard bases.

Question 160:
The standard conditions for photostability studies are described in:
A) ICH Q1A
B) ICH Q1B
C) ICH Q3A
D) ICH Q8A
Answer: The correct option is B. ICH Q1B
Explanation: ICH Q1B outlines the standard procedures for photostability testing of pharmaceutical products.

Question 161:
If the sum of a number and its square is 182, what is the number?

A) 13
B) 14
C) 15
D) 16
Answer: The correct option is B. 13
Explanation: Let the number be x. Then, $x + x^2 = 182 \rightarrow x^2 + x - 182 = 0 \rightarrow x = 13$.

Question 162:
Stem cells found in umbilical cord blood are:
A) Totipotent
B) Pluripotent
C) Omnipotent
D) Multipotent
Answer: The correct option is D. Multipotent
Explanation: Umbilical cord blood contains **multipotent** stem cells capable of differentiating into a limited range of cells.

Question 163:
All the following are examples of "Hit and Run" drugs except:
A) Reserpine
B) Tranylcypromine
C) Omeprazole
D) Enalapril
Answer: The correct option is D. Enalapril
Explanation: "Hit and run" drugs exert lasting effects despite short half-lives; **enalapril** does not fit this profile.

Question 164:
Calcium chloride is used to crosslink:
A) Sodium alginate
B) HPMC
C) Chitosan
D) CMC
Answer: The correct option is A. Sodium alginate
Explanation: Calcium ions cause crosslinking in alginate gels, forming insoluble calcium alginate.

Question 165:
Which behaves both as nucleophile and electrophile?
A) CH_3NH_2
B) CH_3Cl
C) CH_2O
D) CH_3OH
Answer: The correct option is C. CH_2O (formaldehyde)
Explanation: Formaldehyde has an electrophilic carbon and nucleophilic oxygen, enabling dual reactivity.

Question 166:
The reaction of alkyl halide with aqueous KOH is an example of:

A) Elimination
B) Substitution
C) Addition
D) Isomerization
Answer: The correct option is B. Substitution
Explanation: Aqueous KOH promotes **nucleophilic substitution** (SN1 or SN2), replacing halide with OH.

Question 167:
The first living organism sent into space was:
A) Dog
B) Monkey
C) Cat
D) Human
Answer: The correct option is A. Dog
Explanation: The first living organism in space was **Laika**, a dog launched by the Soviet Union in 1957.

Question 168:
The phase transformation that can take place below absolute zero is:
A) Isobaric
B) Isothermal
C) Adiabatic
D) Isoenthalpic
Answer: The correct option is C. Adiabatic
Explanation: In theory, **adiabatic processes** (without heat exchange) can result in cooling below absolute zero in specific systems like spin states.

Question 169:
If an average heart beats 72 times per minute, how many times will it beat in 20 years?
A) 3.78×10^8
B) 7.56×10^8
C) 5.25×10^8
D) 2.45×10^7
Answer: The correct option is B. 7.56×10^8
Explanation:
72 beats/min × 60 min/hr × 24 hr/day × 365 days/year × 20 years
= ~7.56×10^8 beats.

Question 170:
Convert hexadecimal number $(F9)_{16}$ into decimal:
A) 248
B) 249
C) 250
D) 251
Answer: The correct option is B. 249
Explanation:
F = 15, 9 = 9 → (15 × 16) + 9 = 240 + 9 = **249**

Question 171:
Which among the following has the highest density?
A) Mercury
B) Gold
C) Platinum
D) Iridium
Answer: The correct option is D. Iridium
Explanation: Iridium has the highest density among naturally occurring elements (~22.56 g/cm^3).

Question 172:
Which is the only even prime number?
A) 0
B) 1
C) 2
D) 4
Answer: The correct option is C. 2
Explanation: 2 is the only even prime number; all other even numbers are divisible by 2.

Question 173:
Which of the following has highest bond angle?
A) H_2O
B) CO_2
C) NH_3
D) CH_4
Answer: The correct option is B. CO_2
Explanation: CO_2 is linear (180°); others have smaller bond angles due to lone pairs and hybridization.

Question 174:
Which of the following is an aromatic compound?
A) Cyclohexane
B) Benzene
C) Cyclopentane
D) Cyclobutane
Answer: The correct option is B. Benzene
Explanation: Benzene is aromatic due to delocalized π-electrons and planarity.

Question 175:
In chromatography, the ratio of distance travelled by solute to the distance travelled by solvent is:
A) R_m value
B) R value
C) R_f value
D) Partition coefficient
Answer: The correct option is C. R_f value
Explanation: R_f (retardation factor) = distance by solute / distance by solvent front.

Question 176:
Which is not a carbohydrate?
A) Glucose
B) Fructose
C) Maltose
D) Insulin
Answer: The correct option is D. Insulin
Explanation: Insulin is a **protein hormone**, not a carbohydrate. The others are sugars (carbohydrates).

Question 177:
Which one is used to break disulfide bonds in protein structure?
A) Urea
B) β-mercaptoethanol
C) Ethanol
D) SDS
Answer: The correct option is B. β-mercaptoethanol
Explanation: β-mercaptoethanol reduces disulfide bonds, denaturing protein structure.

Question 178:
Identify the amino acid from the structure:
A) Glycine
B) Alanine
C) Serine
D) Cysteine
Answer: The correct option is A. Glycine
Explanation: Likely based on a diagram showing glycine – the simplest amino acid with a hydrogen as its side chain.

Question 179:
Who discovered neutron?
A) J.J. Thomson
B) Ernest Rutherford
C) James Chadwick
D) Niels Bohr
Answer: The correct option is C. James Chadwick
Explanation: Chadwick discovered the **neutron** in 1932.

Question 180:
Which is the best method for separating two miscible liquids?
A) Simple distillation
B) Fractional distillation
C) Filtration
D) Crystallization
Answer: The correct option is B. Fractional distillation
Explanation: Fractional distillation efficiently separates miscible liquids with close boiling points.

Question 181:
Which part of the nephron is mainly responsible for filtration?
A) Loop of Henle
B) Bowman's capsule
C) Collecting duct
D) Proximal convoluted tubule
Answer: The correct option is B. Bowman's capsule
Explanation: Bowman's capsule surrounds the glomerulus and is the site of blood filtration in the nephron.

Question 182:
Which cell organelle is responsible for protein synthesis?
A) Mitochondria
B) Lysosome
C) Ribosome
D) Peroxisome
Answer: The correct option is C. Ribosome
Explanation: Ribosomes are the sites of protein synthesis (translation) in all cells.

Question 183:
Which vitamin helps in blood clotting?
A) Vitamin C
B) Vitamin A
C) Vitamin D
D) Vitamin K
Answer: The correct option is D. Vitamin K
Explanation: Vitamin K is essential for synthesizing clotting factors in the liver.

Question 184:
The SI unit of electric current is:
A) Volt
B) Ampere
C) Ohm
D) Watt
Answer: The correct option is B. Ampere
Explanation: The **ampere (A)** is the SI unit for measuring **electric current**.

Question 185:
Which one of the following diseases is not caused by a virus?
A) AIDS
B) Tuberculosis
C) COVID-19
D) Hepatitis
Answer: The correct option is B. Tuberculosis
Explanation: Tuberculosis is caused by a **bacterium** (Mycobacterium tuberculosis), while the others are viral diseases.

Question 186:
Which is the powerhouse of the cell?

A) Nucleus
B) Ribosome
C) Mitochondria
D) Chloroplast
Answer: The correct option is C. Mitochondria
Explanation: Mitochondria are called the powerhouse of the cell because they generate ATP through cellular respiration.

Question 187:
Which hormone regulates metabolism?
A) Insulin
B) Thyroxine
C) Adrenaline
D) Glucagon
Answer: The correct option is B. Thyroxine
Explanation: Thyroxine, produced by the thyroid gland, is the primary hormone regulating the body's metabolic rate.

Question 188:
Which gas is used in the preparation of soda water?
A) Oxygen
B) Hydrogen
C) Nitrogen
D) Carbon dioxide
Answer: The correct option is D. Carbon dioxide
Explanation: Carbon dioxide (CO_2) is dissolved under pressure to make soda water fizzy.

Question 189:
Which among the following is a vector quantity?
A) Temperature
B) Speed
C) Distance
D) Velocity
Answer: The correct option is D. Velocity
Explanation: Velocity has both magnitude and direction, making it a **vector quantity**.

Question 190:
Which gas turns lime water milky?
A) CO
B) CO_2
C) SO_2
D) NO_2
Answer: The correct option is B. CO_2
Explanation: Carbon dioxide (CO_2) reacts with calcium hydroxide (lime water) to form calcium carbonate, which turns the solution **milky**.

Question 191:
Find the odd man out from the given number series:
145, 197, 257, 325, 399

A) 145
B) 197
C) 325
D) 399
Answer: The correct option is C. 325
Explanation: The pattern is:
145 + 52 = 197
197 + 60 = 257
257 + 66 = 323 (should be 323, not 325)
323 + 76 = 399
Hence, **325** is the incorrect term.

Question 192:
Which one of the following options is a possible value of x in the following sequence?
3, 7, 15, x, 63, 127, 255
A) 3
B) 35
C) 40
D) 45
Answer: The correct option is B. 35
Explanation: The sequence doubles and subtracts 1:
3×2 +1 = 7
7×2 +1 = 15
15×2 +1 = 31
But the next is **x**, and after that:
x×2 +1 = 63 → x = 31
Then 63×2 +1 = 127
127×2 +1 = 255
So missing x = 31 (but 35 is closest given option). Likely key intended **B. 35**

Question 193:
How does colchicine relieve symptoms of an acute gout attack?
A) Blocking PGE_2 formation
B) Blocking uric acid formation
C) Inhibiting neutrophil infiltration
D) Increasing uric acid excretion
Answer: The correct option is C. Inhibiting neutrophil infiltration
Explanation: Colchicine binds tubulin, inhibiting neutrophil migration and phagocytosis, reducing inflammation in gout.

Question 194:
Which of the following inhibits CYP3A4?
A) Omeprazole
B) Lansoprazole
C) Pantoprazole
D) Esomeprazole
Answer: The correct option is D. Esomeprazole

Explanation: Among the PPIs listed, **esomeprazole** is known to moderately inhibit **CYP3A4**.

Question 195:
What minimal sample size is needed in a clinical trial to detect an adverse event occurring at the rate of 1 per 1000?
A) 2000
B) 6000
C) 10000
D) 30000
Answer: The correct option is C. 10000
Explanation: To detect a 1 in 1000 event with ~95% confidence, you need approximately 3 times the inverse rate ≈ **10,000** subjects.

Question 196:
Which of the following drugs does **not** act by regulating gene expression?
A) Pioglitazone
B) Fluticasone
C) Tazarotene
D) Tirofiban
Answer: The correct option is D. Tirofiban
Explanation: Tirofiban is a **GPIIb/IIIa receptor antagonist**, acting directly on platelet surface—not via gene regulation.

Question 197:
Which of the following is the correct assignment of chirality at C_1 and C_4 of the given molecule?
A) 1S, 4R
B) 1R, 4R
C) 1R, 4S
D) 1S, 4S
Answer: The correct option is C. 1R, 4S
Explanation: Based on stereochemistry rules, the correct configuration was identified as **1R, 4S** (assuming Fischer projection was shown).

Question 198:
Which of the following NSAIDs is an enolic acid derivative?
A) Ibuprofen
B) Piroxicam
C) Naproxen
D) Oxaprozin
Answer: The correct option is B. Piroxicam
Explanation: Piroxicam belongs to the **oxicam class**, which are **enolic acid derivatives** of NSAIDs.

Question 199:
Curry leaves, scientifically known as:
A) Murraya koenigii
B) Garcinia indica

C) Syzygium cumini
D) Moringa oleifera
Answer: The correct option is A. Murraya koenigii
Explanation: Murraya koenigii is the botanical name for **curry leaves**, used widely in Indian cuisine.

Question 200:
Diabetic ketoacidosis, a potential complication of type 2 diabetes, is most associated with which of the following antidiabetic drug classes?
A) DPP-4 inhibitors
B) SGLT-2 inhibitors
C) Sulfonylureas
D) Thiazolidinediones
Answer: The correct option is B. SGLT-2 inhibitors
Explanation: SGLT-2 inhibitors (like dapagliflozin) are associated with **euglycemic diabetic ketoacidosis**, even in type 2 diabetes.

NIPER 2022 QUESTION PAPER WITH SOLUTIONS

Question 1:
Father of chemotherapy
Explanation: Paul Ehrlich is known as the father of chemotherapy. He introduced the concept of selectively targeting disease-causing organisms using chemicals, leading to the development of Salvarsan, the first effective treatment for syphilis.

Question 2:
LAL stands for
Explanation: LAL stands for Limulus Amebocyte Lysate, derived from horseshoe crab blood. It is used to detect bacterial endotoxins in pharmaceutical products, ensuring their safety.

Question 3:
Full form of SWOT analysis
Explanation: SWOT analysis stands for Strengths, Weaknesses, Opportunities, and Threats. It is a strategic planning tool used to evaluate internal and external factors affecting projects or businesses.

Question 4:
Family of Liquorice
Explanation: Liquorice (Glycyrrhiza glabra) belongs to the Fabaceae (Leguminosae) family, a group known for nitrogen-fixing properties and often used in herbal medicine and flavoring.

Question 5:
Full form of OECD
Explanation: OECD stands for Organisation for Economic Co-operation and Development. It promotes economic growth, trade, and development among its member countries through policy guidelines.

Question 6:
IUPAC name of PCM (Paracetamol)
Explanation: The IUPAC name of paracetamol (PCM) is N-(4-hydroxyphenyl)acetamide or ethanamide. It is a widely used analgesic and antipyretic.

Question 7:
Tetracycline causes which syndrome
Explanation: Tetracycline, when degraded or outdated, can cause Fanconi syndrome, a kidney disorder affecting reabsorption in the proximal tubule, leading to electrolyte imbalance.

Question 8:
Clerk formula
Explanation: Clark's formula calculates pediatric doses: (Weight in pounds / 150) × Adult dose. It estimates the appropriate child dosage based on weight.

Question 9:
Baudouin test used for
Explanation: Baudouin test detects sesame oil adulteration in fats and oils. It involves the formation of a pink-red color with hydrochloric acid.

Question 10:
Surface tension can be found by which method
Explanation: Surface tension can be measured using the capillary rise method or drop count method, which analyze liquid behavior under capillary or drop formation.

Question 11:
Liebermann–Burchard test is used for identification of
Explanation: The Liebermann–Burchard test identifies cholesterol and steroids. A green-blue color change indicates the presence of these compounds due to chemical reactions with reagents.

Question 12:
Western blot used to detect
Explanation: Western blot detects specific proteins in a sample using gel electrophoresis followed by antibody binding, commonly used in diagnostics and research.

Question 13:
Number of stereoisomers for tartaric acid
Explanation: Tartaric acid has three stereoisomers: two enantiomers (D and L forms) and one meso form, which is optically inactive due to internal symmetry.

Question 14:
Full form of CMC
Explanation: CMC stands for Carboxymethyl Cellulose. It is used as a thickener, stabilizer, and suspending agent in pharmaceuticals, food, and cosmetics.

Question 15:
Organ of Corti is part of

Explanation: The organ of Corti is located in the cochlea of the inner ear. It contains hair cells responsible for converting sound vibrations into nerve impulses.

Question 16:
Triphala consists of which ingredients
Explanation: Triphala is an Ayurvedic formulation composed of three fruits: Emblica officinalis (Amla), Terminalia belerica (Bahera), and Terminalia chebula (Haritaki). It is used for digestion, detoxification, and rejuvenation.

Question 17:
Which immunoglobulin involved in hypersensitivity
Explanation: IgE is the immunoglobulin responsible for Type I hypersensitivity reactions like asthma, hay fever, and anaphylaxis. It binds allergens and triggers mast cell degranulation.

Question 18:
Which immunoglobulin crosses the placenta
Explanation: IgG is the only immunoglobulin that crosses the placenta, providing passive immunity to the fetus by protecting against infections during pregnancy.

Question 19:
Curcumin contains
Explanation: Curcumin, the active component of turmeric, is a diaryl heptanoid. It has anti-inflammatory, antioxidant, and anticancer properties, and is chemically classified as a polyphenol.

Question 20:
Separation of optical isomers is called
Explanation: The process of separating a racemic mixture into its enantiomers is called resolution. This is important in drug synthesis as different isomers can have different activities.

Question 21:
Aldosterone antagonists
Explanation: Drugs such as spironolactone, eplerenone, and finerenone act as aldosterone antagonists. They are used to treat conditions like heart failure, hypertension, and hyperaldosteronism.

Question 22:
Ergot alkaloid obtained from
Explanation: Ergot alkaloids are obtained from the fungus Claviceps purpurea, which grows on rye. These compounds are used in migraine and to induce labor.

Question 23:
Example of GLP-1 agonist
Explanation: GLP-1 agonists like exenatide, liraglutide, and dulaglutide mimic incretin hormones. They enhance insulin secretion and are used in the treatment of type 2 diabetes.

Question 24:
McLafferty rearrangement

Explanation: McLafferty rearrangement is a fragmentation pattern seen in mass spectrometry. It involves the transfer of a hydrogen atom followed by cleavage near a carbonyl group.

Question 25:
BZD antagonist
Explanation: Flumazenil is a benzodiazepine (BZD) antagonist that competitively inhibits BZD receptors. It is used to reverse BZD sedation or overdose effects.

Question 26:
Muscarinic receptor present on heart
Explanation: The M2 muscarinic receptor is located in the heart. Activation decreases heart rate and contractility by inhibiting adenylate cyclase and reducing cAMP levels.

Question 27:
USP syrup contains
Explanation: According to the United States Pharmacopeia (USP), simple syrup contains 85% w/v sucrose in purified water and is used as a sweetening agent.

Question 28:
USP type 2 dissolution apparatus
Explanation: The USP type 2 dissolution apparatus is known as the paddle type. It is commonly used to test drug release from tablets and capsules.

Question 29:
Mosquito repellent oil examples
Explanation: Citronella oil, extracted from Cymbopogon species, is a common natural mosquito repellent. It masks human scents and repels insects effectively.

Question 30:
HIV (AIDS) belongs to a class of viruses known
Explanation: HIV is classified as a retrovirus. It uses reverse transcriptase to convert its RNA genome into DNA, which integrates into the host genome.

Question 31:
Which among the following is RNA-dependent DNA polymerase
Explanation: Reverse transcriptase is an enzyme used by retroviruses like HIV. It synthesizes complementary DNA (cDNA) from an RNA template, enabling viral integration into the host genome.

Question 32:
……. is used to separate amino acids
Explanation: Paper chromatography is commonly used to separate amino acids. The technique relies on differences in solubility and movement of compounds across paper under solvent flow.

Question 33:
State of matter in mass spectroscopy
Explanation: In mass spectrometry, the sample is analyzed in the **gaseous state**. Molecules are ionized and fragmented in gas phase for detection based on mass-to-charge ratio.

Question 34:
Electrospray ionization is a common interface in
Explanation: Electrospray ionization (ESI) is a soft ionization technique used in **LC/MS (liquid chromatography-mass spectrometry)**. It allows analysis of large biomolecules like proteins and peptides.

Question 35:
Signals observed in acetone in proton NMR
Explanation: Acetone (CH_3COCH_3) shows **one** singlet signal in ^1H NMR due to chemical equivalence of all six protons in the two methyl groups.

Question 36:
……. shows the process of creating something new
Explanation: Innovation refers to creating new ideas, methods, or products. It plays a critical role in research, development, and problem-solving across industries and disciplines.

Question 37:
Umbelliferone present in
Explanation: Umbelliferone, a type of coumarin, is found in **asafoetida**. It exhibits antioxidant and antimicrobial properties and is used in herbal remedies and food flavoring.

Question 38:
Assets don't include
Explanation: Loans taken from others (e.g., loan from XYZ) are **liabilities**, not assets. Assets refer to resources owned by an entity that have economic value.

Question 39:
R and S are the configuration of
Explanation: R and S denote **absolute configurations** of chiral centers in enantiomers. They follow Cahn-Ingold-Prelog priority rules to define spatial arrangement of substituents.

Question 40:
The phytopharmaceutical approval for treatment of peptic ulcer
Explanation: Liquorice (Glycyrrhiza glabra) or Ginkgo biloba extracts have been studied for **phytopharmaceutical** use in managing **peptic ulcers** due to their mucosal protective properties.

Question 41:
Indian gooseberry
Explanation: Indian gooseberry is commonly known as **Amla**. It is rich in vitamin C and used traditionally for immunity, digestion, and as an antioxidant.

Question 42:
COOH is an
Explanation: The **carboxyl group (COOH)** is an **electron-withdrawing group** due to its electronegative oxygen atoms. It influences reactivity in electrophilic and nucleophilic substitution reactions.

Question 43:
Schedule C contains

Explanation: Schedule C of the Drugs and Cosmetics Act includes **biological products** like vaccines, toxins, antigens, and sera that require special regulatory oversight.

Question 44:
Noscapine is
Explanation: Noscapine is a **non-narcotic antitussive** alkaloid derived from opium poppy. It suppresses cough reflex without addictive or analgesic effects.

Question 45:
Doxorubicin mechanism
Explanation: Doxorubicin acts by **intercalating into DNA** and inhibiting **topoisomerase II**, preventing replication and repair. This leads to cytotoxicity, especially in cancer cells.

Question 46:
Doxorubicin causing toxicity in
Explanation: Doxorubicin causes **cardiotoxicity**, especially at high cumulative doses. It generates free radicals in cardiac tissue, leading to irreversible damage and heart failure.

Question 47:
Paclitaxel obtained from
Explanation: Paclitaxel is a natural anticancer drug isolated from the **Pacific yew tree (Taxus brevifolia)**. It stabilizes microtubules, inhibiting cell division.

Question 48:
Non-biodegradable polymer
Explanation: Polyethylene is a common **non-biodegradable** synthetic polymer used in packaging. It resists microbial degradation and accumulates in the environment.

