

CAREERS 360

PRACTICE **Series**

MH CET Law 2026

Maths Practice

Question



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ABOUT THIS eBook

Explore the world of Maths with our special ebook designed for MH CET Law aspirants.

What's in the ebook?

In this ebook, we provided 10 sets of practice questions on diverse topics that can be asked in the MH CET Law exam.

What makes this ebook super helpful for the students?

To make sure you're fully prepared, we've included 10 practice sets.

Each test has 10 carefully crafted questions that stimulate the exam conditions. This helps you get used to the types of questions you might face.

In addition, we provide an answer key and detailed solutions. It's not just about getting the right answer – we show you step-by-step how to solve problems, boosting your confidence for the real exam.

Furthermore, Our ebook goes the extra mile by being a one-stop resource.

It includes the MH CET Law GK and Legal Reasoning Practice Questions PDF along with the MH CET Law (3 and 5-year) Law Programs 10 Free Mock Tests. You can easily find them on the "**Other Useful Resources**" page.

Embrace your preparation with confidence and set yourself on the path to success.

BRIEF INTRODUCTION TO MATHS

Mathematics is divided into three parts which are Algebra, Arithmetic and Geometry. They are all branches of mathematics, each with its distinct focus and methods. Here's a brief elaboration on the differences between them:

Algebra			
Algebra deals with symbols and the rules for manipulating these symbols to solve equations and analyze mathematical relationships.	It involves the study of mathematical operations such as addition, subtraction, multiplication, division, exponentiation, and root extraction, but in a generalized form using variables and symbols rather than specific numbers.	Algebra includes equations, inequalities, polynomials, functions, matrices, and complex numbers.	It is beneficial for solving problems involving unknown quantities and understanding patterns and structures in mathematical systems.
Arithmetic			
Arithmetic is the most elementary branch of mathematics, focusing on basic operations and properties of numbers.	It involves the study of addition, subtraction, multiplication, division, and their properties, typically using concrete numerical values rather than abstract symbols.	Arithmetic deals primarily with numerical computations and elementary mathematical operations involving real numbers, fractions, decimals, and integers.	It is fundamental for everyday calculations, financial transactions, and basic problem-solving situations.
Geometry			
Geometry is the branch of mathematics concerned with the properties, measurement, and relationships of points, lines, angles, surfaces, and solids.	It studies spatial relationships and shapes, including properties such as length, area, volume, angles, and curvature.	Geometry encompasses various topics, including Euclidean geometry (the study of shapes and figures in two and three dimensions), analytic geometry (using algebraic methods to study	It has applications in diverse fields such as architecture, engineering, physics, computer graphics, and astronomy.

		geometric concepts), differential geometry (dealing with curves and surfaces using calculus), and topology (the study of spatial properties unaffected by continuous deformations).	
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In conclusion, algebra focuses on symbolic manipulation and relationships between variables, whereas, arithmetic deals with basic numerical operations and properties of numbers, and geometry studies the properties and relationships of shapes and spatial configurations. Each branch has its own set of concepts, techniques, and applications, but they are interconnected and often used together to solve complex mathematical problems.

FEW TIPS AND TRICKS TO IMPROVE YOUR MATHEMATICAL SKILLS



Emphasize Practice:

Achieving proficiency in math requires more than just reading or listening. Actively engage in problem-solving to enhance your skills. The more problems you solve, the better equipped you'll be. Practice different problem-solving approaches to build versatility.

Learn from Mistakes:

When practicing, thoroughly analyze your solutions, especially if you make mistakes. Understand the shortcomings in your problem-solving approach. Identifying errors helps strengthen your skills and prevents repeating the same mistakes.



Grasp Key Concepts:

Avoid memorizing processes; instead, focus on understanding the underlying logic. Mathematics builds on sequential concepts, so ensure a solid grasp of fundamental principles before tackling more complex problems. Understanding the "why" is crucial for long-term success.

Address Doubts:

When stuck on a part of a problem, resist the urge to skip it. Take the time to comprehend the solution process. Once you understand the initial problem, use it as a foundation to progress through the entire question. Math mastery requires time, patience, and a willingness to confront challenges.



Optimize Your Study Environment:

Create a distraction-free study environment for math, a subject demanding high concentration. Background music, chosen carefully for a relaxing atmosphere, can aid focus. Eliminate distractions to enhance your ability to solve complex problems in geometry, algebra, or trigonometry.

Build a Mathematical Dictionary:

Compile notes, flashcards, or cheat sheets containing essential math concepts, terminology, and definitions. Include meanings, key points, and sample answers for quick reference. This resource will serve as a handy tool for reviewing and reinforcing your understanding.

**Apply Math to Real-World Problems:**

Relate mathematical concepts to real-world scenarios to make them more tangible. Applying math to practical situations can alter your perspective and enhance comprehension. For instance, use probability to assess risks in everyday decisions, such as buying a lottery ticket.



Remember to approach exams with confidence, knowing you've prepared thoroughly. Collaborating with a study partner can also be beneficial for discussing and solving complex problems.

Let's begin with the Study Material.

SET - 1

Q1. Directions: Study the table and answer the question. The number of five types of cycles manufactured by a company over the years is given below:

Year s	Types of cycles (in 1000)				
	A	B	C	D	E
1997	200	150	78	90	65
1998	150	180	100	105	70
1999	180	175	92	110	85
2000	195	160	120	125	75
2001	220	185	130	135	80

What was the approximate percentage increase in production of the D type of the cycle from 1998 to 2000?

- A)10
- B)19
- C)15
- D)17

Q2. The average of 20 numbers is calculated as 35. It is discovered later on that while calculating the average, one number, 85, was misread as 45. The correct average is:

- A)36
- B)36.5
- C)37

D)37.5

Q3. The diameter of a wheel on a bicycle is 21 cm. The cyclist takes 45 minutes to reach a destination at a speed of 16.5 km/h. How many revolutions will the wheel make during the journey?

A)12325

B)18750

C)21000

D)24350

Therefore, during the journey, the wheel will make $\left(\frac{1237500}{66}\right) = 18750$ revolutions.
Hence, the correct answer is 18750 revolutions.

Q4. The diameter of a wheel on a bicycle is 21 cm. The cyclist takes 45 minutes to reach a destination at a speed of 16.5 km/h. How many revolutions will the wheel make during the journey?

A)12325

B)18750

C)21000

D)24350

Q5. The ratio of the present ages of the two boys is 3:4. After 3 years, the ratio of their ages will be 4:5. The ratio of their ages after 21 years will be:

A)14 : 17

B)17 : 19

C)11 : 12

D)10 : 11

Q6. The ratio of A's age to B's age is 4 : 3. A will be 26 years old after 6 years. The age of B now is:

A) $19\frac{1}{2}$ years

B) 12 years

C) 21 years

D) 15 years

Q7. By selling a bag for Rs. 230, a profit of 15% is made. The selling price of the bag, when sold at 20% profit, would be:

A) Rs. 250

B) Rs. 205

C) Rs. 240

D) Rs. 200

Q8. There are 1400 students in a school, 25% of them wear spectacles and $\frac{2}{7}$ th of those wearing spectacles are boys. How many girls in the school wear spectacles?

A) 250

B) 100

C) 200

D) 300

Q9. If 60% of the students in a school are boys and the number of girls is 812, how many boys are there in the school?

A) 1128

B) 1218

C) 1821

D) 1281

Q10. The ratio of the present ages of R and S is 11 : 17. 11 years ago, the ratio of their ages was 11 : 20. What is R's present age (in years)?

A)51

B)33

C)22

D)40

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SET - 2

Q1 The average mark obtained in a class of 50 students is 70%. The average of the first 25 is 60% and that of 24 is 80%. What were the marks obtained by the last student?

- A)90%
- B)60%
- C)80%
- D)70%

Q2. In an examination, 65% of students pass in History and 55% pass in Hindi. If 5% of students fail in both subjects, then what is the percentage of students who have passed in both subjects?