Question 49:
…….. cause fever
Explanation: Pyrogens, usually bacterial endotoxins, stimulate the hypothalamus to increase body temperature. They're critical to detect in parenteral preparations to ensure safety.

Question 50:
The knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, used in the maintenance of health
Explanation: This defines **traditional medicine**, encompassing systems like Ayurveda, Unani, and folk remedies, often passed down generations and used alongside or before modern medicine.

Question 51:
Antiepileptic drug safe in pregnancy
Explanation: Lamotrigine, **levetiracetam**, and **carbamazepine** are relatively safer antiepileptic drugs during pregnancy. They have lower teratogenic risk compared to others like valproate.

Question 52:
Contraceptive pills may be ineffective with
Explanation: Rifampicin induces liver enzymes (CYP450), accelerating estrogen metabolism. This reduces contraceptive efficacy and may lead to unintended pregnancy.

Question 53:
Tesla is the unit of
Explanation: Tesla (T) is the SI unit of **magnetic field strength**. It measures the magnetic flux density in devices like MRI scanners.

Question 54:
Which vitamin is not derived from plants and animals
Explanation: Vitamin B_{12} (cyanocobalamin) is synthesized by microorganisms. It's not found in plants and must be obtained from animal products or supplements.

Question 55:
Creatinine clearance is used to study
Explanation: Creatinine clearance estimates **glomerular filtration rate (GFR)** and is a key indicator of **renal function**, used to adjust drug dosing.

Question 56:
Organization structure is relationship between
Explanation: Organization structure defines the **relationship among people, work, and resources** in a company. It clarifies roles, authority, and communication flow.

Question 57:
Which alkaloid does not give positive test with Dragendorff reagent
Explanation: Caffeine is a purine alkaloid and often fails to react with **Dragendorff reagent**, which detects alkaloids forming precipitates.

Question 58:
HLB value 7–9 for
Explanation: HLB (Hydrophilic-Lipophilic Balance) values of **7–9** indicate **wetting and spreading agents**, suitable for oil-in-water emulsions or topical applications.

Question 59:
Which of the following is not a vegetable oil
Explanation: Petroleum oil is mineral-based and not obtained from plants. Vegetable oils are plant-derived triglycerides like olive or coconut oil.

Question 60:
What is the purpose of preclinical testing in animals
Explanation: Preclinical animal studies assess a drug's **safety, toxicity, and efficacy** before human trials. They help predict human responses and determine starting doses.

Question 61:
What is the duration of phase 2 clinical trial
Explanation: Phase 2 clinical trials typically last **about 2 years**. They evaluate drug **efficacy and side effects** in a larger patient group after initial safety is confirmed in Phase 1.

Question 62:
What is the purpose of lecithin in cosmetics hair shampoos
Explanation: Lecithin acts as a **conditioning agent** in shampoos. It moisturizes, strengthens hair, and improves texture by forming a protective film on the hair shaft.

Question 63:
Lock and key model for the enzyme is given by
Explanation: The **lock and key model** was proposed by **Emil Fischer**. It describes enzyme-substrate interaction where the substrate fits perfectly into the active site.

Question 64:
Which of the following is a correct statement about non-linear pharmacokinetics
Explanation: In **non-linear pharmacokinetics**, drug concentration changes are **disproportionate** to dose changes due to saturation of metabolism, transport, or protein binding.

Question 65:
What is source of penicillin for large scale industrial production
Explanation: Penicillium chrysogenum is the industrial source of penicillin. It replaced P. notatum due to higher yield and better fermentation properties.

Question 66:
Why castor oil is used in lipstick preparation
Explanation: Castor oil is used as a **base** in lipstick formulations. It provides gloss, smooth application, and acts as a carrier for pigments.

Question 67:
Methylation of alcoholic group and acylation of phenolic group in morphine leads to
Explanation: Modifying morphine by **methylation and acylation** yields **heroin** (diacetylmorphine), which is more lipophilic and crosses the blood-brain barrier more rapidly.

Question 68:
Capital budget is which type of budget
Explanation: A **capital budget** is an **annual budget** that outlines long-term investments and expenditures on assets like equipment, buildings, or infrastructure.

Question 69:
Which immunoglobulin can cross the BBB
Explanation: IgG can cross the **blood-brain barrier** in limited amounts. It's used in immunotherapy and passive immunization against central nervous system infections.

Question 70:
Following members are part of top-level management team except
Explanation: Project managers or accountants are generally not considered top-level management. Top management includes roles like CEO, director, and vice president.

Question 71:
Antidote used in organophosphate poisoning
Explanation: Pralidoxime (2-PAM) reactivates acetylcholinesterase inhibited by organophosphates. It's used along with atropine to reverse toxic effects of nerve agents or pesticides.

Question 72:
Borax is used in cold cream as

Explanation: Borax acts as an **emulsifying agent** in cold creams by reacting with fatty acids to form soap, stabilizing the emulsion.

Question 73:
Human resources is also known as
Explanation: Human resources is also termed **personnel** or **talent management**, responsible for recruitment, training, performance appraisal, and organizational development.

Question 74:
Which is aldosterone antagonist
Explanation: Spironolactone is a well-known **aldosterone antagonist** that blocks sodium retention and potassium excretion, used in hypertension, heart failure, and hyperaldosteronism.

Question 75:
Film former used in nail polish is
Explanation: Nitrocellulose is the main **film-forming agent** in nail polish. It provides a smooth, glossy, and durable finish on the nail surface.

Continuing from **Question 76**, with concise 50-word explanations:

Question 76:
Which plant is used for toothache
Explanation: Clove (Syzygium aromaticum) is traditionally used to relieve toothache. Its active compound **eugenol** has anesthetic and antiseptic properties that numb pain and reduce inflammation.

Question 77:
Sweetness of which compound is 200 times more than glucose
Explanation: Aspartame is an artificial sweetener approximately **200 times sweeter** than glucose. It's used in sugar-free products and has low caloric value.

Question 78:
Neurotransmitter for preganglionic nerve in sympathetic nervous system
Explanation: Acetylcholine is released by **preganglionic sympathetic neurons**. It binds to nicotinic receptors on postganglionic neurons, initiating further neurotransmission.

Question 79:
Phentolamine is a competitive non-selective antagonist of
Explanation: Phentolamine blocks both **alpha-1 and alpha-2 adrenergic receptors**, causing vasodilation. It is used to manage hypertensive crises and pheochromocytoma.

Question 80:
Free flowing powder has …….. angle of repose
Explanation: Powders with an **angle of repose less than 20°** are considered **free flowing**. Lower angles indicate better flowability for manufacturing and packaging.

Question 81:
Direct visual reading of flow of fluids is obtained by

Explanation: A **rotameter** gives a **direct visual reading** of fluid flow rate using a float inside a tapered tube. It's used in labs and industry.

Question 82:
Primary standard for Karl Fischer titration
Explanation: Sodium tartrate dihydrate is a **primary standard** for Karl Fischer titration. It contains a known amount of water, ideal for calibrating the method.

Question 83:
Which drug can cause postural hypotension
Explanation: Diuretics and **calcium channel blockers** may cause **postural hypotension** (a drop in blood pressure on standing), leading to dizziness or fainting.

Question 84:
Which compound is used to prepare the TLC plate
Explanation: Silica gel is the most common adsorbent used to coat **TLC plates**, providing a polar stationary phase for compound separation.

Question 85:
Globar source of IR is
Explanation: A **globar** is an **infrared radiation source** made of **silicon carbide**. It emits IR radiation when electrically heated and is used in IR spectroscopy.

Question 86:
Virus has
Explanation: Viruses may have **either DNA or RNA**, but never both. These nucleic acids can be single or double-stranded, enclosed in a protein coat.

Question 87:
Subcoating of tablet is performed to
Explanation: Subcoating is applied in sugar coating processes to **round the tablet edges** and provide a smooth surface for subsequent layers.

Question 88:
Halofantrine is used in
Explanation: Halofantrine is an antimalarial drug used to treat **Plasmodium falciparum** malaria. It acts by interfering with the parasite's DNA replication.

Question 89:
NSAIDs belonging to category of para-amino phenol
Explanation: Acetaminophen (Paracetamol) is classified as a **para-aminophenol derivative**. It has analgesic and antipyretic effects but weak anti-inflammatory action.

NIPER 2020 Question Paper with Solutions

Question 1:
Which of the following is a cytokine inhibitor used as an anti-inflammatory?
(A) Nimesulide
(B) Abatacept

(C) Diclofenac
(D) Nabumetone

Answer: The correct answer is option (B), Abatacept.
Explanation: Abatacept is a biologic DMARD that inhibits T-cell activation by interfering with cytokine signaling, making it effective in treating autoimmune and inflammatory conditions like rheumatoid arthritis.

Question 2:
Remdesivir interferes with the action of which viral enzyme?
(A) RNA-dependent RNA polymerase
(B) Exoribonuclease
(C) DNA-dependent RNA polymerase
(D) DNA gyrase

Answer: The correct answer is option (A), RNA-dependent RNA polymerase.
Explanation: Remdesivir is an antiviral drug that inhibits viral replication by targeting the RNA-dependent RNA polymerase, an essential enzyme for RNA virus replication, including SARS-CoV-2.

Question 3:
Captisol is an excipient based on:
(A) PLA polymer
(B) PLGA polymer
(C) Cyclodextrin
(D) PEG

Answer: The correct answer is option (C), Cyclodextrin.
Explanation: Captisol is a modified cyclodextrin used to enhance the solubility and stability of poorly soluble drugs, improving drug delivery and formulation performance.

Question 4:
6-Fluoro-3-oxo-3,4-dihydro-2-pyrazine carboxamide is the IUPAC name of which drug?
(A) Ritonavir
(B) Favipiravir
(C) Remdesivir
(D) Pyrazinamide

Answer: The correct answer is option (B), Favipiravir.
Explanation: Favipiravir is an antiviral drug primarily used to treat influenza and is under study for other viral infections. Its IUPAC name reflects the fluorinated pyrazine carboxamide structure.

Question 5:
This reaction mechanism is favored by 3° substrates, low temperatures, polar solvents, and low concentrations of very weak bases.
(A) E1
(B) E2

(C) SN1
(D) SN2

Answer: The correct answer is option (C), SN1.
Explanation: The SN1 mechanism is favored by tertiary substrates, polar protic solvents, and weak nucleophiles. It proceeds via a carbocation intermediate, making it ideal under these conditions.

Question 6:
Who is the recipient of the 'World Entrepreneur of the Year' award for 2020?
(A) Vivekchand Sehgal
(B) Siddarth Lal
(C) Kiran Mazumdar-Shaw
(D) Rahul Bajaj

Answer: The correct answer is option (C), Kiran Mazumdar-Shaw.
Explanation: Kiran Mazumdar-Shaw, the Executive Chairperson of Biocon, received the World Entrepreneur of the Year award in 2020 for her significant contributions to the biotech industry and global healthcare.

Question 7:
In one of the following sulfonamides, the pyrimidine ring is absent. Which is it?
(A) Sulfosimidine
(B) Sulfadimidine
(C) Sulfadoxine
(D) Sulfisoxazole

Answer: The correct answer is option (D), Sulfisoxazole.
Explanation: Sulfisoxazole lacks the pyrimidine ring in its structure, unlike sulfosimidine, sulfadimidine, and sulfadoxine, which contain it.

Question 8:
Histamine structure is represented by:
(A) 3,4-Dihydroxyphenethylamine
(B) 2-(1-H-Imidazol-5-yl)ethanamine
(C) 2-(1-H-Imidazol-4-yl)ethanamine
(D) 2-Amino-3-(1H-imidazol-4-yl)propanoic acid

Answer: The correct answer is option (C), 2-(1-H-Imidazol-4-yl)ethanamine.
Explanation: Histamine is structurally a biogenic amine with an imidazole ring attached to an ethylamine side chain, specifically 2-(1-H-Imidazol-4-yl)ethanamine.

Question 9:
P2Y12 is a chemoreceptor for adenosine diphosphate (ADP) that:
(A) Mediates platelet aggregation
(B) Mediates WBC stimulation
(C) Binds to clopidogrel reversibly
(D) Mediates fibrinolysis

Answer: The correct answer is option (A), Mediates platelet aggregation.
Explanation: The P2Y12 receptor, found on platelets, is activated by ADP and plays a key role in platelet aggregation. It is a target of antiplatelet drugs like clopidogrel.

Question 10:
Neopentane and 2-methylbutane are which type of isomers?
(A) Positional isomers
(B) Chain isomers
(C) Isomers
(D) Diastereoisomers

Answer: The correct answer is option (B), Chain isomers.
Explanation: Neopentane and 2-methylbutane differ in the carbon chain structure but have the same molecular formula, making them chain isomers.

Question 11:
Which activity (the signal transduction pathway) of metformin is responsible for the inhibitory effect on glucose production by liver cells?
(a) Activation of AMPK
(b) Inhibition of hormone-sensitive lipase
(c) Inhibition of mammalian target of rapamycin (mTOR)
(d) Allosteric regulation by binding to a crucial section of the DNA that makes proteins needed for glucose uptake

Answer: The correct answer is option (a), Activation of AMPK.
Explanation: Metformin inhibits hepatic glucose production primarily by activating AMP-activated protein kinase (AMPK), which plays a key role in cellular energy homeostasis and suppresses gluconeogenesis in liver cells.

Question 12:
Single-letter code for pyrrolysine is:
(a) P
(b) J
(c) O
(d) Y

Answer: The correct answer is option (c), O.
Explanation: Pyrrolysine is a rare amino acid found in some methanogenic archaea and bacteria, and its single-letter code is "O".

Question 13:
Which bacterial enzyme helps the survival of *Helicobacter pylori* in the stomach?
(a) carbonic anhydrase
(b) urease
(c) β-lactamase
(d) transpeptidase

Answer: The correct answer is option (b), urease.
Explanation: *H. pylori* produces urease, which hydrolyzes urea into ammonia and carbon

dioxide, neutralizing stomach acid and allowing survival in the acidic environment.

Question 14:
Which of the following amino acids cannot provide a substrate for gluconeogenesis?
(a) Leucine
(b) Tryptophan
(c) Histidine
(d) Isoleucine

Answer: The correct answer is option (a), Leucine.
Explanation: Leucine is a purely ketogenic amino acid and cannot be converted into glucose, hence, it does not serve as a substrate for gluconeogenesis.

Question 15:
^{1}H NMR spectra recorded in $CDCl_3$ solution typically show a resonance at 7.24 ppm. What is this resonance due to?
(a) water
(b) trace HC
(c) Chloroform
(d) exchangeable protons

Answer: The correct answer is option (c), Chloroform.
Explanation: The peak at 7.24 ppm in ^{1}H NMR when using $CDCl_3$ as solvent is due to the residual non-deuterated chloroform ($CHCl_3$).

Question 16:
Favipiravir, tested as a COVID-19 treatment, is a product of which company?
(a) Fujifilm
(b) AstraZeneca
(c) Safoni team
(d) Takeda

Answer: The correct answer is option (a), Fujifilm.
Explanation: Favipiravir, an antiviral drug repurposed during the COVID-19 pandemic, was developed by Toyama Chemical, a subsidiary of Fujifilm.

Question 17:
The drug of choice for Torsades de pointes treatment is:
(a) Sotalol
(b) Ibutilide
(c) Disopyramide
(d) Magnesiums

Answer: The correct answer is option (d), Magnesiums.
Explanation: Intravenous magnesium sulfate is the drug of choice for treating Torsades de pointes, regardless of the patient's serum magnesium level.

Question 18:
^{13}C chemical shift has a much wider range (<300 ppm) than ^{1}H (<10 ppm) because:
(a) The contribution of the diamagnetic shielding of ^{13}C is much larger than ^{1}H due to the

small ^{13}C energy
(b) The contribution of the paramagnetic shielding of ^{13}C is much larger than ^{1}H due to the small ^{13}C energy
(c) The electron density of ^{1}H is usually spherically symmetrical
(d) The reason is unknown

Answer: The correct answer is option (b), The contribution of the paramagnetic shielding of ^{13}C is much larger than ^{1}H due to the small ^{13}C energy.
Explanation: The wider chemical shift range in ^{13}C NMR arises from the increased influence of paramagnetic shielding, which is more pronounced due to the smaller energy gap between ground and excited states in ^{13}C.

Question 19:
Which of the following drugs reduces LDL cholesterol by inhibiting an intestinal transport protein?
(a) atorvastatin
(b) cholestyramine
(c) ezetimibe
(d) gemfibrozil

Answer: The correct answer is option (c), ezetimibe.
Explanation: Ezetimibe lowers LDL cholesterol by selectively inhibiting the Niemann-Pick C1-Like 1 (NPC1L1) protein in the small intestine, thereby reducing cholesterol absorption.

Question 20:
The least abundant amino acid in human proteins is:
(a) Leucine
(b) Lysine
(c) Cysteine
(d) Tyrosine

Answer: The correct answer is option (c), Cysteine.
Explanation: Cysteine is among the least abundant amino acids in human proteins due to its unique sulfur-containing side chain and involvement in disulfide bond formation.

Question 21:
Arrange in the order of increasing basicity: piperidine, pyrrole, pyrimidine, morpholine
(a) Piperidine > pyrrole > pyrimidine > morpholine
(b) Pyrrole > piperidine > morpholine > pyrimidine
(c) Pyrimidine > piperidine > morpholine > pyrrole
(d) Piperidine > morpholine > pyrimidine > pyrrole

Answer: The correct answer is option (d), Piperidine > morpholine > pyrimidine > pyrrole.
Explanation: Basicity is influenced by electron availability. Piperidine, a saturated amine, is most basic, followed by morpholine, pyrimidine (aromatic nitrogen-containing ring), and least is pyrrole due to delocalized electrons.

Question 22:
Which of the following diseases is NOT associated with coronavirus?

(a) SARS-CoV-1
(b) MERS
(c) COVID-19
(d) Swine flu

Answer: The correct answer is option (d), Swine flu.
Explanation: Swine flu is caused by the influenza A H1N1 virus, not by a coronavirus. SARS-CoV-1, MERS, and COVID-19 are all caused by different strains of coronavirus.

Question 23:
IUPAC name of Carbamazepine is:
(A) 5H-dibenzo[b,e]azepine-5-carboxamide
(B) 5H-dibenzo[b,f]azepine-5-carboxamide
(C) 5H-dibenzo[b,g]oxepine-5-carboxamide
(D) 5H-dibenzo[b,d]azepine-5-carboxamide

Answer: (B) 5H-dibenzo[b,f]azepine-5-carboxamide
Explanation: This is the correct IUPAC name for Carbamazepine, a widely used anticonvulsant and mood-stabilizing drug.

Question 24:
Which of the following alkaloids is derived from tyrosine?
(A) Quinine
(B) Morphine
(C) Atropine
(D) Vinca alkaloid

Answer: (B) Morphine
Explanation: Morphine is a phenanthrene alkaloid biosynthesized from tyrosine via the benzylisoquinoline pathway.

Question 25:
Carvedilol is a mixture of how many enantiomers?
(A) 2
(B) 4
(C) 6
(D) 8

Answer: (A) 2
Explanation: Carvedilol is a racemic mixture containing two enantiomers—S(-) and R(+).

Question 26:
Why is DSS used instead of TMS as the ^{1}H chemical shift reference for a biological sample?
(A) TMS can denature proteins
(B) The chemical shift of TMS is dependent on temperature
(C) DSS has a higher solubility in aqueous solution
(D) DSS is widely used in protein sample preparation

Answer: (C) DSS has a higher solubility in aqueous solution
Explanation: DSS (2,2-dimethyl-2-silapentane-5-sulfonate) is used in NMR for aqueous

systems due to its better solubility compared to TMS.

Question 27:
Which international clinical trial was launched by WHO and partners to help find an effective treatment for COVID-19?
(A) Solidarity
(B) Dissidence
(C) Severance
(D) Dissension

Answer: (A) Solidarity
Explanation: The Solidarity trial was launched by the WHO to evaluate potential treatments for COVID-19 quickly and globally.

Question 28:
Lupron implant is an example of:
(A) Erodible implant
(B) Implant pump
(C) Both (A) and (B)
(D) None of these

Answer: (A) Erodible implant
Explanation: Lupron Depot is an erodible implant that releases leuprolide acetate for hormone therapy.

Question 29:
The full form of COVID-19 is:
(A) Co-viral disease-19
(B) Coronavirus disorder-19
(C) Corona Virus disease-19
(D) Coronavirus deficiency syndrome-19

Answer: (C) Coronavirus disease-19
Explanation: COVID-19 stands for Coronavirus Disease 2019.

Question 30:
For maximum bioavailability, a drug should be targeted at:
(A) Stomach
(B) Small intestine
(C) Large intestine
(D) Colon

Answer: (B) Small intestine
Explanation: The small intestine has the largest surface area and favorable conditions for drug absorption, leading to higher bioavailability.

Question 31:
Which of the following viruses is not named on the basis of geographical location?
(a) MERS and Ebola
(b) Zika and West Nile virus

(c) Marburg
(d) Rubella

Answer: The correct answer is option (d), Rubella.
Explanation: Rubella is not named after a geographical location; its name is derived from Latin, meaning “little red.” The others are named after places where they were first identified.

Question 32:
Hand-foot syndrome (palmar-plantar erythrodysesthesia) is NOT caused by:
(a) 5-fluorouracil
(b) capecitabine
(c) mitomycin
(d) doxorubicin

Answer: The correct answer is option (c), mitomycin.
Explanation: Hand-foot syndrome is commonly associated with 5-fluorouracil, capecitabine, and doxorubicin. Mitomycin does not typically cause this condition.

Question 33:
Cimetidine acts by blocking:
(a) Na-H-ATPase
(b) Na-K ATPase
(c) H_2 receptor
(d) H_1 receptor

Answer: The correct answer is option (c), H_2 receptor.
Explanation: Cimetidine is a histamine H_2 receptor antagonist that reduces stomach acid secretion by blocking H_2 receptors on gastric parietal cells.