- A)15
- B)20
- C)25
- D)30

Q3. A student has to score 40% to pass. He gets 67 and fails by 13 marks. What are the maximum marks?

- A)300
- B)200
- C)150
- D)240

Q4. The ratio of the volume of two cones is 2:3, and the ratio of the radii of their bases is 1:2. The ratio of their heights is:

- A)3:8

B)8:3

C)4:3

D)3:4

Q5. An inverted conical– shaped vessel is filled with water to its brim. The height of the vessel is 8 cm and the radius of the open end is 5 cm. When a few solid spherical metallic balls each of radius $\frac{1}{2}$ cm are dropped in the vessel, 25% water is overflowed. The number of balls is:

A)100

B)400

C)200

D)150

Q6. Three bottles of equal capacity contain mixtures of milk and water in ratios 2 : 5, 3 : 4 and 4 : 5 respectively. These three bottles are emptied into a large bottle. What will be the ratio of milk and water respectively in the large bottle?

A)73 : 106

B)73 : 116

C)73 : 113

D)73 : 189

Q7. In a mixture of 25 litres, the ratio of milk to water is 4 : 1. Another 3 litres of water is added to the mixture. The ratio of milk to water in the new mixture is:

A)5 : 1

B)5 : 2

C)5 : 3

D)5 : 4

Q8. A trader sold a cycle at a loss of 10%. If the selling price had been increased by Rs. 200, there would have been a gain of 6%. The cost price of the cycle is:

- A)Rs. 1200
- B)Rs. 1205
- C)Rs. 1250
- D)Rs. 1275

Q9. If the selling price of 40 articles is equal to the cost price of 50 articles, the loss or gain percent is:

- A)25% gain
- B)20% gain
- C)25% loss
- D)20% loss

Q10. By selling a tape recorder for Rs. 1040, a man gains 4%. If he sells it for Rs. 950, his loss will be:

- A)5%
- B)4%
- C)4.5%
- D)9%

SET - 3

Q1. Three numbers are in the ratio 5 : 7 : 12. If the sum of the first and the third numbers is greater than the second number by 50. The sum of the three numbers is:

- A)125
- B)120
- C)95
- D)85

Q2. Two numbers whose sum is 84, cannot be in the ratio of:

- A)5 : 7
- B)13 : 8
- C)1 : 3
- D)3 : 2

Q3. If the radius of a cylinder is increased by 25%, by how much per cent the height must be reduced, so that the volume of the cylinder remains the same.

- A)36
- B)56
- C)64
- D)46

Q4. A solid cone of height 36 cm and radius of base 9 cm is melted to form a solid cylinder of radius 9 cm and height 9 cm. What percent of the material is wasted in this process?

- A)25

- B)0
- C)5
- D)10

Q5. If the price of sugar increases by 20%, one can buy 2 kg less for Rs. 50. What is the amount of sugar that could be bought before the price hike?

- A)10 kg
- B)12 kg
- C)14 kg
- D)16 kg

Q6. Due to a price hike of 20%, 4 kg less sugar is available for Rs 120. What is the initial price per kg of sugar?

- A)Rs. 5 per kg
- B)Rs. 4 per kg
- C)Rs. 6 per kg
- D)Rs. 5.5 per kg

Q7. In 2001, the price of a building was 80% of its original price. In 2002, the price was 60% of its original price. By what percentage did the price decrease?

- A)15%
- B)20%
- C)25%
- D)30%

Q8. Calculate the mean from the following table.

Score s	Frequencies
0-10	2

10-20	4
20-30	12
30-40	21
40-50	6
50-60	3
60-70	2

- A)34.2
 B)33.4
 C)32.6
 D)35.8

Q9. The radius of the incircle of an equilateral ΔABC of side $2\sqrt{3}$ cm is x cm. The value of x is:

- A) $\frac{1}{3}$
 B) $\frac{1}{2}$
 C)1
 D) $\sqrt{3}$

Q10. ABCD is a parallelogram in which $AB = 7$ cm, $BC = 9$ cm and diagonal $AC = 8$ cm. What is the length (in cm) of the other diagonal?