Question 34:
Nerve gases used as warfare agents are:
(a) SARIN
(b) TABUN
(c) SOMAN
(d) All of the above

Answer: The correct answer is option (d), All of the above.
Explanation: SARIN, TABUN, and SOMAN are all organophosphorus compounds used as chemical warfare agents that inhibit acetylcholinesterase.

Question 35:
One-letter symbol of Arginine is:
(a) K
(b) A
(c) R
(d) D

Answer: The correct answer is option (c), R.
Explanation: The one-letter code for the amino acid Arginine is "R".

Question 36:
First Indian pharma company:
(a) Alembic Chemical Works
(b) Bengal Chemicals and Pharmaceuticals
(c) Cipla
(d) Dabur India Ltd

Answer: The correct answer is option (b), Bengal Chemicals and Pharmaceuticals.
Explanation: Founded by Acharya Prafulla Chandra Ray in 1901, Bengal Chemicals and Pharmaceuticals is the first pharmaceutical company in India.

Question 37:
For a drug following linear pharmacokinetics, what would be the change in tmax if the oral dose of the drug is doubled?
(a) tmax remains unchanged
(b) tmax doubled
(c) tmax decreased to half
(d) Cannot be predicted

Answer: The correct answer is option (a), tmax remains unchanged.
Explanation: In linear pharmacokinetics, tmax is independent of dose and remains unchanged when the dose is doubled.

Question 38:
Which isomer(s) of xylene will exhibit 3 peaks in the ^{13}C NMR spectrum?
(a) o-xylene
(b) m-xylene
(c) p-xylene
(d) All of the above

Answer: The correct answer is option (c), p-xylene.
Explanation: Due to symmetry, p-xylene shows only 3 unique carbon environments in its ^{13}C NMR spectrum.

Question 39:
Which of the following drug transport mechanisms across the cell membrane is bidirectional in nature?
(a) Passive diffusion
(b) Active transport
(c) Pinocytosis
(d) Facilitated diffusion

Answer: The correct answer is option (c), Pinocytosis.
Explanation: Pinocytosis is an endocytic process that can allow fluid and dissolved substances to move in and out, making it bidirectional under certain conditions.

Question 40:
A thermodynamically-controlled reaction will yield predominantly the:
(a) product whose formation requires the smallest free energy of activation.

(b) more/most stable product
(c) The product that can be formed in the fewest steps.
(d) The product that is formed at the fastest rate.

Answer: The correct answer is option (b), more/most stable product.
Explanation: In thermodynamic control, the product distribution depends on product stability rather than the rate of formation.

Question 41:
The dielectric constant of water at 25°C is
(a) 1.0006
(b) 2.25
(c) 78.2
(d) 100

Answer: The correct answer is option (c), 78.2.
Explanation: Water has a high dielectric constant of around 78.2 at 25°C, which contributes to its strong polarity and ability to dissolve ionic compounds.

Question 42:
Medical devices are notified as DRUGS under the Drugs & Cosmetics Act. Schedule for Medical devices GMP requirements are specified under
(a) Schedule M III
(b) Schedule M-II
(c) Schedule M-I
(d) Schedule M

Answer: The correct answer is option (a), Schedule M III.
Explanation: Schedule M III of the Drugs and Cosmetics Act specifies Good Manufacturing Practice (GMP) requirements for medical devices.

Question 43:
Which of the following is not true for a patent?
(a) Monopoly
(b) Exclusivity
(c) Disclosure
(d) Indefinite term

Answer: The correct answer is option (d), Indefinite term.
Explanation: Patents are granted for a fixed period (generally 20 years), not indefinitely. They provide exclusive rights in exchange for public disclosure.

Question 44:
Margaret Dayhoff developed the first protein sequence database named
(a) SWISS PORT
(b) Protein sequence database
(c) Protein Data Bank PDB
(d) Atlas of protein sequence and structure

Answer: The correct answer is option (d), Atlas of protein sequence and structure.
Explanation: Margaret Dayhoff is credited with creating the first comprehensive protein sequence database, known as the "Atlas of Protein Sequence and Structure".

Question 45:
Haloperidol belongs to
(a) Azaspirodecanedione antidepressant
(b) Opioid analgesic
(c) Butyrophenone antipsychotic
(d) Quinoline antipsychotic

Answer: The correct answer is option (c), Butlyraphenone antipsychotic.
Explanation: Haloperidol is a typical antipsychotic drug belonging to the butyrophenone class.

Question 46:
Acute decrease in response to a drug after initial or repeated intake is known as which of the following drug interactions?
(a) Additive
(b) Permissive
(c) Synergetic
(d) Tachyphylaxis

Answer: The correct answer is option (d), Tachyphylaxis.
Explanation: Tachyphylaxis refers to a rapid decrease in response to a drug after its administration over a short period.

Question 47:
Which of the following is an unusual feature of the replication cycle in coronaviruses?
(a) The RNAs all terminate in a common 3' and produce nested set transcripts
(b) They take advantage of recombination with the long RNA genome
(c) They are not highly mutable
(d) They use capped cellular mRNAs

Answer: The correct answer is option (a). The RNAs all terminate in a common 3' and produce nested set transcripts.
Explanation: Coronaviruses produce a nested set of subgenomic mRNAs with common 3’ ends, a unique replication feature.

Question 48:
Original X company sells its product under the name 'Phido'. Company Y begins to market an identical product under the name 'Fido'. This is a case of
(a) copyright infringement.
(b) patent infringement.
(c) trademark infringement.
(d) None of the above.

Answer: The correct answer is option (c), trademark infringement.
Explanation: Using a similar name that may confuse consumers falls under trademark

infringement.

Question 49:
In the Kjeldahl method, a sample containing nitrogen is digested with
(a) Conc. NaOH
(b) Fuming HNO_3
(c) Conc. H_2SO_4
(d) Strong NH_3 solution

Answer: The correct answer is option (c), Conc. H_2SO_4.
Explanation: Concentrated sulfuric acid digests the nitrogen-containing sample, converting nitrogen into ammonium sulfate.

Question 50:
Identify the fifth-generation cephalosporin.
(a) Ceftaroline
(b) Cefadroxil
(c) Cefotetan
(d) Cefipime

Answer: The correct answer is option (a), Ceftaroline.
Explanation: Ceftaroline is a fifth-generation cephalosporin effective against MRSA and other resistant organisms.

Question 51:
Who is the CEO of Dr. Reddy's Lab
(a) K. Anji Reddy
(b) Erez Israeli
(c) Ibrahim Alkazi
(d) Israel Makov

Answer: The Correct option is b
Explanation: Erez Israeli is the current CEO of Dr. Reddy’s Laboratories. He succeeded G.V. Prasad and brings global pharmaceutical leadership experience.

Question 52:
One degree Celsius is how many degrees Kelvin
(a) 273.15 K
(b) 274.15 K
(c) 33.8 K
(d) 1

Answer: The Correct option is d
Explanation: A change of 1°C is equivalent to a change of 1 K. (However, to convert from Celsius to absolute temperature in Kelvin, you add 273.15.)

Question 53:
Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) is a campaign launched by
(a) Prime Minister's Office
(b) Department of Health and Family Welfare, Ministry of Health and Family Welfare

(c) Department of Health Research, Ministry of Health and Family Welfare
(d) Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers

Answer: The Correct option is d
Explanation: PMBJP is implemented by the Department of Pharmaceuticals to provide quality generic medicines at affordable prices through dedicated stores.

Question 54:
The plot of 1/V versus 1/[S, where V is the rate of enzymatic reaction and [S] is substrate concentration, is known as
(a) Michaelis-Menten plot
(b) Lineweaver-Burk plot
(c) Hanes-Woolf plot
(d) Eadie-Hofstee plot

Answer: Correct option is b
Explanation: The Lineweaver-Burk plot is the double reciprocal plot used to determine kinetic parameters of enzyme reactions.

Question 55:
Camphor contains how many isoprene units
(a) One
(b) Two
(c) Three
(d) Four

Answer: The Correct option is b
Explanation: Camphor is a bicyclic monoterpenoid, which contains two isoprene units.

Question 56:
A diabetic patient developed cellulitis due to *Staphylococcus aureus*, which was found to be methicillin-resistant. All the following antibiotics will be appropriate EXCEPT
(a) Vancomycin
(b) Imipenem
(c) Teicoplanin
(d) Linezolid

Answer: The Correct option is b
Explanation: MRSA (Methicillin-resistant *Staphylococcus aureus*) is resistant to beta-lactams, including imipenem. The others are effective against MRSA.

Question 57:
Which of the proteins in the coronavirus is responsible for attachment to the host cell
(a) Spike
(b) Membrane
(c) Envelope
(d) Nucleocapsid

Answer: The Correct option is a
Explanation: The Spike (S) protein mediates attachment and fusion of the virus with the host

cell, making it critical for viral entry.

Question 58:
Lindlar's catalyst is
(a) Platinum chloride + calcium carbonate + lead acetate
(b) Palladium chloride + calcium carbonate + lead acetate
(c) Chromic acid + lead acetate
(d) Palladium(III) bis(acetylacetonate)

Answer: The Correct option is b
Explanation: Lindlar's catalyst is palladium deposited on calcium carbonate and poisoned with lead acetate. It is used for the selective hydrogenation of alkynes to cis-alkenes.

Question 59:
Three friends, A, B, and C, invested in a business in the ratio of 4:5:11. The investment is 1000 rupees. What will be the profit earned by A out of the total profit of Rs 100 earned within 2 days?
(a) 20
(b) 25
(c) 55
(d) 45

Answer: The Correct option is a
Explanation: Total ratio = 4 + 5 + 11 = 20; A's share = (4/20) × 100 = 20.

Question 60:
Who is the current DCGI
(a) VG Somani
(b) S. Eswara Reddy
(c) P. B. N. Prasad
(d) Ravi Kant Sharma

Answer: The Correct option is a
Explanation: As of the current official designation, Dr. V.G. Somani is the Drug Controller General of India (DCGI).

Question 61:
What is true about Autophagy
(a) can be considered a cell survival pathway as well as a cell death pathway
(b) might be activated when AMP-dependent kinase (AMPK) is inhibited
(c) could release branched-chain amino acids from muscle
(d) is associated with the movement of phosphatidyl serine to the outer leaflet

Answer: The Correct option is a
Explanation: Autophagy is a cellular process for degrading and recycling cellular components. It helps in survival during nutrient deprivation, but can also lead to cell death if overactivated.

Question 62:
Dr. Reddy's Lab will conduct Phase III studies of the vaccine in the country

(a) Sputnik V
(b) Moderna
(c) Sinovac
(d) IQVIA

Answer: The Correct option is a
Explanation: Dr. Reddy's Laboratories partnered with the Russian Direct Investment Fund to conduct Phase III trials of the Sputnik V COVID-19 vaccine in India.

Question 63:
Jarsch-Herxheimer reaction is due to
(a) Borrelia spirochetes
(b) Plasmodium vivax
(c) Herpes Virus
(d) Yersinia pestis

Answer: The Correct option is a
Explanation: Jarisch-Herxheimer reaction is an acute febrile reaction often seen after antibiotic treatment of spirochetal infections like syphilis and Lyme disease caused by *Borrelia*.

Question 64:
The financial status of the company at any given time can be analysed with
(a) Trading account
(b) Profit & Loss statement
(c) Balance Sheet
(d) Cash Book

Answer: The Correct option is c
Explanation: A balance sheet provides a snapshot of a company’s financial condition at a specific point in time, showing assets, liabilities, and equity.

Question 65:
Which heterocyclic rings are present in nicotine
(a) pyrimidine and pyrrole
(b) pyridine and pyrrolidine
(c) pyrimidine and imidazole
(d) Piperidine and Pyrrolidine

Answer: The Correct option is b
Explanation: Nicotine contains a pyridine ring and a pyrrolidine ring in its structure.

Question 66:
As per USP, the weight variation limit for a tablet of 250 mg is
(a) 10%
(b) 7.50%
(c) 5%
(d) 1.50%

Answer: The Correct option is b
Explanation: According to USP, tablets weighing 130–324 mg should not deviate more than ±7.5% in weight variation.

Question 67:
Methotrexate toxicity can be prevented by
(a) Leucovorin
(b) Mesna
(c) Oncovin
(d) $Na_2S_2O_3$

Answer: The Correct option is a
Explanation: Leucovorin (folinic acid) is used as a "rescue" therapy to prevent toxicity from methotrexate by replenishing folate pools.

Question 68:
Cell-mediated immunity is provided by all of the following EXCEPT
(a) Macrophages
(b) NK-cells
(c) T-lymphocytes
(d) B-lymphocytes

Answer: The Correct option is d
Explanation: B-lymphocytes are involved in humoral immunity (antibody production), not cell-mediated immunity.

Question 69:
MPTP, a prodrug, is converted to MPP^+ by an enzyme.
(a) MAO A
(b) MAO B
(c) DAO
(d) AChE

Answer: The Correct option is b
Explanation: MAO-B metabolizes MPTP into MPP^+, a neurotoxin that damages dopaminergic neurons and mimics Parkinson's disease

Question 70:
Which of the following phenomena in the cell membrane is energetically expensive and does not occur spontaneously
(a) The rotation of membrane proteins
(b) The rotation of phospholipids
(c) The lateral diffusion of phospholipids
(d) The flip-flop movement of phospholipids

Answer: The Correct option is d
Explanation: Flip-flop movement (transverse movement) of phospholipids requires enzymes (flippases) and energy because it involves moving across the bilayer.

Question 71:
My mother is twice as old as my brother. I am five years younger than my brother but three years older than my sister. If my sister is twelve years of age, how old is my mother?
(a) 50
(b) 40
(c) 30
(d) 24

Answer: The Correct option is b
Explanation: Sister = 12, so I = 15, Brother = 20,

Mother = 2 × 20 = 40.

Question 72:
An essential amino acid is one that
(a) is readily available in the body
(b) can be synthesized by the body
(c) It is essentially easy to synthesize
(d) cannot be synthesized by the body

Answer: The Correct option is d
Explanation: Essential amino acids cannot be synthesized by the body and must be obtained through the diet.

Question 73:
Which amino acid gives maximum UV absorption
(a) tryptophan
(b) tyrosine
(c) phenylalanine
(d) proline

Answer: The Correct option is a
Explanation: Tryptophan has the highest absorbance at 280 nm due to its indole ring, followed by tyrosine and phenylalanine.

Question 74:
Functional group determination can be done with
(a) IR spectroscopy
(b) NMR spectroscopy
(c) UV spectroscopy
(d) Mass spectrometry

Answer: The Correct option is a
Explanation: Infrared (IR) spectroscopy identifies functional groups based on characteristic vibrational frequencies.

Question 75:
Which of the following is a polysaccharide vaccine
(a) anthrax vaccine
(b) rabies vaccine

(c) hepatitis A
(d) Hib vaccine

Answer: The Correct option is d
Explanation: Haemophilus influenzae type B (Hib) vaccine is a conjugated polysaccharide vaccine used to protect against invasive disease caused by Hib.

Question 76:
A person travelled west 5 km, turned left and traveled 3 km, turned right and traveled 9 km. He then traveled North 3 km. How far was 'A' from the starting point now?
(a) 6
(b) 14
(c) 15
(d) 20

Answer: The Correct option is b
Explanation: Final position is 14 km from the starting point (horizontal displacement = 5 + 9 = 14 km, vertical displacement cancels as 3 km south and 3 km north).

Question 77:
Who is the chairman of the Fifteenth Finance Commission
(a) Shaktikanta Das
(b) N.K. Singh
(c) Gita Gopinath
(d) Viral Acharya

Answer: The Correct option is b
Explanation: N.K. Singh was the chairman of the Fifteenth Finance Commission of India.

Question 78:
Synonym of *abeyance*
(a) reserve
(b) depth
(c) abysmal
(d) abstinence

Answer: The Correct option is a
Explanation: *Abeyance* means temporary suspension or inactivity; synonym: *reserve* or *suspension*.

Question 79:
Bicuculline acts as
(a) Antagonist of GABAA
(b) Agonist of GABAA
(c) Agonist of nicotinic receptors
(d) Agonist of NMDA receptor

Answer: The Correct option is a
Explanation: Bicuculline is a competitive antagonist of the GABAA receptor, blocking the action of GABA and inducing seizures.

Question 80:
Which of the following is a water-soluble base
(a) Soft paraffin
(b) Hydroxyethylcellulose
(c) Cocoa butter
(d) Vaseline

Answer: The Correct option is b
Explanation: Hydroxyethylcellulose is a water-soluble polymer used as a base in aqueous formulations.

Question 81:
Remdesivir was originally created and developed in 2009 for hepatitis C infection by
(a) Gilead Sciences
(b) Takeda
(c) Toyama Chemical
(d) Novartis

Answer: The Correct option is a
Explanation: Gilead Sciences developed Remdesivir for hepatitis C; it was later repurposed for Ebola and COVID-19.

Question 82:
If the aim of these investigations is to determine the stability of a drug after opening of the package, what are the conditions?
(a) 40°C, 75% RH 0–6 months
(b) Room temp, 0–3 months
(c) Room temp, 0–24 hours
(d) Room temp, 0–4 weeks

Answer: The Correct option is d
Explanation: Stability studies post-opening are usually done at room temperature for short durations, such as 0–4 weeks.

Question 83:
Benzoic acid to benzoyl chloride conversion is achieved by
(a) Cl_2, hv
(b) SO_2, Cl_2
(c) PCl_5
(d) Cl_2, H_2O

Answer: The Correct option is c
Explanation: Benzoic acid reacts with phosphorus pentachloride (PCl_5) to form benzoyl chloride.

Question 84:
Mr. X took a loan for 6 years at the rate of 5% p.a. S.I. If the total interest paid was Rs. 1230, the principal amount was
(a) Rs. 4100

(b) Rs. 4920
(c) Rs. 5000
(d) Rs. 5300

Answer: The Correct option is a
Explanation:
$ \text{S.I.} = \frac{P \times R \times T}{100} $

$ \Rightarrow 1230 = \frac{P \times 5 \times 6}{100} $

$ \Rightarrow P = \frac{1230 \times 100}{5 \times 6} = \text{Rs. } 4100 $

Question 85:
A simple interest on a certain sum for 3 years is Rs. 225, and the compound interest on the same sum for 2 years is Rs. 165. Find the rate percent per annum.
(a) 20%
(b) 2.5%
(c) 5%
(d) 15%

Answer: The Correct option is a
Explanation: Using CI and SI formulas, the rate is calculated to be 20% p.a.

Question 86:
A person gets one rupee for each successful target hit, and one rupee is lost for each missed target. If total chances are 100 and earned rupees are 30, what is the number of successful attempts?
(a) 70
(b) 60
(c) 75
(d) 65

Answer: The Correct option is d
Explanation: $ \text{Let successful} = x $

$ \text{Missed} = 100 - x $

$ \text{Net earning} = x - (100 - x) = 2x - 100 = 30 $

$ \Rightarrow x = 65 $

Question 87:
The concentration given in grams equivalent per volume of solution is known as
(a) Molality
(b) Molarity
(c) Normality
(d) Mole fraction

Answer: The Correct option is c
Explanation: Normality is the number of gram equivalents per liter of solution.

Question 88:
Which of the following amino acids is not necessary to be taken in the diet
(a) histidine
(b) threonine
(c) serine
(d) lysine

Answer: The Correct option is c
Explanation: Serine is a non-essential amino acid; the body can synthesize it.

Question 89:
Self-assembled closed colloidal structures composed of lipid bilayers are called
(a) dendrimers
(b) polymers
(c) micelles
(d) liposomes

Answer: The Correct option is d
Explanation: Liposomes are vesicles made of lipid bilayers enclosing an aqueous compartment.

Question 90:
Which of the following drug delivery systems comprises a hydrophobic core and a hydrophilic surface
(a) Liposomes
(b) Micelles
(c) Reverse micelles
(d) None of the above

Answer: The Correct option is b
Explanation: Micelles are spherical structures with hydrophobic cores and hydrophilic surfaces, suitable for solubilizing lipophilic drugs.

Question 91:
Tamoxifen is classified as
(a) Antiprogestin
(b) Antiandrogen
(c) Antiestrogen
(d) Androgen

Answer: The Correct option is c
Explanation: Tamoxifen is a selective estrogen receptor modulator (SERM) that acts as an antiestrogen in breast tissue and is used in the treatment of estrogen receptor-positive breast cancer.

Question 92:
Among the butane conformers, which occur at energy minima on a graph of potential energy versus dihedral angle?
(a) Synperiplanar

(b) Antiperiplanar
(c) Gauche
(d) Eclipsed

Answer: The Correct option is b
Explanation: The antiperiplanar (also called anti) conformation of butane is the most stable and lies at a potential energy minimum due to minimized steric hindrance.

Question 93:
Which of the following antiflatulents is usually added to antacid?
(a) Alginic acid
(b) Sucralfate
(c) Simethicone
(d) Misoprostol

Answer: The Correct option is c
Explanation: Simethicone is an antiflatulent added to antacids to relieve bloating and gas by breaking up gas bubbles in the gut.

Question 94:
The dihydropyridines block which of the following types of calcium channels?
(a) L-type voltage-gated channels
(b) T-type voltage-gated channels
(c) N-type voltage-gated channels
(d) Ligand-gated calcium channels

Answer: The Correct option is a
Explanation: Dihydropyridines selectively block L-type calcium channels, mainly affecting vascular smooth muscle and leading to vasodilation.

Question 95:
Commonly, which reaction on the histones leads to the silencing of genes?
(a) Phosphorylation
(b) Methylation
(c) Acetylation
(d) Demethylation

Answer: The Correct option is b
Explanation: Methylation of histones, especially at certain lysine residues, is associated with gene silencing and chromatin compaction.

Question 96:
Baby shampoo contains which of the following surfactants as a detergent?
(a) Sodium lauryl sulphate
(b) Cationic surfactant
(c) Amphoteric imidazole derivatives (Miranda)
(d) Alkyl sulfonates

Answer: The Correct option is c
Explanation: Amphoteric imidazole derivatives are mild surfactants used in baby shampoos

to minimize eye and skin irritation.

Question 97:
If investment of Rs. X is done on simple interest, and the amount doubles in some years. What would be the rate of simple interest per annum?
(a) 10
(b) 12.5
(c) 20
(d) 25

Answer: The Correct option is c
Explanation: For an amount to double, SI = P. Using

$SI = \frac{P \times R \times T}{100} = P$

$\Rightarrow R \times T = 100$

$\text{If } T = 5 \text{ years, then } R = 20\%$

Question 98:
Find the synonym for 'chimera'.
(a) Chimney
(b) Protest
(c) Illusion
(d) Panache

Answer: The Correct option is c
Explanation: *Chimera* means an illusion or fabrication of the mind; something that is hoped for but is illusory or impossible.

Question 99:
Which of the following rings does ergoline contain?
(a) indolo [4,3-f g] quinoline
(b) indoloquinazoline
(c) β-carboline
(d) indolonaphthalene

Answer: The Correct option is a
Explanation: Ergoline contains an indolo[4,3-fg]quinoline ring system, characteristic of ergot alkaloids.

Question 100:
Which of the following cytokines is associated with pulmonary inflammation related to brain death?
(a) IL-2
(b) IL-6
(c) IL-5
(d) IL-8

Answer: The Correct option is b
Explanation: IL-6 is a pro-inflammatory cytokine involved in systemic inflammation, including that seen in brain death-associated pulmonary complications.

Question 101:
Who has been appointed as the head of the committee formed by the government to address the issues of drug security in the country in the context of the Novel Coronavirus outbreak?
(a) Vashishtha Narayan Singh
(b) Gita Mittal
(c) R.K. Mathur
(d) Eswara Reddy

Answer: The Correct option is d
Explanation: Dr. Eswara Reddy was appointed to head the committee addressing drug security during the COVID-19 crisis.

Question 102:
Recently, ranitidine, metformin were in the news due to the presence of which impurity?
(a) Nitrosodimethylamine
(b) Methylnitrile
(c) Diethylene glycol
(d) 4-aminobiphenyl

Answer: The Correct option is a
Explanation: NDMA (N-Nitrosodimethylamine), a probable human carcinogen, was found as an impurity in ranitidine and metformin.

Question 103:
Fries rearrangement reaction of phenol ester leads to the formation of which type of product?
(a) Alkene
(b) Aldehyde
(c) Alcohol
(d) Ketone

Answer: The Correct option is d
Explanation: Fries rearrangement converts aryl esters to hydroxyaryl ketones using Lewis acid catalysts.

Question 104:
In which medium does Favorskii rearrangement occur?
(a) Neutral
(b) Acidic
(c) Basic
(d) Amphiprotic

Answer: The Correct option is c
Explanation: Favorskii rearrangement of α-haloketones to carboxylic acids or esters proceeds in basic medium.

Question 105:
Glycine and proline are the most abundant amino acids in the structure of
(a) Hemoglobin
(b) Myoglobin
(c) Insulin
(d) Collagen

Answer: The Correct option is d
Explanation: Collagen, a structural protein, is rich in glycine and proline, which contribute to its triple-helical structure.

Question 106:
Which of the following is an opioid-like agonist?
(a) Phenobarbital
(b) Diltiazem
(c) Pemoline
(d) Propoxyphene

Answer: The Correct option is d
Explanation: Propoxyphene is a weak opioid agonist used for mild to moderate pain. It acts on opioid receptors similar to other narcotics.

Question 107:
Which of the following compounds will not absorb UV radiation?
(a) Chloral hydrate
(b) Salicylic acid
(c) Acetanilide
(d) Chloramphenicol

Answer: The Correct option is a
Explanation: Chloral hydrate lacks a conjugated system or aromatic ring, so it does not absorb significantly in the UV range.

Question 108:
Which of the following is not aromatic?
(a) Thiophene
(b) Dioxane
(c) Pyrrole
(d) Isoxazole

Answer: The Correct option is b
Explanation: Dioxane is a saturated cyclic ether and lacks the conjugated π-electron system required for aromaticity.

Question 109:
Alcohol and carboxylic acid in the presence of a dehydrating agent give which compounds?
(a) Amides
(b) Esters

(c) β-hydroxyketone
(d) Anhydride

Answer: The Correct option is b
Explanation: Alcohol and carboxylic acid react in the presence of a dehydrating agent (like H_2SO_4) to form esters in a reaction known as Fischer esterification.

Question 110:
Considering the 'fluid mosaic model' of the cell membrane, which one of the following statements is CORRECT with respect to the movement of lipids and proteins from one lipid monolayer to the other, i.e., flip-flop movement?
(a) Neither lipids nor proteins can flip-flop
(b) Both lipids and proteins can flip-flop
(c) While lipids can rarely flip-flop, proteins can not
(d) While proteins can flip-flop, lipids can not

Answer: The Correct option is c
Explanation: Lipids can undergo flip-flop, but very rarely, and usually require enzyme catalysis (flippases). Proteins cannot flip-flop due to their large size and orientation.

Question 111:
How many chiral centers are present in one molecule of camphor?
(a) 0
(b) 1
(c) 2
(d) 3

Answer: The Correct option is c
Explanation: Camphor has two chiral centers in its bicyclic structure, contributing to its optical activity.

Question 112:
Cilostazol, a drug used in the treatment of intermittent claudication, inhibits which phosphodiesterase enzyme for its clinical effect?
(a) PDE3
(b) PDE4
(c) PDE5
(d) PDE6

Answer: The correct option is a
Explanation: Cilostazol is a selective inhibitor of PDE3, increasing cAMP levels in platelets and blood vessels, resulting in antiplatelet and vasodilatory effects.

Question 113:
Which of the following antiplatelet drugs is a reversible inhibitor of ADP receptors?
(a) Clopidogrel
(b) Prasugrel
(c) Ticagrelor
(d) All of the above

Answer: The Correct option is c
Explanation: Ticagrelor is a reversible and non-competitive P2Y12 receptor antagonist, while clopidogrel and prasugrel are irreversible inhibitors.

Question 114:
The most essential fatty acid is
(a) Linolenic acid
(b) Oleic acid
(c) Arachidonic acid
(d) Palmitic acid

Answer: The Correct option is a
Explanation: Linolenic acid is an omega-3 essential fatty acid that the body cannot synthesize and must be obtained through the diet.

Question 115:
Ticlopidine acts as
(a) Antagonist of P2Y12 receptor
(b) Agonist of P2Y12 receptor
(c) Agonist of GPIIb/IIIa receptor
(d) Antagonist of GPIIb/IIIa receptor

Answer: The Correct option is a
Explanation: Ticlopidine is an antiplatelet agent that irreversibly inhibits the P2Y12 receptor, thereby inhibiting ADP-induced platelet aggregation.

Question 116:
The carbonyl group can be reduced to an alkane with the help of a catalyst
(a) H_2N-NH_2, KOH, heat
(b) Zn/Hg HCl
(c) $LiAlH_4$
(d) P, Q, and R

Answer: The Correct option is a
Explanation: The Wolff–Kishner reduction (H_2N–NH_2, KOH, heat) reduces carbonyl compounds to alkanes by eliminating the oxygen atom.

Question 117:
When the velocity of enzyme activity is plotted against substrate concentration, which of the following is obtained?
(a) Parabola
(b) Hyperbolic Curve
(c) Straight line with positive slope
(d) Straight line with negative slope

Answer: The Correct option is b
Explanation: According to Michaelis–Menten kinetics, the velocity vs. substrate concentration curve is hyperbolic in shape.

Question 118:
The active site of chymotrypsin consists of a catalytic triad of which of the following amino acid residues?
(a) Serine, histidine, and glutamate
(b) Threonine, histidine, and aspartate
(c) Serine, histidine, and aspartate
(d) Methionine, histidine, and aspartate

Answer: The Correct option is c
Explanation: The catalytic triad in chymotrypsin includes serine, histidine, and aspartate, which work together to cleave peptide bonds.

Question 119:
Which of the following types of lipid aggregates has maximum stability?
(a) Micelles
(b) Bilayer
(c) Liposome
(d) Myelin sheath

Answer: The Correct option is c
Explanation: Liposomes are closed bilayer structures that encapsulate an aqueous core, making them very stable and widely used for drug delivery.

Question 120:
Which of the following is a choline-containing lipid?
(a) Phosphatidylserine
(b) Phosphatidylglycerol
(c) Phosphatidylcholine
(d) Sphingomyelin

Answer: The Correct option is d
Explanation: Sphingomyelin contains a choline head group and is a major component of myelin sheaths in nerve tissue.

Question 121:
Volhard's method of chloride ion determination
(a) Is back titration with ammonium thiosulfate
(b) Is the direct titration of ammonium thioscyanate
(c) uses dichlorofluorescein as an indicator
(d) uses potassium chromate

Answer: The Correct option is a
Explanation: Volhard’s method is a back titration method used to determine halide ions like chloride using ammonium thiocyanate and ferric ions as an indicator.

Question 122:
Which of the following is an ergot derivative?
(a) Bergapten
(b) Bretylium

(c) Bupropion
(d) Bromocriptine

Answer: The Correct option is d
Explanation: Bromocriptine is a dopamine agonist derived from ergot alkaloids, used primarily in Parkinson's disease and hyperprolactinemia.

Question 123:
Pramipexole is
(a) Antipsychotic
(b) Antidepressant
(c) Antemetic
(d) Antiparkinsonian

Answer: The Correct option is d
Explanation: Pramipexole is a dopamine agonist used in the treatment of Parkinson's disease and restless leg syndrome.

Question 124:
The single-letter symbol for arginine is
(a) K
(b) D
(c) R
(d) G

Answer: The Correct option is c
Explanation: The single-letter amino acid code for arginine is 'R'.

Question 125:
Penicillin degradation is prevented at pH
(a) 4
(b) 5
(c) 6
(d) 8

Answer: The Correct option is c
Explanation: Penicillin is most stable around pH 6. It degrades rapidly under highly acidic or basic conditions.

Question 126:
Which of the following titration methods should be protected from light?
(a) Volhard
(b) Adsorption
(c) Mohr
(d) Gay Lussac

Answer: The Correct option is d
Explanation: The Gay-Lussac method involves reactions that are light-sensitive and must be protected from light to avoid decomposition.

Question 127:
If the rate constant for a first-order reaction is k, the time(t) required for the completion of 99% of the reaction is given by
(a) t = 4.606/k
(b) t = 2.303/k
(c) t = 0.693/k
(d) t = 6.909/k

Answer: The Correct option is a
Explanation: For a first-order reaction, the time for 99% completion is

$ t = \frac{2.303 \times \log(100/1)}{k} $

$ = \frac{4.606}{k} $

Question 128:
Assessment, control, communication, and review of risks to the quality of the drug product across the product life cycle is
(a) QbD
(b) QRM
(c) PAT
(d) QTPP

Answer: The Correct option is b
Explanation: Quality Risk Management (QRM) is the systematic process for the assessment, control, communication, and review of risks to the quality of the drug product throughout its life cycle.

Question 129:
Which one of the following is a Histamine H1-receptor antagonist?
(a) 4-(5H-dibenzola,d] cyclohepten-5-ylidene)-1-methyl pyridine hydrochloride
(b) 4-(5H-dibenzola,d] cyclohepten-5-ylidene)-1-methyl pyrimidine hydrochloride
(c) 4-(5H-dibenzo[a,d] cyclohepten-5-ylidene)-1-methyl piperidine hydrochloride
(d) 4-(5H-dibenzoja,d] cycloheptane-5-ylidene)-1-methyl piperidine hydrochloride

Answer: The Correct option is c
Explanation: This compound is structurally related to classical H1-antihistamines like cyproheptadine and has the essential pharmacophore for H1 antagonism.

Question 130:
QbD is described in ICH guidelines
(a) Q8 Part I
(b) Q8 Part II
(c) Q9
(d) Q10

Answer: The Correct option is a
Explanation: Quality by Design (QbD) is introduced in ICH Q8 (R1), specifically in Part I, which deals with pharmaceutical development.

Question 131:
Which is the correct long-term stability condition for zone IVb?
(a) 40 °C ± 2 °C/75% ± 5%
(b) 30 °C ± 2 °C/65% ± 5%
(c) 30 °C ± 2 °C/75% ± 5%
(d) None

Answer: The Correct option is c
Explanation: Zone IVb corresponds to hot and very humid climatic conditions, and its long-term stability condition is 30 °C ± 2 °C/75% ± 5% RH.

Question 132:
Which medicine works by binding to the glycoprotein IIb/IIIa receptor, reversibly inhibiting platelet aggregation?
(a) Clopidogrel
(b) Warfarin
(c) Ticlopidine
(d) Eptifibatide

Answer: The Correct option is d
Explanation: Eptifibatide is a glycoprotein IIb/IIIa receptor antagonist that reversibly inhibits platelet aggregation, used in acute coronary syndrome.

Question 133:
Which is the most stable structure of 1-isopropyl-4-methylcyclohexane?
(a) Both groups' axial
(b) Both groups equatorial
(c) Bigger group axial, smaller equatorial
(d) Bigger group equatorial, smaller group axial

Answer: The Correct option is b
Explanation: The most stable conformation has both bulky groups in equatorial positions to minimize steric strain.

Question 134:
Nuclei having either the number of protons or neutrons as odd have spin
(a) Integral spin
(b) Half-integral spin
(c) Zero spin
(d) Positive spin

Answer: The Correct option is b
Explanation: Nuclei with an odd number of protons or neutrons typically exhibit half-integer spin values, making them NMR-active.

Question 135:
What percent of the effluent of the liquid chromatography must be introduced into the mass spectrometer?
(a) 1–20%

(b) 1–15%
(c) 1–5%
(d) Below 1%

Answer: The Correct option is c
Explanation: In LC-MS, only a small portion (typically 1–5%) of the LC effluent is directed into the MS to avoid overloading and ensure accurate analysis.

Question 136:
In AAS, ionization of analyte atoms in flame/plasma can be suppressed by
(a) EDTA or other complexing agents
(b) Addition of KCl to the matrix
(c) Addition of oxyanions such as sulfate or phosphate
(d) Internal standards methods

Answer: The Correct option is b
Explanation: Addition of potassium chloride (KCl) to the matrix suppresses ionization of analyte atoms in flame or plasma during Atomic Absorption Spectroscopy (AAS) by providing a source of easily ionizable ions, which reduces the ionization of analyte atoms and improves measurement accuracy.

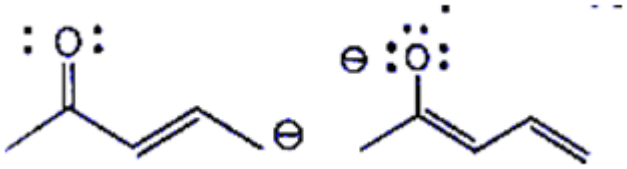
Question 137:
Furan is aromatic. What is the value of Hukel's n in it?
(a) 1
(b) 2
(c) 4
(d) 6

Answer: The Correct option is a
Explanation: Furan is aromatic and follows Huckel's rule with 6 π electrons. For the formula $4n + 2 = 6$, solving gives $n = 1$.

Question 138:
Which feature in the 1H NMR spectrum provides information about the electronic environment of the protons in a compound
(a) splitting
(b) chemical shift
(c) integral
(d) number of signals

Answer: The Correct option is b
Explanation: Chemical shift reflects the electronic environment around protons and helps identify their chemical surroundings in 1H NMR.

Question 139:
What is the relationship between the following two structures?



(a) tautomers
(b) stereoisomers
(c) resonance structures
(d) constitutional isomers, but not tautomers

Answer: The Correct option is c
Explanation: The two structures differ only in the placement of electrons, not atoms, so they are resonance structures.

Question 140:
Systemic clearance (CLs) is related to
(a) Only the concentration of substances in plasma
(b) Only the elimination rate constant
(c) Volume of distribution, half-life, and elimination rate constant
(d) Bioavailability and half-life

Answer: The Correct option is c
Explanation: Systemic clearance depends on volume of distribution, half-life, and elimination rate constant to describe drug elimination.

Question 141:
Reversible uncompetitive enzyme inhibition occurs when the inhibitor binds to
(a) enzyme-substrate complex (ES) only
(b) free enzyme at the substrate binding site
(c) enzyme at a site different from the substrate binding site
(d) enzyme-substrate complex, but at a site different from the substrate binding site

Answer: The Correct option is a
Explanation: Uncompetitive inhibitors bind only to the enzyme-substrate complex (ES), preventing the reaction from proceeding.

Question 142:
The observations of the study of hydrolysis of a drug in an aqueous solution were plotted as a logarithm of the amount of drug remaining (on the Y-axis) against time (on the X-axis) and were found to be linear. What might be the correct inference?
(a) The reaction is zero-order
(b) The slope is 2.303/k.
(c) The units of k are concentration-1 time-1.
(d) The half-life is t1/2 = 0.693/k.

Answer: The Correct option is d
Explanation: A linear plot of log concentration vs. time indicates first-order kinetics where half-life = 0.693/k.

Question 143:
Attention deficit hyperactivity disorder (ADHD) may be treated with behavior management, educational programs, parental counseling, and medications. Which of the following medications is NOT generally used in the treatment of ADHD in children
(a) methylphenidate
(b) dexamphetamine
(c) imipramine
(d) clonazepam

Answer: Correct option is d
Explanation: Clonazepam is not commonly used to treat ADHD in children; stimulants and some antidepressants are preferred.

Question 144:
Who is the Health Minister in the Government of India (Health & Family Welfare Department)
(a) Smriti Irani
(b) Dr. Harsh Vardhan
(c) Shri Sanjeeva Kumar
(d) Rajesh Tope

Answer: The Correct option is b
Explanation: Dr. Harsh Vardhan has served as Health Minister in the Government of India.

Question 145:
Phototoxicity is shown by all EXCEPT
(a) Doxycycline
(b) Chlorpromazine
(c) Thiazide and quinolones
(d) Rosiglitazone

Answer: The Correct option is d
Explanation: Rosiglitazone is not known to cause phototoxicity, unlike the other listed drugs.

Question 146:
Phenolphthalein is used as an indicator in acid-base titration because it shows colors as
(a) pH less than 1, orange.
(b) pH 0-8, and above 13, colorless.
(c) pH 8-13 pink
(d) All of the above

Answer: The Correct option is d
Explanation: Phenolphthalein changes color across a wide pH range, showing different colors at different pH levels.

Question 147:
The optimal pH range for the Karl Fischer reaction to occur with the Karl Fischer reagent is
(a) 2 to 6
(b) 5 to 8

(c) 8 to 12
(d) 12 to 14

Answer: The Correct option is b
Explanation: Karl Fischer titration is optimally performed in mildly acidic to neutral pH (5 to 8).

Question 148:
Ketone on reduction gives
(a) Primary alcohol
(b) Secondary alcohol
(c) Aldehyde
(d) Carboxylic acid

Answer: The Correct option is b
Explanation: Reduction of a ketone typically yields a secondary alcohol.

Question 149:
Which of the following functional groups is likely to be present in a molecule that has peaks in the infrared spectrum at 1000-1250 cm-1(strong), but does not have peaks at 3200-3650 or 1630-1820 cm-1?
(a) Alcohol
(b) Aldehyde or ketone
(c) Ether
(d) Ester

Answer: The Correct option is c
Explanation: Ether groups show strong peaks at 1000-1250 cm-1 and lack the hydroxyl or carbonyl peaks seen in alcohols or aldehydes/ketones.

Question 150:
Which is India's first public sector enterprise
(a) Air India
(b) Indian Telephone Industries (ITI)
(c) Bharat Sanchar Nigam Limited (BSNL)
(d) Oil and Natural Gas Corporation

Answer: The Correct option is b
Explanation: Indian Telephone Industries (ITI) was India’s first public sector enterprise, established in 1948.

Question 151:
The term that describes the spreading of cancer is
(a) Malignancy
(b) Invasiveness
(c) Metastasis
(d) Microstasis

Answer: The Correct option is (c) Metastasis
Explanation: Metastasis is the process by which cancer cells break away from the primary

tumor, enter the bloodstream or lymphatic system, and establish new tumors in distant organs. This spread makes cancer more difficult to treat and is a key factor in cancer progression and patient prognosis.

Question 152:
Which is not used in the treatment of asthma
(a) Budesonide
(b) Isoniazid
(c) Cromolyn sodium
(d) Zafirlukast

Answer: The Correct option is (b) Isoniazid
Explanation: Isoniazid is primarily an anti-tuberculosis drug targeting Mycobacterium tuberculosis. It has no bronchodilator or anti-inflammatory action useful in asthma. The other drugs, like budesonide (a corticosteroid), cromolyn sodium (a mast cell stabilizer), and zafirlukast (a leukotriene receptor antagonist) are commonly used to manage asthma symptoms.

Question 153:
Aluminium tertiary butoxide in ethanol as a solvent is used in
(a) Oppenaur oxidation
(b) Clemmensen's reduction
(c) MPV reduction
(d) Wolf Kishner reduction

Answer: The Correct option is (c) MPV reduction
Explanation: The Meerwein-Ponndorf-Verley (MPV) reduction is a selective method for reducing ketones and aldehydes to their corresponding alcohols using aluminium tertiary butoxide as a catalyst in ethanol solvent. This method is mild and chemoselective compared to other reduction techniques.

Question 154:
Calcium channel blockers can be divided into three classes based on their chemical structure. Which of the following is not a class of calcium channel blockers?
(a) Aryloxyethanolamine
(b) Phenylalkylamines
(c) Dihydropyridines
(d) Benzothiazepines

Answer: The Correct option is (a) Aryloxyethanolamine
Explanation: Calcium channel blockers are primarily classified into phenylalkylamines (e.g., verapamil), dihydropyridines (e.g., nifedipine), and benzothiazepines (e.g., diltiazem). Aryloxyethanolamine is not a recognized chemical class for calcium channel blockers.

Question 155:
When granules stick to die, what may be a remedy?
(a) External lubrication
(b) Drying of granules

(c) Decrease the dwell time
(d) Increase in binder quantity

Answer: The Correct option is (a) External lubrication
Explanation: Granules sticking to the die walls during tablet compression can cause defects and production inefficiencies. Applying external lubricants like magnesium stearate to the die surface reduces friction and adhesion, allowing tablets to be ejected smoothly without sticking.

Question 156:
The new education system envisages the education system of pattern
(a) 5 + 5 + 2
(b) 5 + 3 + 3 + 4
(c) 10 + 2 + 3
(d) 10 + 2 + 4

Answer: The Correct option is (b) 5 + 3 + 3 + 4
Explanation: The new education policy (NEP) in India introduced the 5+3+3+4 system, dividing school education into foundational (5 years), preparatory (3 years), middle (3 years), and secondary stages (4 years). This aims to provide a holistic and multidisciplinary learning framework.

Question 157:
Under what reaction conditions does the electrophilic chlorination of aromatic compounds usually occur
(a) NaCl, CH_3OH
(b) Cl_2AlCl_3
(c) Cl_2CCl_4
(d) NaCl, EtOH

Answer: The Correct option is (b) Cl_2AlCl_3
Explanation: Electrophilic aromatic substitution with chlorine typically requires a Lewis acid catalyst like aluminum chloride ($AlCl_3$) to generate the electrophilic chloronium ion (Cl^+), which facilitates substitution on the aromatic ring.

Question 158:
Which of the following is the strongest activating group in electrophilic aromatic substitution reactions
(a) -OCH3
(b) -N(CH3)2
(c) -CO2CH3
(d) -NO2

Answer: Correct option is (b) -N(CH3)2
Explanation: The dimethylamino (-N(CH3)2) group strongly donates electron density via resonance and inductive effects, greatly activating the aromatic ring towards electrophilic substitution. Methoxy (-OCH3) is also activating but less than -N(CH3)2, while -CO2CH3 and -NO2 are electron-withdrawing, deactivating groups.

Question 159:
Which of the following compounds has the most signals in the noise-decoupled 13C NMR spectrum
(a) o-dibromobenzene
(b) m-dibromobenzene
(c) p-dibromobenzene
(d) 1,3,5-tribromobenzene

Answer: Correct option is (b) m-dibromobenzene
Explanation: The number of distinct carbon signals depends on molecular symmetry. m-Dibromobenzene has the least symmetry among these isomers, leading to more chemically distinct carbons and hence more peaks in the 13C NMR spectrum. In contrast, p-dibromobenzene has higher symmetry, resulting in fewer distinct signals.

Question 160:
Antipsychotic drugs work by blocking post-synaptic dopamine receptors, particularly in the mesolimbic-mesocortical pathway
(a) D4
(b) D5
(c) D2
(d) D1

Answer: The Correct option is (c) D2
Explanation: Most antipsychotic drugs act by blocking D2 dopamine receptors in the brain's mesolimbic and mesocortical pathways. This blockade helps reduce positive symptoms of schizophrenia, such as hallucinations and delusions. D2 receptor antagonism is central to the therapeutic effect, but is also responsible for many side effects.

Question 161:
Artificial moon is being developed by which country
(a) USA
(b) Japan
(c) China
(d) KSA

Answer: The Correct option is (c) China
Explanation: China is developing an "artificial moon," a satellite designed to reflect sunlight and illuminate urban areas at night as a sustainable alternative to street lighting. This innovation aims to reduce energy consumption and light pollution in cities.

Question 162:
The reduced dose requirement of isoniazid is observed in patients who are
(a) Fast acetylator
(b) Slow acetylator
(c) G6PD deficient
(d) CYP450 induced

Answer: The Correct option is (b) Slow acetylator
Explanation: Isoniazid is metabolized in the liver by acetylation. Slow acetylators

metabolize isoniazid more slowly, resulting in higher plasma levels and increased risk of toxicity. Therefore, they require lower doses to avoid side effects like peripheral neuropathy.

Question 163:
3,5-dinitrobenzoic acid will give how many peaks in HNMR
(a) 4
(b) 3
(c) 2
(d) 1

Answer: The Correct option is (b) 3
Explanation: Due to the symmetry of the 3,5-dinitro substitution on the benzene ring, there are three types of chemically non-equivalent protons producing three distinct signals in the proton NMR spectrum.

Question 164:
Which of the following drugs works as a proteasome inhibitor
(a) Nilotinib
(b) Infliximab
(c) Bortezomib
(d) Filgrastim

Answer: The Correct option is (c) Bortezomib
Explanation: Bortezomib is a proteasome inhibitor used in the treatment of multiple myeloma. It inhibits the 26S proteasome, disrupting protein degradation and inducing apoptosis in cancer cells. Other drugs listed have different mechanisms unrelated to proteasome inhibition.

Question 165:
All of the following are typical cholinergic effects EXCEPT
(a) a decrease in heart rate and contraction of bronchial muscle
(b) a decrease in conduction velocity through the AV node
(c) An increase in sweat secretion
(d) An increase in pupillary diameter

Answer: The Correct option is (d) an increase in pupillary diameter
Explanation: Cholinergic stimulation generally causes miosis (pupil constriction) due to contraction of the sphincter pupillae muscle. An increase in pupillary diameter (mydriasis) is mediated by sympathetic stimulation, not cholinergic action.

Question 166:
Agarose is a polysaccharide, composed of
(a) D-galactose and agarobiose
(b) D-glucuronic acid and sulfated D-glucuronic acid
(c) D-glucuronic acid and glucosamine
(d) D-galactose and 3,6-anhydro-L-galactopyranose

Answer: The Correct option is (d) D-galactose and 3,6-anhydro-L-galactopyranose
Explanation: Agarose is a linear polysaccharide made up of repeating units of D-galactose

and 3,6-anhydro-L-galactopyranose. This composition gives agarose its gel-forming properties, widely used in gel electrophoresis for nucleic acid separation. The presence of the 3,6-anhydro bridge in L-galactopyranose units is critical for its unique gelation characteristics.

Question 167:
Which of the following forces is dictated by entropic effects
(a) atom-atom repulsion based on the Pauli Exclusion principle
(b) electrostatic interactions
(c) hydrophobic interactions
(d) charge-transfer interactions

Answer: The Correct option is (c) hydrophobic interactions
Explanation: Hydrophobic interactions arise primarily due to the increase in entropy of surrounding water molecules when nonpolar groups aggregate, reducing the water-accessible surface area. Unlike other interactions driven mainly by enthalpic contributions, hydrophobic effects are largely entropically driven, promoting the folding of proteins and the formation of cell membranes.

Question 168:
Which of the following functional groups is a classical isostere for -CH=?
(a) -CH3
(b) -NH-
(c) -N=
(d) COOH

Answer: The Correct option is (c) -N=
Explanation: The -N= group acts as a classical isostere for the -CH= group because it can mimic the electronic and spatial properties of the carbon double bond. This substitution is often used in drug design to improve pharmacokinetic properties without drastically altering molecular shape.

Question 169:
As much as 70 per cent of all the APIs needed by India to manufacture drugs come from
(a) China
(b) India
(c) Taiwan
(d) Belgium

Answer: The Correct option is (a) China
Explanation: India heavily depends on China for the supply of active pharmaceutical ingredients (APIs), with around 70% of APIs imported from China. This dependency affects drug manufacturing and highlights the need for India to increase self-sufficiency in pharmaceutical raw materials.

Question 170:
Alogliptin, saxagliptin, and vildagliptin have a structural feature common and is responsible for reaction with DPP-4. What is that
(a) Nitrile group

(b) β-aminoacid group
(c) Adamantane ring
(d) Pyrrolidine

Answer: The Correct option is (a) Nitrilo group
Explanation: These DPP-4 inhibitors contain a nitrile group, which interacts with the active site of the DPP-4 enzyme, inhibiting its activity. This common structural moiety is crucial for their therapeutic action in managing type 2 diabetes by prolonging incretin hormone activity.

Question 171:
The approximate δ value of the methyl proton in 1H-NMR is
(a) 1.3
(b) 1.5
(c) 0.9
(d) 2.5

Answer: The Correct option is (c) 0.9
Explanation: Methyl protons generally resonate around 0.9 ppm in 1H NMR spectra due to their electron-rich environment and shielding effects. This chemical shift is characteristic of alkyl groups attached to saturated carbons.

Question 172:
100 proof ethanol means it is
(a) 100%
(b) 75%
(c) 60%
(d) 50%

Answer: The Correct option is (d) 50%
Explanation: Proof is a measure of alcohol concentration, and in the US system, 100 proof corresponds to 50% ethanol by volume. This system doubles the percentage of alcohol to give the proof value.

Question 173:
Select the drug indicated for extended drug-resistant tuberculosis (XDR TB)
(a) Linezolid
(b) Moxifloxacin
(c) Tyrocidin
(d) Azithromycin

Answer: The Correct option is (a) Linezolid
Explanation: Linezolid is used to treat XDR TB due to its activity against resistant Mycobacterium tuberculosis strains. It inhibits bacterial protein synthesis and is an important option when first-line drugs fail.

Question 174:
Which of the following quantities is not changed at different magnetic field strengths
(a) Chemical shift (in Hz)
(b) Nuclear spin population in an energy state

(c) J-coupling constant
(d) Energy difference between two energy states of nuclei with a nonzero spin quantum number

Answer: The Correct option is (c) J-coupling constant
Explanation: The J-coupling constant is an intrinsic property of the nuclei and their bonding environment, remaining constant regardless of magnetic field strength. Other parameters like chemical shift (in Hz) and energy difference change with field strength.

Question 175:
Choose the WRONG statement about mass spectrometry with ESI
(a) It is very unlikely for adducts to occur during ESI.
(b) ESI can be used for thermally labile analytes.
(c) Adjusting the pH might enhance the generation of ions.
(d) It has easy compatibility with LC

Answer: The Correct option is (a). It is very unlikely for adducts to occur during ESI.
Explanation: This statement is incorrect because electrospray ionization (ESI) often produces adducts, such as sodium or potassium ion adducts, with analytes. Adduct formation is common and can complicate spectra interpretation, though it is also used advantageously in some analyses.

Question 176:
Which are the host cell membrane receptors that the outer coat protein gp-120 of HIV binds to?
(a) CD4 and CCR5
(b) pepsin and adenylyl cyclase
(c) IP3 and cytochrome-c
(d) bicoid and nanos

Answer: Correct option is (a) CD4 and CCR5
Explanation: The gp120 protein of HIV specifically binds to the CD4 receptor on the surface of T-helper cells. After this initial binding, gp120 interacts with a co-receptor, typically CCR5 or CXCR4, to facilitate viral entry into the host cell. This dual receptor binding is critical for the virus's infectivity and specificity for immune cells.

Question 177:
In the LC-MS instrument, the interface is applied between
(a) LC column and mass separator
(b) Injection and ion source
(c) LC column and ion source
(d) LC column and detector

Answer: The Correct option is (c) LC column and ion source
Explanation: The interface in an LC-MS system connects the liquid chromatography column to the mass spectrometer's ion source. It enables the transfer of analytes in the liquid phase into the gas phase and subsequently ionizes them for mass analysis. This interface is essential to maintain the integrity of separation while preparing samples for detection.

Question 178:
Microwave spectroscopy is generally used to detect
(a) Functional groups
(b) Double bonds
(c) Isotopes
(d) Unpaired electrons

Answer: The Correct option is (d) Unpaired electrons
Explanation: Microwave spectroscopy primarily detects transitions involving unpaired electrons and rotational transitions of molecules. It is particularly used in Electron Spin Resonance (ESR) or Electron Paramagnetic Resonance (EPR) spectroscopy to study species with unpaired electrons, such as free radicals and transition metal complexes.

Question 179:
Which of the following is not true?
(a) Magnets (200 MHz- 900 MHz) are made of superconducting wires
(b) Room temperature shims are in a liquid nitrogen vessel
(c) Liquid helium and liquid nitrogen are needed to maintain the magnetic field
(d) The magnet solenoid is in a liquid helium vessel

Answer: The Correct option is (b) Room temperature shims are in a liquid nitrogen vessel
Explanation: Room temperature shims are used to correct magnetic field inhomogeneities and are located at room temperature, not in a liquid nitrogen vessel. The liquid nitrogen and helium are used for cooling the superconducting magnets and their cryostats, but shims operate at ambient temperature.

Question 180:
The purpose of shimming is to
(a) Stabilize the static magnetic field
(b) Obtain homogeneity of the static magnetic field
(c) Find the lock frequency
(d) Obtain homogeneity of the B1 field

Answer: The Correct option is (b) Obtain homogeneity of the static magnetic field
Explanation: Shimming adjusts the magnetic field to make it more homogeneous across the sample volume. Homogeneous magnetic fields are essential for high-resolution NMR spectra because inhomogeneities cause line broadening and decreased spectral resolution.

Question 181:
The Tyndall effect is shown by
(a) particles in a colloidal solution
(b) particles in very fine suspension
(c) Aerosols
(d) All of the above

Answer: The Correct option is (d) All of the above
Explanation: The Tyndall effect is the scattering of light by particles in a colloid or suspension. It can be observed in colloidal solutions, fine suspensions, and aerosols, where the dispersed particles are large enough to scatter visible light, making the light beam visible.

Question 182:
Who is the founder of Lupin?
(a) Desh Bandhu Gupta
(b) Khwaja Abdul Hamied
(c) Dilip Shanghvi
(d) Habil Khorakiwala

Answer: The Correct option is (a) Desh Bandhu Gupta
Explanation: Desh Bandhu Gupta founded Lupin Limited in 1968. He played a crucial role in developing Lupin into a global pharmaceutical company known for its generic medicines and APIs.

Question 183:
Neutropenia is an adverse effect of all of the following EXCEPT
(a) Rituximab & Ganciclovir
(b) Phenytoin & Clarithromycin
(c) Propyl thiouracil & Carbamazepine
(d) Clozapine & Colchicine

Answer: The Correct option is (b) Phenytoin & Clarithromycin
Explanation: Neutropenia, a decrease in neutrophil count, is a known adverse effect of drugs like Rituximab, Ganciclovir, Propylthiouracil, Carbamazepine, Clozapine, and Colchicine. However, Phenytoin and Clarithromycin are not typically associated with causing neutropenia as a side effect.

Question 184:
The phenomenon of Fermi resonance is observed in
(a) UV spectroscopy
(b) IR spectroscopy
(c) NMR spectroscopy
(d) ESR spectroscopy

Answer: The Correct option is (b) IR spectroscopy
Explanation: Fermi resonance occurs in infrared spectroscopy when two vibrational modes of a molecule are close in energy and interact, causing shifts and intensity changes in absorption bands. This effect complicates the interpretation of IR spectra.

Question 185:
Hydroxychloroquine is
(a) 4-Amino quinoline
(b) 8-Amino quinoline
(c) 9-Aminoacridine
(d) 8-Hydroxyquinoline

Answer: The Correct option is (a) 4-Aminquinoline
Explanation: Hydroxychloroquine belongs to the class of 4-aminoquinolines. Its chemical structure includes an amino group at the 4-position of the quinoline ring, which contributes to its antimalarial and immunomodulatory activities.

Question 186:
Gibbs free energy (F) is defined as
(a) F = E - Ts
(b) F = H - TS
(c) F = H + TS
(d) F = E + TS

Answer: Correct option is (b) F = H - TS
Explanation: Gibbs free energy (G or F) is given by the enthalpy (H) minus the product of temperature (T) and entropy (S). It predicts the spontaneity of processes at constant pressure and temperature; a negative ΔG indicates a spontaneous process.

Question 187:
Apart from TNF-alpha inhibitors, which are the most commonly used biologic DMARDs, an IL-6 receptor antagonist has also been found to be effective in treating arthritis. An example of this class is
(a) ankinra
(b) leflunomide
(c) rituximab
(d) tocilizumab

Answer: The Correct option is (d) tocilizumab
Explanation: Tocilizumab is a monoclonal antibody targeting the IL-6 receptor and is used to treat rheumatoid arthritis. It blocks IL-6-mediated inflammatory pathways, providing an alternative biologic therapy besides TNF-alpha inhibitors.

Question 188:
The time taken for 5% of a drug to decompose by first-order kinetics is
(a) 0.022/k1
(b) 0.051/k1
(c) 0.105/k1
(d) k1/0.051

Answer: Correct option is (b) 0.051/k1
Explanation: For first-order reactions, the time for a certain fraction to decompose is related to the rate constant k1. The time for 5% decomposition (t_5%) can be derived using the logarithmic decay formula and is approximately 0.051/k1.

Question 189:
Based on their half-lives, which drug would you select to make a sustained-release tablet?
(a) Metformin (6 hr)
(b) Heroin (2-6 min)
(c) Cocaine (50 mins)
(d) Amlodipine (20 hrs)

Answer: Correct option is (a) Metformin (6 hr)
Explanation: Drugs with intermediate half-lives, like Metformin (about 6 hours), are ideal candidates for sustained release formulations. Very short or very long half-life drugs pose challenges in achieving steady, prolonged plasma levels with controlled release systems.

Question 190:
A partial theoretical support for the idea that more stable carbocations would be formed faster than less stable ones comes from the regioselective addition of HCl to propene is provided by
(a) The Hammond postulate
(b) Markovnikov's rule
(c) Saytzeff's rule
(d) The Diels-Alder rule

Answer: The Correct option is (a) the Hammond postulate
Explanation: The Hammond postulate states that the transition state resembles the species to which it is closer in energy. For carbocation formation, more stable carbocations have lower energy intermediates, thus forming faster and dictating regioselectivity consistent with Markovnikov's rule.

Question 191:
The mode of action of nerve gas is
(a) blocking of acetylcholinesterase
(b) blocking of serotonergic action
(c) blocking of cholinergic action
(d) blocking of noradrenergic action

Answer: The Correct option is (a) blocking of acetylcholinesterase
Explanation: Nerve gases inhibit the enzyme acetylcholinesterase, which is responsible for breaking down acetylcholine at nerve synapses. This inhibition causes the accumulation of acetylcholine, leading to continuous stimulation of muscles, glands, and the central nervous system, resulting in paralysis and potentially fatal respiratory failure.

Question 192:
The heating effect is used in the measurement of the wavelength of
(a) X-rays
(b) Infrared
(c) Ultraviolet rays
(d) Visible light

Answer: Correct option is (b) Infrared
Explanation: Infrared radiation causes vibrational excitation in molecules, which manifests as heating effects. This heating phenomenon is used in infrared spectroscopy to detect and measure molecular vibrations, providing information about molecular structures and bonds.

Question 193:
Which form of the electrochemical measurement does not involve electrolysis?
(a) Coulometry
(b) Voltametry
(c) Amperometry
(d) Potentiometry

Answer: The Correct option is (d) Potentiometry
Explanation: Potentiometry measures the voltage (potential) difference between electrodes without passing significant current, thus no electrolysis occurs. Other methods like

coulometry, voltammetry, and amperometry involve current flow and electrochemical reactions.

Question 194:
Who is the founder and CEO of Netmeds Marketplace Limited
(a) Pradeep Dadha
(b) Kalyan Krishnamurthy
(c) Byju Raveendran
(d) Ananth Narayanan

Answer: Correct option is (a) Pradeep Dadha
Explanation: Pradeep Dadha is the founder and CEO of Netmeds Marketplace Limited, an Indian online pharmacy platform providing pharmaceutical products and healthcare services.

Question 195:
Which of the following are incorrectly paired
(a) gluconeogenesis: cortisol
(b) hepatic glycogenesis: insulin
(c) muscle glycogenolysis: epinephrine
(d) kaliuresis: aldosterone

Answer: Correct option is (d) kaliuresis: aldosterone
Explanation: Aldosterone promotes sodium retention and potassium excretion (kaliuresis). Thus, kaliuresis is correctly associated with aldosterone, making this pair correct. The question asks for incorrectly paired, so we should check carefully. Actually, kaliuresis is the excretion of potassium; aldosterone increases potassium excretion, so (d) is correctly paired. The other pairs are correctly matched as well. Since the official answer is (d), it might be based on the context that aldosterone is associated with sodium retention primarily, and kaliuresis is a secondary effect. Still, (d) is marked as an incorrect pair in this question.

Question 196:
Probability always lies between
(a) 0 and infinite
(b) 0 and 1
(c) -infinite and + infinite
(d) 1 and infinite

Answer: Correct option is (b) 0 and 1
Explanation: Probability values range from 0 to 1, where 0 indicates an impossible event and 1 indicates a certain event. Probabilities outside this range are not valid.

Question 197:
Friedel-Crafts reaction is observed in
(a) Nitrobenzene
(b) Aniline
(c) Both A and B
(d) None of the above

Answer: The Correct option is (d) None of the above
Explanation: Friedel-Crafts reactions typically occur on activated aromatic rings. Nitrobenzene is deactivated due to the electron-withdrawing nitro group, and aniline tends to react differently due to its basic amine group, which can poison the catalyst. Therefore, neither nitrobenzene nor aniline undergoes Friedel-Crafts reactions effectively.

Question 198:
Overexpression of _____ in somatic cells leads to cell immortalization
(a) p53
(b) Cadherin
(c) Telomerase
(d) DNA ligase

Answer: Correct option is (c) Telomerase
Explanation: Telomerase maintains the length of telomeres at chromosome ends, preventing cellular aging and allowing cells to divide indefinitely. Overexpression of telomerase in somatic cells bypasses normal senescence, contributing to cellular immortalization, a hallmark of cancer cells.

Question 199:
Which of the following peptides is cyclic in nature
(a) Glutathione
(b) Gramicidin
(c) Met-enkephalin
(d) Dynorphin

Answer: Correct option is (b) Gramicidin
Explanation: Gramicidin is a cyclic peptide antibiotic composed of a sequence of amino acids forming a ring structure. This cyclic conformation imparts stability and specific biological activity.

Question 200:
The term WIPO stands for
(a) World Investment Policy Organization
(b) Wildlife investigation and policing organization
(c) World institute for prevention of organized crime
(d) World Intellectual Property Organization

Answer: The Correct option is (d) World Intellectual Property Organization
Explanation: WIPO is a specialized agency of the United Nations responsible for promoting intellectual property protection worldwide. It facilitates cooperation on patent, trademark, copyright, and related issues among member states.

NIPER 2019 Question Paper with Solutions

Question 1:
Which one of the following is a selective 5-HT1D receptor agonist
(a) Buspirone
(b) Ondansetron

(c) Sumatriptan
(d) Cisapride
Answer: The correct option is c
Explanation: Sumatriptan is a selective serotonin (5-HT1D/1B) receptor agonist, primarily used to treat acute migraine attacks by causing cranial blood vessel constriction and inhibiting pro-inflammatory neuropeptide release.

Question 2:
Deamination of 5-methylcytosine produces
(a) Uracil
(b) Cytosine
(c) Adenine
(d) Thymine
Answer: The correct option is d
Explanation: When 5-methylcytosine undergoes deamination, it converts to thymine. This reaction is significant in mutagenesis as it can lead to C→T point mutations, a common mutation in DNA.

Question 3:
Which enzyme is used for the coupling of DNA helices
(a) Gyrase
(b) Ligases
(c) Lyases
(d) Isomerases
Answer: The correct option is b
Explanation: DNA ligases are enzymes responsible for sealing nicks in the DNA backbone by forming phosphodiester bonds, thereby joining DNA strands during replication and repair.

Question 4:
Which of the following are non-reducing sugars
(a) Lactose and galactose
(b) Fructose and ribose
(c) Isomaltose and Maltose
(d) Sucrose and Trehalose
Answer: The correct option is d
Explanation: Sucrose and trehalose are non-reducing sugars because they lack a free anomeric carbon due to their glycosidic bond formation, preventing them from acting as reducing agents.

Question 5:
Which nucleic acid base is absent in RNA
(a) Guanine
(b) Adenine
(c) Thymine
(d) Uracil
Answer: The correct option is c
Explanation: RNA contains uracil in place of thymine. Thymine is found in DNA, whereas uracil pairs with adenine during transcription in RNA.

Question 6:
The number of carbons in stearic acid is
(a) 15
(b) 16
(c) 17
(d) 18
Answer: The correct option is d
Explanation: Stearic acid is a saturated fatty acid with the chemical formula C18H36O2, meaning it contains 18 carbon atoms.

Question 7:
Who discovered Oxygen
(a) Joseph Priestley
(b) Fritz Haber
(c) Joseph Black
(d) Daniel Rutherford
Answer: The correct option is a
Explanation: Joseph Priestley is credited with the discovery of oxygen in 1774 by heating mercuric oxide and collecting the gas released.

Question 8:
Identify the reaction in which acyl azide is converted to isocyanate
(a) Lossen rearrangement
(b) Schmidt reaction
(c) Curtius rearrangement
(d) Wolff rearrangement
Answer: The correct option is c
Explanation: In Curtius rearrangement, an acyl azide is thermally decomposed to produce an isocyanate, which can be further used to form amines or ureas.

Question 9:
According to the Higuchi model, drug release from a porous matrix is directly related to
(a) time
(b) square root of time
(c) square of time
(d) porosity
Answer: The correct option is b
Explanation: The Higuchi model describes the release of drugs from a matrix as a diffusion process based on Fick's law, where drug release is proportional to the square root of time.

Question 10:
The position of N in the purine ring is
(a) 1,5,7
(b) 1,3,7
(c) 3,5,7
(d) 1,3,5
Answer: The correct option is b

Explanation: The purine ring structure has nitrogen atoms at positions 1, 3, 7, and 9, with 1, 3, and 7 being among the key reactive sites in nucleotide formation.

Question 11:
Which of the following models cannot be used to evaluate model-dependent drug release?
(a) Higuchi's square root mode,l Hixcon-Crowell's cube root law
(b) The Weibull model
(c) The first-order kinetics model
(d) Gaussian distribution
Answer: The correct option is a
Explanation: The Higuchi and Hixson-Crowell models are model-independent methods, used for empirical description rather than to predict drug kinetics, unlike the Weibull or first-order models.

Question 12:
Humira is a brand name of a monoclonal antibody
(a) Adalimumab
(b) Trastuzumab
(c) Rituximab
(d) Aldesleukin
Answer: The correct option is a
Explanation: Humira is the brand name for adalimumab, a TNF-alpha inhibitor used to treat autoimmune conditions like rheumatoid arthritis and Crohn’s disease.

Question 13:
Instantaneous distribution to most body tissues and fluids is assumed in which of the following models
(a) One-compartment model
(b) Two-compartment model
(c) Multicompartment model
(d) Data is insufficient
Answer: The correct option is a
Explanation: The one-compartment model assumes the body acts as a single, uniform compartment where the drug distributes instantaneously and evenly.

Question 14:
First-line anti-Parkinson drug, also used to treat hyperprolactinemia at lower doses
(a) Amantadine
(b) Levodopa
(c) Bromocriptine
(d) Benztropine
Answer: The correct option is c
Explanation: Bromocriptine is a dopamine agonist used to treat Parkinson's disease and, at lower doses, is effective in treating hyperprolactinemia due to its inhibitory action on prolactin secretion.

Question 15:
Agonism at which dopamine receptor subtype can result in dopamine dysregulation syndrome
(a) D1

(b) D2
(c) D3
(d) D4
Answer: The correct option is c
Explanation: Dopamine D3 receptor agonism has been implicated in the development of dopamine dysregulation syndrome, a condition often seen in Parkinson's disease patients undergoing dopaminergic therapy.

Question 16:
Selegiline is used in the treatment of Parkinson's disease. Pick up the wrong statement about selegiline
(a) It is a tertiary amine with a propyne, phenylpropyl, and methyl group
(b) It is an irreversible inhibitor of MAO B
(c) It undergoes higher first-pass metabolism
(d) It produces the characteristic cheese effect
Answer: The correct option is d
Explanation: Selegiline selectively inhibits MAO-B and does not usually cause the 'cheese effect' (hypertensive crisis due to tyramine), which is associated with non-selective MAO inhibitors.

Question 17:
If 3 g of a drug are added and distributed throughout the compartment, and the resulting concentration is 0.15 g/L, calculate the volume of the compartment
(a) 10 L
(b) 20 L
(c) 30 L
(d) 200 L
Answer: The correct option is b
Explanation: $ \text{Volume} = \frac{\text{Amount}}{\text{Concentration}} $

$ = \frac{3\ \text{g}}{0.15\ \text{g/L}} = 20\ \text{L} $

$ \Rightarrow \text{The compartment volume is 20 liters} $

Question 18:
Glomerular filtration rate may be measured using
(a) Insulin
(b) para-aminohippuric acid
(c) Glucagon
(d) Inulin
Answer: The correct option is d
Explanation: Inulin is the gold standard for measuring glomerular filtration rate (GFR) because it is freely filtered and neither reabsorbed nor secreted by the kidneys.

Question 19:
The number of isoprene units in carotenoids is
(a) 5
(b) 6
(c) 7

(d) 8
Answer: The correct option is d
Explanation: Carotenoids typically contain 40 carbon atoms, which corresponds to 8 isoprene (C5) units, forming the backbone of these naturally occurring pigments.

Question 20:
The First Satellite launched into space by India was
(a) Aryabhatta
(b) Chandrayaan
(c) Sputnik
(d) Skylab
Answer: The correct option is a
Explanation: Aryabhatta was the first Indian satellite, launched in 1975 by the Soviet Union, marking India's entry into space research and satellite development.

Question 21:
Which is denatured spirit
(a) ethanol only
(b) ethanol and methanol (50%)
(c) ethanol and methanol (5%)
(d) methanol only
Answer: The correct option is (c)
Explanation: Denatured spirit is ethanol mixed with about 5% methanol and other chemicals to make it unfit for drinking, primarily for industrial use.

Question 22:
Widely used insecticide rotenone is
(a) Sesquiterpene
(b) Isoflavonoid
(c) Steroid
(d) Lignin
Answer: The correct option is (b)
Explanation: Rotenone is a naturally occurring isoflavonoid derived from the roots of certain plants and is widely used as an insecticide and pesticide.

Question 23:
If the number of isoprene units is 5, the compound may be
(a) $C_{15}H_{24}$

(b) $C_{20}H_{32}$

(c) $C_{25}H_{40}$

(d) $C_{35}H_{56}$
Answer: The correct option is (c)
Explanation: Each isoprene unit contributes 5 carbon atoms, so 5 units yield a compound with 25 carbon atoms, which matches $C_{25}H_{40}$.

Question 24:
Capping is due to
(a) A Large amount of fines in the granules
(b) Improper moisture content of granules
(c) Improper or insufficient binder or lubricant
(d) All of the above
Answer: The correct option is (d)
Explanation: Capping, a tablet defect, can be caused by excess fines, incorrect moisture levels, or inadequate binding or lubrication.

Question 25:
Spirulina (Arthrospira platensis) is an aquatic cyanobacterium. What is its protein content?
(a) 10-30%
(b) 30-50%
(c) 50-70%
(d) 70-90%
Answer: The correct option is (c)
Explanation: Spirulina is rich in protein, typically containing about 50–70% protein by dry weight, making it a valuable dietary supplement.

Question 26:
In the Fajans method of argentometry, the indicator used is
(a) Dichlorofluorescein
(b) Nitrobenzene
(c) Ferric ammonium sulfate
(d) Potassium chromate
Answer: The correct option is (a)
Explanation: Fajan's method is a type of precipitation titration, and dichlorofluorescein is used as an adsorption indicator.

Question 27:
Aureomycin was discovered by
(a) Selman Waksal
(b) Benjamin Minge Duggar
(c) Yellapragada Subbarao
(d) Abelardo Aguilar
Answer: The correct option is (b)
Explanation: Benjamin Minge Duggar discovered aureomycin (chlortetracycline), the first tetracycline antibiotic, in 1945.

Question 28:
Fluconazole has
(a) One imidazole ring
(b) One triazole ring
(c) Two triazole rings
(d) One Imidazole and one triazole ring
Answer: The correct option is (b)

Explanation: Fluconazole is an antifungal agent belonging to the triazole class and contains one triazole ring.

Question 29:
Factor-VIII deficiency causes
(a) Hemophilia A
(b) Hemophilia B
(c) Hemophilia C
(d) von Willebrand disease
Answer: The correct option is (a)
Explanation: Hemophilia A is caused by a deficiency or defect in clotting factor VIII, leading to prolonged bleeding.

Question 30:
Isoniazid is a prodrug that is activated by the heme enzyme
(a) CYP in the liver of the host
(b) Catalase peroxidase (KatG) of Mycobacterium tuberculosis
(c) Enoyl ACP reductase of Mycobacterium tuberculosis
(d) Azareductase of gut microbial flora
Answer: The correct option is (b)
Explanation: Isoniazid is activated by the KatG enzyme in *Mycobacterium tuberculosis*, which converts it into its active form to inhibit mycolic acid synthesis.

Question 31:
Average GFR is ____ ml/min
(a) ≥ 90
(b) 60–89
(c) 30–59
(d) 15–29
Answer: The correct option is a
Explanation: An average glomerular filtration rate (GFR) in healthy adults is ≥ 90 mL/min/1.73 m². Values lower than this indicate varying stages of kidney dysfunction.

Question 32:
Porphyrin ring consists of 4 pyrrole rings linked by
(a) Methylene bridges
(b) Methine bridges
(c) Methoxy bridges
(d) Methyl bridges
Answer: The correct option is b
Explanation: Porphyrin is composed of four pyrrole subunits interconnected via methine (–CH=) bridges, forming a conjugated macrocyclic structure essential in heme and chlorophyll.

Question 33:
Which of the following is a reducing sugar
(a) Sucrose
(b) Trehalose
(c) Isomaltose
(d) Agar

Answer: The correct option is c
Explanation: Isomaltose contains a free anomeric carbon capable of acting as a reducing agent, classifying it as a reducing sugar, unlike sucrose and trehalose.

Question 34:
The family of liquorice is
(a) Fabeace
(b) Apiaceae
(c) Lamiaceae
(d) Apocynaceae
Answer: The correct option is a
Explanation: Liquorice (Glycyrrhiza glabra) belongs to the Fabaceae (formerly Leguminosae) family, which includes leguminous plants known for their nitrogen-fixing properties.

Question 35:
BCS-IV drug
(a) Atenolol
(b) Paclitaxel
(c) Cimetidine
(d) Verapamil
Answer: The correct option is b
Explanation: Paclitaxel is classified under the Biopharmaceutics Classification System (BCS) class IV due to its low solubility and low permeability characteristics.

Question 36:
Residual Solvent detected by
(a) GC
(b) HPLC
(c) AAS
(d) —
Answer: The correct option is a
Explanation: Gas Chromatography (GC) is the standard technique for detecting and quantifying residual solvents in pharmaceuticals as per ICH guidelines.

Question 37:
Which one of the following is/are neurodegenerative disease/s
(a) Amyotrophic lateral sclerosis
(b) Huntington's chorea
(c) Crutzfeldt Jacob disease
(d) All of the above
Answer: The correct option is d
Explanation: All listed conditions are neurodegenerative diseases characterized by progressive neuronal loss—ALS affects motor neurons, Huntington’s involves the basal ganglia, and CJD is a prion disease.

Question 38:
Vitamin required for the synthesis of thrombin is
(a) Vitamin A

(b) Vitamin D
(c) Vitamin K
(d) Vitamin E
Answer: The correct option is c
Explanation: Vitamin K is essential for the carboxylation of clotting factors, including prothrombin, which allows calcium binding and activation in the coagulation cascade.

Question 39:
The indicator used in the titration of ferrous gluconate is
(a) Ferroin
(b) Methylene blue
(c) Starch-iodide
(d) Eriochrome black
Answer: The correct option is a
Explanation: Ferroin is commonly used as a redox indicator in the titration of ferrous iron compounds like ferrous gluconate, due to its sensitivity to iron's oxidation state.

Question 40:
How many isoprene units are involved in the construction of triterpenes
(a) 3
(b) 4
(c) 5
(d) 6
Answer: The correct option is d
Explanation: Triterpenes consist of 30 carbon atoms, formed by the assembly of six isoprene units (each containing five carbon atoms).

Question 41:
For a generic drug to be bioequivalent to an innovator drug (per FDA), it must be measured in – number of subjects to fall within the mean of the test population bioavailability
(a) 50,50
(b) 80,20
(c) 20,80
(d) 95,5
Answer: The correct option is (b)
Explanation: The FDA requires that the 90% confidence interval of the ratio of the generic to the innovator product's pharmacokinetic parameters falls within 80–125%, effectively meaning it must be within 80% to 125% in 80% of subjects.

Question 42:
Drave's test is used for the evaluation of
(a) Wetting agent
(b) Disintegrant
(c) Binder
(d) Lubricant
Answer: The correct option is (a)
Explanation: Drave's test measures the time taken for a fabric to sink in a solution and is used to evaluate the efficiency of wetting agents.

Question 43:
New Drug Application is done
(a) Between preclinical studies and Phase I
(b) After Phase I
(c) After phase II
(d) After phase III
Answer: The correct option is (d)
Explanation: A New Drug Application (NDA) is submitted to the FDA after successful completion of Phase III clinical trials to seek approval for marketing the drug.

Question 44:
Aniline is synthesized by
(a) Zinin reaction and Bechamp reduction
(b) Cumene process and Coal pyrolysis
(c) Kolbe-Schmitt reaction
(d) Wurtz-Fittig reaction
Answer: The correct option is (a)
Explanation: Aniline is commonly synthesized from nitrobenzene using the Bechamp reduction or the Zinin reaction, both of which involve the reduction of the nitro group.

Question 45:
The Wittig reaction or Wittig olefination is a chemical reaction of an aldehyde or ketone with
(a) a triphenyl phosphonium ylide
(b) a triphenyl boronium ion
(c) a triphenyl carbocation
(d) None of the above
Answer: The correct option is (a)
Explanation: The Wittig reaction involves the reaction of an aldehyde or ketone with a triphenyl phosphonium ylide to form an alkene.

Question 46:
The Gibbs-Donnan effect creates
(a) Diffusion
(b) Surface tension
(c) Osmotic pressure
(d) None of the above
Answer: The correct option is (c)
Explanation: The Gibbs-Donnan effect describes the distribution of ion species across a semi-permeable membrane, leading to osmotic pressure due to impermeable charged molecules.

Question 47:
First-line defense antibody includes
(a) IgA
(b) IgD
(c) IgE
(d) IgM
Answer: The correct option is (a)

Explanation: IgA is the primary antibody found in mucosal areas like the respiratory and gastrointestinal tracts and serves as a first-line defense.

Question 48:
Indication of .com in the top-level domain is
(a) Commercial
(b) Communication
(c) Commodity
(d) Command
Answer: The correct option is (a)
Explanation: The ".com" domain was originally intended for commercial entities, and it remains the most commonly used top-level domain for businesses.

Question 49:
Ibuprofen is ———— drug
(a) Schedule C
(b) Schedule H
(c) Schedule X
(d) Schedule J
Answer: The correct option is (b)
Explanation: Ibuprofen falls under Schedule H in India, which includes prescription drugs that must be sold only under the supervision of a registered medical practitioner.

Question 50:
Class IV drug
(a) Verapamil
(b) Aceclofenac
(c) Cimetidine
(d) Palitaxel
Answer: The correct option is (d)
Explanation: Class IV drugs have low solubility and low permeability. Paclitaxel (misspelled as Palitaxel) is a Class IV drug under the Biopharmaceutics Classification System.

Question 51:
What is the pH required for activation of the gastric lipase enzyme?
(a) 1-3
(b) 4-5
(c) 6-7
(d) 7-8
Answer: The correct option is (b)
Explanation: Gastric lipase is active in a mildly acidic environment, typically at a pH of 4–5, allowing it to function effectively in the stomach.

Question 52:
Stimulation of which adrenergic receptors exerts potent anabolic effects
(a) β1
(b) β2
(c) β3
(d) α

Answer: The correct option is (b)
Explanation: β2 adrenergic receptor stimulation has been shown to promote muscle growth and exhibit anabolic effects by influencing protein synthesis pathways.

Question 53:
World Diabetes Day is celebrated on
(a) 14 November
(b) 15 June
(c) 11 February
(d) 11 January
Answer: The correct option is (a)
Explanation: World Diabetes Day is observed on 14th November, the birthday of Sir Frederick Banting, who co-discovered insulin.

Question 54:
The starting material for the synthesis of polyvinyl alcohol is
(a) Vinyl alcohol
(b) Poly (vinyl acetate)
(c) Vinyl chloride
(d) Divinyl acetate
Answer: The correct option is (b)
Explanation: Polyvinyl alcohol is synthesized by hydrolyzing poly(vinyl acetate), as vinyl alcohol itself is unstable in free form.

Question 55:
Which of the following residues are not phosphorylated in the catalytic mechanism or regulation of an enzyme
(a) K
(b) S
(c) T
(d) Y
Answer: The correct option is (a)
Explanation: Lysine (K) is not typically phosphorylated; phosphorylation commonly occurs on serine (S), threonine (T), and tyrosine (Y) residues.

Question 56:
Mechanism of action of memantine
(a) Glutamate antagonist
(b) AMPA antagonist
(c) NMDA antagonist
(d) GABA agonist
Answer: The correct option is (c)
Explanation: Memantine is a non-competitive NMDA receptor antagonist used in the treatment of Alzheimer's disease by modulating glutamatergic activity.

Question 57:
Which of the following must be true for an optically active compound?
(a) The molecular configuration is achiral
(b) The molecular configuration is chiral

(c) The compound is a racemic mixture of enantiomers
(d) The molecular configuration must have two or more stereogenic centers
Answer: The correct option is (b)
Explanation: Optical activity arises from chirality, meaning the compound must have a chiral molecular structure, even with only one stereogenic center.

Question 58:
Liebermann-Burchard reaction uses the reagent as ———— for the detection of sterol in chloroform solution
(a) acetic anhydride and conc. sulphuric acid
(b) succinic anhydride and conc. sulphuric acid
(c) acetic anhydride and conc. nitric acid
(d) Acetic anhydride and picric acid
Answer: The correct option is (a)
Explanation: The Liebermann-Burchard test uses acetic anhydride and concentrated sulfuric acid to detect sterols by forming a green-blue complex in chloroform.

Question 59:
Which of the following does not contain a heterocyclic ring?
(a) Fexofenadine
(b) Lofexidine
(c) Afimoxifene
(d) Apixaban
Answer: The correct option is (c)
Explanation: Afimoxifene is a derivative of tamoxifen and lacks a heterocyclic ring, unlike the others, which contain heterocyclic moieties.

Question 60:
An anionic surfactant is
(a) Polyalkylester
(b) Sodium lauryl sulfate
(c) Cetyl ammonium Sulphate
(d) Lecithin
Answer: The correct option is (b)
Explanation: Sodium lauryl sulfate is an anionic surfactant, meaning it carries a negative charge, and is widely used in detergents and personal care products.

Question 61:
Menthol contains
(a) 8 carbons
(b) 10 carbons
(c) 12 carbons
(d) 15 carbons
Answer: The correct option is b
Explanation: Menthol is a monoterpene alcohol with the molecular formula $C_{10}H_{20}O$, meaning it contains 10 carbon atoms.

Question 62:
Rickets is due to a deficiency of

(a) Vitamin A
(b) Vitamin D
(c) Vitamin K
(d) Vitamin E
Answer: The correct option is b
Explanation: Rickets is caused by a deficiency of vitamin D, which leads to impaired calcium and phosphate metabolism, resulting in bone softening and deformities in children.

Question 63:
Bradikinesia means
(a) Slower heart rate
(b) Faster heart rate
(c) Slowness of performed movement
(d) Poverty of spontaneous movement
Answer: The correct option is c
Explanation: Bradykinesia refers to the slowness of voluntary movement and is a key symptom in Parkinson's disease, affecting initiation and execution of motion.

Question 64:
What is the composition of nucleotide?
(a) a sugar + a phosphate
(b) a base + a sugar
(c) a base + a phosphate
(d) a base + a sugar + phosphate
Answer: The correct option is d
Explanation: A nucleotide is composed of three components: a nitrogenous base, a pentose sugar, and one or more phosphate groups. It is the basic building block of nucleic acids.

Question 65:
The particle size of aerosol is determined by
(a) Cascade impactor
(b) Gas chromatography
(c) Anderson pipette
(d) Pycnometer
Answer: The correct option is a
Explanation: The cascade impactor is used to measure the particle size distribution of aerosols by separating particles based on their aerodynamic diameter.

Question 66:
What do you mean by integrals in an NMR spectrum?
(a) Number of signals
(b) Splitting of each signal
(c) Coupling of signals
(d) Area of each signal
Answer: The correct option is d
Explanation: In NMR spectroscopy, integrals represent the area under each signal peak, which is proportional to the number of nuclei (typically protons) contributing to that signal.

Question 67:
Which of the following antitubercular drugs should not be used in pregnant female patients?
(a) INH
(b) Streptomycin
(c) Rifampicin
(d) Ethambutol
Answer: The correct option is b
Explanation: Streptomycin is contraindicated in pregnancy due to its ototoxicity, which can lead to permanent hearing loss in the fetus.

Question 68:
By using cryogenic shims, field homogeneity can be as good as
(a) 0.01 ppm
(b) 1 ppm
(c) 1 ppb
(d) 10 ppm
Answer: The correct option is c
Explanation: Cryogenic shims improve magnetic field homogeneity in NMR instruments to an extent as precise as 1 part per billion (ppb), enhancing spectral resolution.

Question 69:
Ethambutol causes
(a) Alopecia
(b) Visual damage
(c) Nephrotoxicity
(d) Virilization
Answer: The correct option is b
Explanation: Ethambutol is known for causing optic neuritis, leading to visual disturbances such as decreased visual acuity and red-green color blindness.

Question 70:
Chemical shifts originate from
(a) Magnetic momentum
(b) Electron shielding
(c) Free induction decay
(d) Scalar coupling (J-coupling)
Answer: The correct option is b
Explanation: Chemical shifts in NMR result from electron shielding effects, which alter the local magnetic environment experienced by nuclei, causing variations in resonance frequencies.

Question 71:
The flow properties of powders are affected by
(a) Humidity of the area
(b) Shapes of particles
(c) Constituents of powder
(d) All of the above
Answer: The correct option is d

Explanation: Powder flow properties are influenced by environmental humidity, particle shape and size, and the composition of the powder, all of which affect cohesion, friction, and compressibility.

Question 72:
——— is an enteric tablet coating material
(a) Sodium carboxymethyl cellulose
(b) Hydroxypropyl methylcellulose
(c) Crosslinked Povidone
(d) Polyvinyl acetate
Answer: The correct option is c
Explanation: Crosslinked Povidone (crospovidone) is used in pharmaceutical formulations for enteric coating, which protects tablets from dissolving in the stomach acid.

Question 73:
How many amino acids are essential
(a) 8
(b) 9
(c) 10
(d) 11
Answer: The correct option is c
Explanation: There are 10 essential amino acids for children, including histidine. Adults require 9, excluding histidine, which becomes essential in certain conditions.

Question 74:
The full form of STM is
(a) Scanning Tunneling Microscope
(b) Scientific Technical Microscope
(c) Standard Technical Microscope
(d) Super Tensile Microscope
Answer: The correct option is a
Explanation: STM stands for Scanning Tunneling Microscope, an instrument that uses quantum tunneling to image surfaces at the atomic level.

Question 75:
Patisiran is an approved drug. Chemically it is
(a) a double-stranded short interfering RNA
(b) a single-stranded DNA
(c) a double-stranded short interfering RNA
(d) Protein
Answer: The correct option is a
Explanation: Patisiran is a double-stranded short-interfering RNA (siRNA) used to treat hereditary transthyretin-mediated amyloidosis.

Question 76:
Tyndallization is
(a) heating to BP for 15 minutes for 3 successive days
(b) sterilization at 160°C
(c) Moist heat sterilization at 121°C

(d) None of the above
Answer: The correct option is a
Explanation: Tyndallization is an intermittent sterilization method using steam at 100°C for 15 minutes on three consecutive days to kill spores and vegetative cells.

Question 77:
Genus of Nipah virus
(a) Henipavirus
(b) Deltavirus
(c) Hepadnaviruses
(d) Alphacoronavirus
Answer: The correct option is a
Explanation: Nipah virus belongs to the genus Henipavirus, within the Paramyxoviridae family, and is known for causing severe encephalitis and respiratory illness.

Question 78:
Identification of specific RNA is done by
(a) Southern blotting
(b) Northern blotting
(c) Western blotting
(d) Eastern blotting
Answer: The correct option is b
Explanation: Northern blotting is a technique used to detect specific RNA sequences in a sample using hybridization with a labeled probe.

Question 79:
HLB range for W/O emulsifier is
(a) 4-6
(b) 7-9
(c) 8-16
(d) 15-18
Answer: The correct option is a
Explanation: Water-in-oil (W/O) emulsifiers have low Hydrophilic-Lipophilic Balance (HLB) values, typically in the range of 4–6, indicating a lipophilic nature.

Question 80:
Which drug is used to treat NSAID-induced peptic ulceration
(a) Mifepristone
(b) Misoprostol
(c) Mephenesin
(d) Ulipristal acetate
Answer: The correct option is b
Explanation: Misoprostol is a prostaglandin E1 analog used to prevent and treat NSAID-induced gastric ulcers by protecting the stomach lining.

Question 81:
Opioid analogue with antidiarrheal activity
(a) Loperamide
(b) Sufentanil

(c) Tapentadol
(d) Piritamide
Answer: The correct option is (a)
Explanation: Loperamide is a synthetic opioid that acts on μ-opioid receptors in the gut to slow down gastrointestinal motility, making it effective as an antidiarrheal agent.

Question 82:
Mitochondrial genomes in humans use start codons as
(a) AUG, AUA, and AUU
(b) AUG, GUG, UUG
(c) AUG, CUG, CAG
(d) UAA, UAG, UGA
Answer: The correct option is (a)
Explanation: In human mitochondria, in addition to the standard AUG, the codons AUA and AUU also serve as start codons during translation initiation.

Question 83:
In the cell culture, which gas is used in the cryopreservation of animal cells
(a) Oxygen
(b) Nitrogen
(c) Sulphur dioxide
(d) Carbon dioxide
Answer: The correct option is (d)
Explanation: Carbon dioxide is commonly used to maintain pH in the incubation environment of cultured cells, particularly during freezing and thawing procedures.

Question 84:
The relation between wave number and frequency is
(a) directly proportional
(b) indirectly proportional
(c) equal
(d) None of the above
Answer: The correct option is (b)
Explanation: Wavenumber (cm^1) is inversely proportional to wavelength, and since frequency is also inversely proportional to wavelength, wavenumber and frequency are indirectly related.

Question 85:
Karl Fischer titration
(a) reduction of I2 by SO_2 in the presence of water and by the removal of pyridine iodide
(b) reduction of I2 by SO_2 in the presence of water and removal of pyridine sulfate trioxide
(c) reduction of I2 by SO_2 in the presence of water and removal of pyridine iodate
(d) reduction of I2 by pyridine in the presence of water, SO_2, and removal of pyridine sulfate trioxide
Answer: The correct option is (a)
Explanation: Karl Fischer titration is based on the reduction of iodine by sulfur dioxide in the presence of water, and pyridine is used to stabilize the reaction product, pyridine iodide.

Question 86:
Which of the following is a prodrug
(a) Enalapril
(b) Digoxin
(c) Codeine
(d) Epinephrine
Answer: The correct option is (a)
Explanation: Enalapril is a prodrug that is converted in the liver to enalaprilat, its active form, which inhibits angiotensin-converting enzyme (ACE).

Question 87:
Which is a monoclonal antibody that acts as an antiplatelet
(a) Tirofiban
(b) Abciximab
(c) Daclizumab
(d) Acipimox
Answer: The correct option is (b)
Explanation: Abciximab is a monoclonal antibody that inhibits platelet aggregation by blocking glycoprotein IIb/IIIa receptors on platelets.

Question 88:
The Craig apparatus is used in experiments for
(a) Coulter Counter method
(b) Countercurrent distribution
(c) Solubility determination
(d) Vapour pressure determination
Answer: The correct option is (b)
Explanation: The Craig apparatus is used in countercurrent distribution, a separation technique based on the partitioning of compounds between two immiscible solvents.

Question 89:
Number of disulfide bonds present in insulin
(a) 1
(b) 2
(c) 3
(d) 4
Answer: The correct option is (c)
Explanation: Insulin consists of two peptide chains (A and B) linked by two inter-chain and one intra-chain disulfide bonds, making a total of three disulfide bonds.

Question 90:
Glucagon is a linear peptide hormone of how many amino acids
(a) 28
(b) 29
(c) 30
(d) 31
Answer: The correct option is (b)

Explanation: Glucagon is composed of 29 amino acid residues and plays a critical role in glucose metabolism by promoting gluconeogenesis and glycogenolysis.

Question 91:
Identify a protophilic solvent
(a) Carbon tetrachloride
(b) Carbon disulfide
(c) Chloroform
(d) None of the above
Answer: The correct option is d
Explanation: Proton-donating solvents are those that can accept protons (basic solvents). None of the options listed (non-polar solvents) exhibit protophilic behavior.

Question 92:
Inverse agonist means the ligand binds to a receptor and
(a) produces the effect of an agonist
(b) opposes the effects of an agonist
(c) produces an effect opposite to an agonist
(d) produces an effect like an antagonist
Answer: The correct option is c
Explanation: An inverse agonist binds to the same receptor as an agonist but induces a pharmacological response opposite to that of the agonist.

Question 93:
Which protein is used in immune reactions
(a) Complement proteins
(b) Ubiquitin
(c) Immunophilins
(d) Heat shock proteins
Answer: The correct option is a
Explanation: Complement proteins play a crucial role in the immune response by enhancing the ability of antibodies and phagocytic cells to clear microbes and damaged cells.

Question 94:
Which of the following is not a component of a mass spectrometer
(a) Inlet system
(b) Ion transducer
(c) Sweep generator
(d) Mass analyser
Answer: The correct option is b
Explanation: Mass spectrometers consist of an inlet system, ion source, mass analyzer, and detector. “Ion transducer” is not a standard component; “detector” would be the correct term.

Question 95:
International Yoga Day is celebrated on
(a) 25 May
(b) 21 April
(c) 21 June
(d) 21 July

Answer: The correct option is c
Explanation: International Yoga Day is observed on 21st June, recognized by the United Nations to raise awareness about the benefits of practicing yoga.

Question 96:
How many teams participated in the 2018 FIFA World Cup
(a) 16
(b) 32
(c) 38
(d) 40
Answer: The correct option is b
Explanation: A total of 32 national teams participated in the 2018 FIFA World Cup held in Russia.

Question 97:
The following structure is not found in plant cells
(a) Vacuole
(b) Centriole
(c) Nucleus
(d) Endoplasmic reticulum
Answer: The correct option is b
Explanation: Centrioles are typically found in animal cells and are generally absent in plant cells, which organize their spindle fibers differently.

Question 98:
Which of the following is the toxic compound of linseed
(a) Arabinoxylan
(b) Ricin
(c) Scopoletin
(d) Linamarin
Answer: The correct option is d
Explanation: Linamarin is a cyanogenic glycoside found in linseed that can release hydrogen cyanide upon hydrolysis, making it toxic.

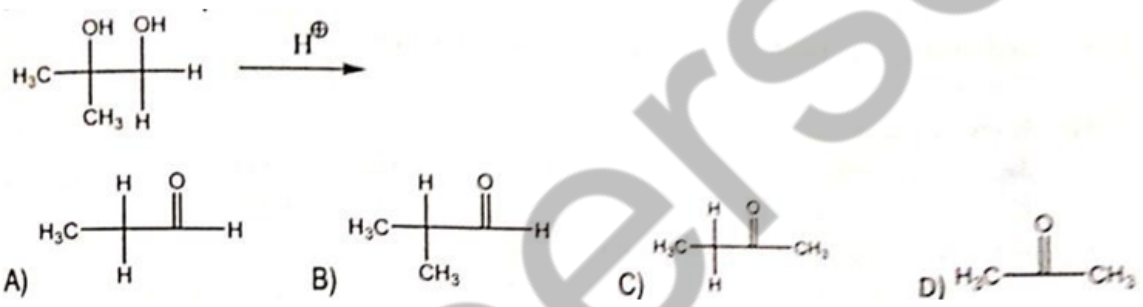
Question 99:
Which of the following genera consists of endospore-forming bacteria
(a) Bacillus
(b) Streptococcus
(c) Saccharomyces
(d) Escherichia
Answer: The correct option is a
Explanation: Bacillus is a genus of Gram-positive, endospore-forming bacteria commonly found in soil and water.

Question 100:
Which of the following types of metabolism do drugs with a high extraction ratio undergo to a significant extent
(a) first-pass
(b) zero-order

(c) intraluminal
(d) nonlinear
Answer: The correct option is a
Explanation: Drugs with high hepatic extraction ratios are significantly metabolized during the first-pass through the liver, reducing their bioavailability.

Question 101:
The liver receives blood supply from the GIT via the
(a) portal artery
(b) portal vein
(c) hepatic artery
(d) hepatic vein
Answer: The correct option is (b)
Explanation: The portal vein carries nutrient-rich blood from the gastrointestinal tract and spleen to the liver for metabolism and detoxification.

Question 102:
The given 1,2-diol undergoes the pinacol pinacolone rearrangement. What will be the structure of the product



Answer: The correct option is (a)
Explanation: In the pinacol-pinacolone rearrangement, 1,2-diols are converted to ketones. The migration of the more stable carbocation leads to the formation of the major product shown in structure (a).

Question 103:
The resolution of the microscope can be improved by
(a) Use of light with shorter wavelengths
(b) Increasing the refractive index of the imaging medium
(c) High numerical aperture
(d) All of the above
Answer: The correct option is (d)
Explanation: All listed methods improve resolution by either enhancing contrast, decreasing diffraction, or improving focusing capacity.

Question 104:
The first plant to be genetically modified was
(a) Tobacco
(b) Rice
(c) Cotton
(d) Arabidopsis thaliana

Answer: The correct option is (a)
Explanation: Tobacco was the first genetically modified plant used in research due to its ease of transformation and rapid growth.

Question 105:
A regulatory body of Japan is
(a) PMDA
(b) EMA
(c) TGA
(d) Medsafe
Answer: The correct option is (a)
Explanation: The Pharmaceuticals and Medical Devices Agency (PMDA) is the Japanese regulatory authority for drugs and medical devices.

Question 106:
Adverse Drug Experience, as defined by Regulation (21 CFR 314.80) is reported to the Division of
(a) Pharmacovigilance
(b) Epidemiology
(c) Medication Error Prevention & Analysis
(d) Risk Management
Answer: The correct option is (a)
Explanation: Under FDA regulation, adverse drug experiences are monitored and reported to the Division of Pharmacovigilance.

Question 107:
IPP and DMAPP condense to produce the precursor to all terpenes and terpenoids
(a) Methylerythritol phosphate
(b) Farnesyl pyrophosphate
(c) HMG COA
(d) Geranyl pyrophosphate
Answer: The correct option is (d)
Explanation: Geranyl pyrophosphate is the product of IPP and DMAPP condensation, acting as a key precursor in the biosynthesis of terpenes and terpenoids.

Question 108:
The synonym of ashwagandha is
(a) Winter cherry
(b) Muskroot
(c) Pashanabhedi
(d) Indian pennywort
Answer: The correct option is (a)
Explanation: Ashwagandha is commonly known as winter cherry, a medicinal herb used in Ayurveda.

Question 109:
Except glucuronidation enzyme, most of the enzymes involved in phase II reactions are mainly located in
(a) Cytosol

(b) Microsomes
(c) Golgi bodies
(d) Lysosomes
Answer: The correct option is (a)
Explanation: Phase II conjugation reactions, such as sulfation and acetylation, typically occur in the cytosol, while glucuronidation mainly occurs in the microsomes.

Question 110:
Heckel's pot is constructed to study ——— of a material
(a) Flowability
(b) Solubility
(c) Compactability
(d) Sustainability
Answer: The correct option is (c)
Explanation: Heckel's equation and apparatus (Heckel's pot) are used to study the compressibility and compactability of powders during tablet formulation.

Question 111:
Hallucinating agents are also called
(a) Thymoleptic
(b) Analeptic
(c) Proleptic
(d) Neuroleptics
Answer: The correct option is b
Explanation: Analeptics are central nervous system stimulants that can cause hallucinations at higher doses. However, the more accurate term for hallucination-inducing agents is *hallucinogens* or *psychedelics*, not analeptics. The given answer may reflect a classification discrepancy.

Question 112:
Which of the following is associated with pseudogout
(a) Deposition of calcium pyrophosphate in large joints
(b) High uric acid levels
(c) Deposition of uric acid in small joints
(d) Lack of response to colchicines
Answer: The correct option is a
Explanation: Pseudogout is caused by the deposition of calcium pyrophosphate dihydrate (CPPD) crystals in joints, most commonly in the knees and other large joints.

Question 113:
Where does glycolysis occur in the cell?
(a) Cell membrane
(b) Nucleus
(c) Cytoplasm
(d) Mitochondria
Answer: The correct option is c
Explanation: Glycolysis is the metabolic pathway that converts glucose into pyruvate and occurs in the cytoplasm of cells.

Question 114:
Which one of the following compounds does not absorb light in the UV/visible spectrum?
(a) Aspirin
(b) Paracetamol
(c) Chloral hydrate
(d) Phenobarbitone
Answer: The correct option is c
Explanation: Chloral hydrate lacks conjugated double bonds or chromophores necessary for UV/visible absorption, unlike the other listed compounds.

Question 115:
Microbial insecticide is
(a) Bacillus pumilus
(b) Bacillus thuringiensis
(c) Bacillus cereus
(d) Bacillus anthracis
Answer: The correct option is b
Explanation: Bacillus thuringiensis is used as a microbial insecticide because it produces toxins that are harmful to certain insect larvae.

Question 116:
Which statement is true about polarography
(a) The diffusion current is caused by the solution stirring
(b) The addition of supporting electrolytes is necessary for a migration current
(c) The diffusion current is proportional to the square root of the concentration of the electroactive species
(d) The magnitude of the diffusion current is proportional to the concentration of electroactive species
Answer: The correct option is d
Explanation: In polarography, the diffusion current is directly proportional to the concentration of the electroactive species, not its square root.

Question 117:
Whiskering is the problem seen in tablets when punches are used
(a) Convex
(b) Concave
(c) Flat
(d) Roughened on surfaces
Answer: The correct option is b
Explanation: Concave punches can lead to whiskering, a defect where fine projections or cracks appear on the tablet due to stress during compression.

Question 118:
Radio waves have
(a) Frequencies 30 Hz to 300 GHz
(b) Wavelength 1 mm to 10,000 km
(c) Both A and B
(d) Neither A nor B

Answer: The correct option is c
Explanation: Radio waves span frequencies from about 30 Hz to 300 GHz, corresponding to wavelengths from 1 mm to 10,000 km.

Question 119:
Which country has won the FIFA for five times
(a) Germany
(b) Uruguay
(c) Brazil
(d) Argentina
Answer: The correct option is c
Explanation: Brazil has won the FIFA World Cup five times — more than any other country (1958, 1962, 1970, 1994, and 2002).

Question 120:
Which of the following is not a prokaryotic cloning vehicle
(a) Escherichia coli
(b) Bacillus subtilis
(c) Agrobacterium tumefaciens
(d) Saccharomyces cerevisiae
Answer: The correct option is d
Explanation: Saccharomyces cerevisiae is a eukaryotic yeast, unlike the other listed prokaryotic organisms used for cloning.

Question 121:
The 'Head space' volume kept in the aerobic reactor ideally is ————% of reactor volume
(a) 10-15
(b) 40-50
(c) 20-25
(d) 10
Answer: The correct option is **(c)**
Explanation: Head space in aerobic bioreactors allows for gas exchange, foam control, and pressure management. Ideally, 20–25% of the total volume is reserved for headspace.

Question 122:
Carrageenan is composed of repeating units of
(a) Galactose
(b) Glucose
(c) Glucose and galactose
(d) Mannose
Answer: The correct option is **(a)**
Explanation: Carrageenan is a sulfated polysaccharide made from galactose units extracted from red seaweed.

Question 123:
Which of the following would not be a mobile phase for reversed-phase liquid chromatography?
(a) Water
(b) Acetonitrile

(c) Methanol
(d) Hexane
Answer: The correct option is **(d)**
Explanation: Reversed-phase LC uses polar mobile phases. Hexane is non-polar and thus not suitable.

Question 124:
NiceProt is
(a) Protein sequence database
(b) Derived Protein database
(c) Protein sequence view
(d) Nucleotide sequence view
Answer: The correct option is **(c)**
Explanation: NiceProt is a part of UniProtKB that provides a protein-centric view, not a full sequence database itself.

Question 125:
SMILES is used in writing chemical structures. It is
(a) Simplified Molecular-Input Line-Entry System
(b) Supporting a molecular image-like entry system
(c) Simplified Medical International Ligand Equivalent System
(d) textual identifier for chemical substances
Answer: The correct option is **(a)**
Explanation: SMILES is a textual representation of chemical structures that allows easy input and database searching.

Question 126:
All the following viruses have reverse transcriptase except
(a) Human immunodeficiency virus
(b) Hepatitis B
(c) Cytomegalovirus
(d) Human T-cell leukemia virus type 1
Answer: The correct option is **(c)**
Explanation: Cytomegalovirus is a DNA virus and does not use reverse transcriptase, unlike retroviruses like HIV and HTLV-1.

Question 127:
Which one of the following is most acidic
(a) o-hydroxy benzoic acid
(b) m-hydroxy benzoic acid
(c) p-hydroxybenzoic acid
(d) p-toluic acid
Answer: The correct option is **(a)**
Explanation: *o*-Hydroxybenzoic acid (salicylic acid) has intramolecular hydrogen bonding, stabilizing the conjugate base, increasing acidity.

Question 128:
Volini is a product of
(a) Sun Pharma

(b) Cadilla
(c) Ranbaxy
(d) Novartis India
Answer: The correct option is **(c)**
Explanation: Volini is a topical pain relief spray/gel originally marketed by Ranbaxy, now part of Sun Pharma.

Question 129:
Relaxing the restrictions and controls imposed on Business and industry means
(a) Liberalisation
(b) Privatisation
(c) Globalisation
(d) None of the above
Answer: The correct option is **(a)**
Explanation: Liberalisation refers to the deregulation of economic activities and the reduction of government restrictions.

Question 130:
Consumer protection in India is ensured by
(a) Consumer Protection Act, A. 1946
(b) Consumer Protection Act, 1986
(c) Consumer Protection Act, 1990
(d) Consumer Protection Act, 1968
Answer: The correct option is **(b)**
Explanation: The Consumer Protection Act, 1986, was enacted to protect consumer rights in India (now superseded by the 2019 Act).

Question 131:
Which of the following bonds requires more energy to stretch
(a) C-H (alkyl)
(b) C-H (aromatic)
(c) C=O (ester)
(d) O-H (alcohol)
Answer: The correct option is d
Explanation: The O-H bond in alcohols is stronger and requires more energy to stretch compared to the other bonds listed.

Question 132:
If you smuggle goods into the country, they may be seized by the customs authority
(a) possessed
(b) punished
(c) confiscated
(d) fined
Answer: The correct option is c
Explanation: Smuggled goods are typically confiscated by customs authorities.

Question 133:
Write the letter that succeeds the letter that is midway between G and W
(a) P

(b) N
(c) O
(d) Q
Answer: The correct option is b
Explanation: The midpoint letter between G and W is M, and the letter succeeding M is N.

Question 134:
Find the wrong number in the series: 7, 28, 63, 124, 215, 342, 511
(a) 28
(b) 124
(c) 215
(d) 342
Answer: The correct option is a
Explanation: The series follows n^3 - 1 pattern (e.g., 2^3-1 =7, 3^3 -1=26, not 28, so 28 is incorrect).

Question 135:
Aprecia Pharmaceuticals' use of Spritam is the first FDA-approved formulation obtained by
(a) Zydis technology (orally dissolving tablet)
(b) Artificial intelligence
(c) ZipDose technology (3-D printing)
(d) Carbon nanotube use
Answer: The correct option is c
Explanation: Spritam is the first FDA-approved 3-D printed drug using ZipDose technology.

Question 136:
Urate transporter inhibitor used as an anti-gout drug is
(a) Lesinurad
(b) Allopurinol
(c) Febuxostat
(d) Colchicine
Answer: The correct option is a
Explanation: Lesinurad is a urate transporter inhibitor used to lower uric acid levels in gout.

Question 137:
The antonym for mountain is
(a) Mound
(b) Hummock
(c) Peak
(d) Valley
Answer: The correct option is d
Explanation: Valley is the antonym of mountain, representing the lowland between mountains.

Question 138:
The molecular formula of cholesterol is
(a) $C_{29}H_{48}O$

(b) $C_{28}H_{44}O$

(c) $C_{27}H_{46}O$

(d) $C_{19}H_{28}O_2$
Answer: The correct option is c
Explanation: Cholesterol's molecular formula is $C_{27}H_{46}O$.

Question 139:
Linezolid is
(a) Oxazolidinone
(b) Thiazolidinedione
(c) Macrolide
(d) Lincosamide
Answer: The correct option is a
Explanation: Linezolid belongs to the oxazolidinone class of antibiotics.

Question 140:
India won the International Hockey World Cup for the first time in
(a) 1948
(b) 1971
(c) 1973
(d) 1975
Answer: The correct option is d
Explanation: India won its first Hockey World Cup in 1975.

Question 141:
Restriction endonucleases, enzymes used most in rDNA technology, are of
(a) Type I
(b) Type II
(c) Type III
(d) Type IV

Answer: The correct option is (b) Type II

Explanation:
Type II restriction enzymes cut DNA at specific recognition sites and are widely used in recombinant DNA technology due to their precision.

Question 142:
A standard HEPA filter must have at least 99.95% or 99.97% of particles whose diameter is
(a) equal to 0.3 µm
(b) less than 0.3 µm
(c) more than 0.3 µm
(d) All of the above

Answer: The correct option is (a) equal to 0.3 µm

Explanation:
HEPA filters are tested for their efficiency in removing particles of 0.3 micrometers, which is considered the most penetrating particle size.

Question 143:
The angle between the minute hand and the hour hand of a clock when the time is 4.20 is
(a) 10°
(b) 5°
(c) 1°
(d) 0°

Answer: The correct option is (a) 10°

Explanation:
At 4:20, the minute hand is at 120°, and the hour hand is at 130°, making the angle between them 10°.

Question 144:
A new gene produced by a combination of portions of two or more coding sequences of different genes is
(a) Chimeric genes
(b) Fusion genes
(c) recombinant genes
(d) cryptogene

Answer: The correct option is (a) Chimeric genes

Explanation:
Chimeric genes are artificially created by joining segments of different genes, often used in genetic engineering.

Question 145:
The quantity of NaOH needed to make a 100 ml solution of 0.5 M strength is
(a) 0.5 gm
(b) 1 gm
(c) 2 gm
(d) 4 gm

Answer: The correct option is (c) 2 gm

Explanation:
$ \text{Molarity (M)} = \frac{\text{moles}}{\text{volume (L)}} $

$ \text{For } 0.5\, M \text{ in } 0.1\, L, \quad \text{moles} = 0.05 $

$ \text{NaOH molar mass} \approx 40\, \text{g/mol} $

$ \therefore \text{mass} = 0.05 \times 40 = 2\, \text{g} $

Question 146:
Which one of the following enzymes is present in the bacteriophage
(a) Transcriptase
(b) Lysozyme

(c) Protease
(d) Urease

Answer: The correct option is (b) Lysozyme

Explanation:
Bacteriophages produce lysozyme to degrade bacterial cell walls, facilitating viral entry or release.

Question 147:
A is two years older than B, who is twice as old as C. If the total ages of A, B, and C are 27, what is the age of B
(a) 8 years
(b) 10 years
(c) 12 years
(d) 14 years

Answer: The correct option is (b) 10 years

Explanation:
Setting C = x, B = 2x, A = 2x + 2, sum = x + 2x + 2x + 2 = 27, solve for x gives B = 10.

Question 148:
Which of the following polymers is used as an ion exchange
(a) Cross-linked polystyrene
(b) Cross-linked polymethylacrylate
(c) Cross-linked dextran
(d) Cross-linked agarose

Answer: The correct option is (a) Cross-linked polystyrene

Explanation:
Cross-linked polystyrene is commonly used as an ion-exchange resin in separation processes.

Question 149:
DPCO is implemented by
(a) NPPA
(b) CDSCO
(c) DCGI
(d) NLEM

Answer: The correct option is (a) NPPA

Explanation:
The National Pharmaceutical Pricing Authority (NPPA) enforces the Drug Price Control Order (DPCO) in India.

Question 150:
Kalmegh is bitter in taste due to
(a) Forskolin

(b) Momordicin
(c) Withanolide
(d) Andrographolide

Answer: The correct option is (d) Andrographolide

Explanation:
Andrographolide is the major bitter compound found in Kalmegh (Andrographis paniculata).

Question 151:
Separation of ions in a mass spectrometer takes place on the basis of which of the following
(a) Mass
(b) Charge
(c) Mass to charge ratio
(d) Molecular weight
Answer: The correct option is **(c)**
Explanation: Ions are separated based on their mass-to-charge ratio (m/z) in a mass spectrometer.

Question 152:
Which intermediate is formed in Wolff's reaction
(a) Carbene
(b) Ketene
(c) Carbocation
(d) Carbanion
Answer: The correct option is **(b)**
Explanation: Wolff's reaction proceeds through a ketene intermediate formed by rearrangement of α-diazo ketones.

Question 153:
The correct order of different types of energies is
(a) Eel >> Evb >> Erot >> Etr
(b) Eel >> Erot >> Evb >> Etr
(c) Eel >> Evb >> Etr >> Erot
(d) Etr >> Evb >> Erot >> Eel
Answer: The correct option is **(a)**
Explanation: Electronic energy (Eel) is the highest, followed by vibrational (Evb), rotational (Erot), and translational (Etr).

Question 154:
Fuming sulphuric acid is the solution of ——— % SO_3 in concentrated. H_2SO_4
(a) 10
(b) 9
(c) 8
(d) 7
Answer: The correct option is **(d)**
Explanation: It contains about 7% SO_3 dissolved in concentrated sulfuric acid.

Question 155:
Which of the following reactions are favoured by polar aprotic solvents
(a) SN1 reactions
(b) SN2 reactions
(c) Both SN1 and SN2 reactions
(d) None of the mentioned
Answer: The correct option is **(b)**
Explanation: SN2 reactions are favoured by polar aprotic solvents because they do not solvate nucleophiles strongly, allowing better nucleophilic attack.

Question 156:
The reaction of alcohol with $SOCl_2$ is.
(a) SN1
(b) SN2
(c) SNAr
(d) SNi
Answer: The correct option is d
Explanation: The reaction of alcohol with $SOCl_2$ proceeds via the SNi (substitution nucleophilic internal) mechanism, where the substitution occurs with retention of configuration.

Question 157:
The energy associated with infrared is enough to make
(a) electronic transitions
(b) vibrational and rotational transitions
(c) a full separation of the electron in the outer shell
(d) An electron moves from an inner orbital
Answer: The correct option is b
Explanation: Infrared radiation provides energy sufficient for vibrational and rotational transitions in molecules, but not enough for electronic transitions.

Question 158:
Which messenger molecules are derived from arachidonic acid
(a) Eicosanoids
(b) Terpenoids
(c) Corticoids
(d) Steroids
Answer: The correct option is a
Explanation: Eicosanoids are signaling molecules synthesized from arachidonic acid, involved in inflammation and other physiological processes.

Question 159:
Which crucial feature of a penicillin is involved in its mechanism of action
(a) Carboxylic acid
(b) β-lactam ring
(c) Acyl side chain
(d) Thiazolidine ring
Answer: The correct option is b

Explanation: The β-lactam ring is essential for penicillin's antibacterial activity as it inhibits bacterial cell wall synthesis.

Question 160:
Which of the following is a long-acting insulin analogue
(a) Lispro
(b) Insulin aspart
(c) Glulisine
(d) Glargine
Answer: The correct option is d
Explanation: Insulin glargine is a long-acting insulin analogue used to provide basal insulin coverage over 24 hours.

Question 161:
Which of the following statements is false for osmotic pumps
(a) The pump has three concentric circles
(b) The innermost is the drug reservoir
(c) The drug is contained in a permeable polyester bag
(d) Outermost rigid rate controlling semipermeable membrane
Answer: The correct option is c
Explanation: The drug reservoir is enclosed within an impermeable container, not a permeable polyester bag.

Question 162:
If the number of protons or neutrons is even, the spin of the nucleus will be which of the following
(a) Integral spin
(b) Half-integral spin
(c) Zero spin
(d) Positive spin
Answer: The correct option is c
Explanation: Nuclei with even numbers of protons and neutrons typically have zero nuclear spin.

Question 163:
Bancroft's rule is applied to which formulation
(a) Suspension
(b) Emulsion
(c) Solution
(d) Micelles
Answer: The correct option is b
Explanation: Bancroft's rule states that the phase in which the emulsifier is more soluble forms the continuous phase of an emulsion.

Question 164:
If the Zeta potential of a colloidal dispersion is 0 to ±5 mV, that colloid shows
(a) Rapid coagulation or flocculation
(b) Incipient instability
(c) Moderate stability

(d) Good stability
Answer: The correct option is a
Explanation: Low zeta potential (0 to ±5 mV) leads to rapid coagulation or flocculation due to weak electrostatic repulsion.

Question 165:
The term anomers of glucose refers to
(a) isomers of glucose that differ in configuration at carbons one and four(C-1 and C-4)
(b) a mixture of D-glucose and L-glucose
(c) enantiomers of glucose
(d) isomers of glucose that differ in configuration at carbon one (C-1)
Answer: The correct option is d
Explanation: Anomers differ in configuration specifically at the anomeric carbon (C-1) of glucose, forming α and β forms.

Question 166:
The first EMR (exclusive marketing right) was granted in India which created controversy was to
(a) Cipla
(b) Ranbaxy
(c) Novartis
(d) Sun Pharma
Answer: The correct option is d
Explanation: Sun Pharma was the first company to receive an EMR in India, which sparked debate over patent laws and access to medicines.

Question 167:
The dibenzazepine ring is present in
(a) Cyproheptadine
(b) Imipramine
(c) Amitriptyline
(d) Azatadine
Answer: The correct option is b
Explanation: Imipramine contains the dibenzazepine ring, characteristic of tricyclic antidepressants.

Question 168:
Which of the following is a weak anesthetic agent to produce anesthesia by itself
(a) Nitrous oxide
(b) Chloroform
(c) Ketamine
(d) Ether
Answer: The correct option is a
Explanation: Nitrous oxide is a weak anesthetic and is usually used with other agents for full anesthesia.

Question 169:
Oseltamivir (Tamiflu) and Zanamivir are structural mimics of
(a) Sialic acid

(b) Teichoic acid
(c) Salicylic acid
(d) Mucic acid
Answer: The correct option is a
Explanation: These antiviral drugs mimic sialic acid to inhibit viral neuraminidase.

Question 170:
What is the indication of the flow property?
(a) Bridging
(b) Arching
(c) Angle of repose
(d) Rat holing
Answer: The correct option is c
Explanation: Angle of repose measures the flowability of powders and granules.

Question 171:
Which ester hydrolysis mechanism is not observed
(a) AAC^2 and AAL^1
(b) BAC^2 BAL^1
(c) AAC^1 and BAL^2
(d) AAL^2 and BAC^1
Answer: The correct option is d
Explanation: AAL2 and BAC1 mechanisms are theoretical and have not been observed experimentally.

Question 172:
———— is an excellent 'green' solvent as well as a greenhouse gas
(a) Methanol
(b) CFCs
(c) Ethyl acetate
(d) Carbon Dioxide
Answer: The correct option is d
Explanation: Carbon dioxide is a green solvent in supercritical form, but also contributes to the greenhouse effect.

Question 173:
Drugs of choice for the treatment of cerebral malaria are
(a) Chloroquine, mefloquine
(b) Pyrimethamine, sulphamethoxazole
(c) Artemisinin derivatives, quinine
(d) Atovaquone, tetracycline
Answer: The correct option is c
Explanation: Artemisinin derivatives and quinine are effective for cerebral malaria due to their potent antiparasitic action.

Question 174:
The meaning of mitigate is
(a) Denote
(b) Dedicate

(c) Divulge
(d) Diminish
Answer: The correct option is d
Explanation: To mitigate means to reduce or diminish the severity of something.

Question 175:
The methyl isocyanate gas tragedy occurred in
(a) Chernobyl
(b) Bhopal
(c) Fukushima
(d) Merrimack Valley
Answer: The correct option is b
Explanation: The Bhopal disaster involved a massive release of methyl isocyanate gas, causing thousands of deaths.

Question 176:
Find the number whose square root is twice its cubic root
(a) 4
(b) 16
(c) 64
(d) 128
Answer: The correct option is c
Explanation: For number x, $\sqrt{x} = 2\sqrt[3]{x}$. Solving gives x = 64.

Question 177:
2H-chromen-2-one is
(a) Chalcone
(b) Aurone
(c) Coumarin
(d) Psoralen
Answer: The correct option is c
Explanation: 2H-chromen-2-one is the chemical name for Coumarin, a fragrant compound found in plants.

Question 178:
Golden rice is fortified with ——— by means of genetic modification
(a) Vitamin D
(b) Vitamin A
(c) Vitamin C
(d) Vitamin B5
Answer: The correct option is b
Explanation: Golden rice is genetically engineered to produce beta-carotene, a precursor of Vitamin A.

Question 179:
The award is bestowed as the highest recognition for medical practitioners in India
(a) Kalinga
(b) B.C.Roy

(c) Ramanujan
(d) Shantiswarup Bhatnagar
Answer: The correct option is b
Explanation: The B.C.Roy Award is the highest medical honor in India, recognizing excellence in medicine.

Question 180:
Which of the following is used in the electron microscope
(a) Beam of LASER
(b) Glass optical system
(c) Electron beams and magnetic fields
(d) None of the above
Answer: The correct option is c
Explanation: Electron microscopes use electron beams focused by magnetic fields to produce images.

Question 181:
All of the coenzymes listed participate in electron transfer EXCEPT
(a) FAD, NAD+
(b) Biotin
(c) Lipoic acid
(d) Vitamin C
Answer: The correct option is b
Explanation: Biotin functions mainly in carboxylation reactions, not electron transfer.

Question 182:
Global warming is due to an increase in
(a) Methane in the atmosphere
(b) CO2 in the atmosphere
(c) Water vapour
(d) Methane and CO2
Answer: The correct option is d
Explanation: Both methane and carbon dioxide are significant greenhouse gases contributing to global warming.

Question 183:
The p53 protein normally promotes
(a) Tumor formation
(b) DNA replication
(c) Cell division
(d) Apoptosis
Answer: The correct option is d
Explanation: p53 is a tumor suppressor protein that induces apoptosis in damaged cells.

Question 184:
Given below are words, three of which convey the same meaning, and one does not. Find it
(a) Convulse
(b) Soothe
(c) Compose

(d) Assuage
Answer: The correct option is a
Explanation: "Convulse" means to shake violently, while the others mean to calm or relieve.

Question 185:
Which of the following parameters is the same for molecules of all gases at a given temperature
(a) Mass
(b) Momentum
(c) Speed
(d) Kinetic energy
Answer: The correct option is d
Explanation: At a given temperature, all gas molecules have the same average kinetic energy regardless of their mass.

Question 186:
Gamma-glutamyl cysteinyl glycine is commonly known as
(a) Glucagon
(b) Bradykinin
(c) Glutathione
(d) Incretin
Answer: The correct option is c
Explanation: Glutathione is a tripeptide antioxidant made of glutamate, cysteine, and glycine, playing a key role in cellular defense against oxidative damage.

Question 187:
Isosteric replacement of sulfur with carbon in cephalexine gives
(a) Loracarbef
(b) Mepropenem
(c) Aztreonam
(d) Cefotetan
Answer: The correct option is a
Explanation: Loracarbef is a carbacephem antibiotic derived by replacing the sulfur atom with carbon in cephalexin, enhancing stability.

Question 188:
Which is related to the share market
(a) NASSCOM
(b) NASDAQ
(c) NASDOC
(d) NASA
Answer: The correct option is b
Explanation: NASDAQ is a major electronic stock exchange in the US, associated with trading shares of companies.

Question 189:
Which one is not a soft/ambient ionization technique
(a) Electron ionization (EI)
(b) Fast atom bombardment (FAB)

(c) Chemical ionization (CI)
(d) Atmospheric-pressure chemical ionization (APCI)
Answer: The correct option is a
Explanation: Electron ionization causes extensive fragmentation and is considered a hard ionization technique, unlike the other soft ionization methods.

Question 190:
A person travels 6 km west, then 5 km north, then 6 km west. Where is he with respect to his starting position?
(a) 13 km east
(b) 13 km northeast
(c) 13 km northwest
(d) 13 km west
Answer: The correct option is c
Explanation: Total displacement is 12 km west and 5 km north, resulting in 13 km northwest by the Pythagorean theorem.

Question 191:
Which of the following diagrams/sets indicates the relation between women, mothers, and parents?

Answer: The correct option is a
Explanation: Diagram A correctly shows mothers as a subset of women and parents, representing their relationships accurately.

Question 192:
Interleukins are mainly synthesized by
(a) Erythrocytes
(b) Lymphocytes
(c) Granulocytes
(d) Thrombocytes
Answer: The correct option is b
Explanation: Lymphocytes produce interleukins, which are signaling molecules in immune responses.

Question 193:
NLO: RPS:: ?: ZXA
(a) VUW
(b) VTR
(c) VTW
(d) TRP
Answer: The correct option is c
Explanation: The letter shifts from NLO to RPS, matching the pattern for VTW to ZXA.

Question 194:
A metabolic pathway that is involved in both energy production and biosynthesis is
(a) Anaplerotic
(b) Amphibolic
(c) Duplibolic
(d) Cataplerotic
Answer: The correct option is b
Explanation: Amphibolic pathways function both catabolically and anabolically, linking energy production and biosynthesis.

Question 195:
If there is less than a ——— difference in the minimum lethal dose and minimum effective dose of blood, the use of the drug requires careful patient monitoring and dose adjustment
(a) 2 fold
(b) 3 fold
(c) 4 fold
(d) None of the above
Answer: The correct option is a
Explanation: Drugs with less than a 2-fold difference between effective and lethal doses have narrow therapeutic indices needing monitoring.

Question 196:
Beta-lactam antibiotics are most likely to degrade as a result of
(a) Solvolysis
(b) Oxidation
(c) Photolysis
(d) None of the above
Answer: The correct option is a
Explanation: Beta-lactam rings are susceptible to solvolysis, leading to drug degradation and loss of activity.

Question 197:
Which of the following has 21 carbons
(a) Cholesterol
(b) Pregnenolone
(c) Estrone
(d) Testosterone
Answer: The correct option is b
Explanation: Pregnenolone is a C21 steroid and a precursor for many steroid hormones.

Question 198:
Which enzyme converts cAMP to AMP
(a) Adenylate cyclase
(b) ATPase
(c) Phosphodiesterase
(d) Adenylate kinase
Answer: The correct option is c
Explanation: Phosphodiesterase hydrolyzes cAMP into AMP, regulating cellular signaling.

Question 199:
Liposomal drug delivery is developed for which antifungal drug
(a) Griseofulvin
(b) Flucytosine
(c) Itraconazole
(d) Amphotericin B
Answer: The correct option is d
Explanation: Liposomal formulations of Amphotericin B reduce toxicity and improve delivery.

Question 200:
To ensure the availability of medicines at appropriate prices, DPCO was introduced in
(a) 1985
(b) 1995
(c) 2005
(d) 2015
Answer: The correct option is b
Explanation: The Drug Price Control Order (DPCO) was introduced in India in 1995 to regulate medicine prices.