- A)14
 B) $14\sqrt{2}$
 C)7
 D) $7\sqrt{2}$

SET - 4

Q1. If the cost price of 12 pens is equal to the selling price of 8 pens, the gain percent is?

- A] 50%
- B] 40%
- C] 20%
- D] 30%

Q2. Tarun got 30% concession on the labeled price of an article and sold it for Rs. 8750 with 25% profit on the price he bought. What was the labeled price?

- A] 10000
- B] 12000
- C] 15000
- D] 16000

Q3. Find the Remainder of $\frac{78^{193}}{97}$

- A] 97
- B] 193
- C] 41
- D] None

Q4. Find the simple interest earned on Rs.20000 for 2 years at 10% p.a.

- A] Rs.4500
- B] Rs.2000
- C] Rs.4000
- D] Rs.6000

Q5. If Rs.2000 amounts to Rs.2500 in 2 years at simple interest, what is the rate of interest per annum?

- A] 8%
- B] 37.5%
- C] 25%
- D] 12.5%

Q6. Excluding stoppages, the speed of a bus is 54kmph and including stoppages, it is 45kmph. For how many minutes does the bus stop per hour?

- A] 9
- B] 10
- C] 12
- D] 20

Q7. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was

reduced by 200 km/hr and the time of flight increased by 30 minutes. The duration of the flight is:

- A] 1 hour
- B] 5 hour
- C] 6 hour
- D] 7 hour

Q8. A boat goes a certain distance at 30 km/hr and comes back the same distance at 60 km/hr. What is the average speed (in km/hr) for the total journey?

- A] 45
- B] 40
- C] 35
- D] 50

Q9. X can do a piece of work in 20 days working 7 hours a day. The work is started by X and on the second day one man whose capacity to do the work is

twice that of X, joined. On the third day another man whose capacity is thrice that of X, joined and the process continued till the work was completed. In how many days will the work be completed, if everyone works for four hours a day?

- A] 5 days
- B] 8 days
- C] 6 days
- D] 4 days

Q10. There are two solutions of sulphuric acid (acid + water) with concentration of 50% and 80% respectively. They are mixed in a certain ratio to get a 62% sulphuric acid solution. This solution is mixed with 6 liters of water to get back 50% of the solution. How much of the 80% solution has been used in the entire process?

- A] 15 liters
- B] 12 Liters
- C] 10 Liters
- D] None of these

SET - 5

Q1. The ratio of two numbers is 2:5. Their LCM is 120. Determine the second number.

- A] 24
- B] 45
- C] 60
- D] 85

Q2. The present worth of Rs. 1404 due in two equal half-yearly installments at 8% per annum simple interest is:

- A] Rs. 1500
- B] Rs. 1325
- C] Rs. 1450
- D] Rs. 1250

Q3. A card is drawn from a deck of 52 cards. Find the probability of getting a king or a heart or a red card.

- A] $\frac{6}{13}$
- B] $\frac{7}{13}$
- C] $\frac{1}{13}$
- D] $\frac{2}{13}$

Q4. Find the Remainder of $\frac{3^{1002}}{33}$

- A] 1
- B] 3
- C] 9
- D] 33

Q5. Find the Remainder of $\frac{100!}{101}$

- A] 1
- B] 0
- C] 101
- D] None of these

Q6. No. of zeros at the end of $(45!)^{450}$

- A] 10
- B] 450
- C] 10^{45}
- D] 4500

Q7. No. of zeros at the end of $(31)! \times (42)! \times (100!)$

- A] 48
- B] 16
- C] 6
- D] 40

Q8 Two numbers, both greater than 29, have GCD = 29 and LCM = 4147. The sum of the numbers is:

- A] 669
- B] 696
- C] 766
- D] 767

Q9. During the first year, the population of the town increased by 4% and during the second year it diminished by 4%. If at the end of the second year its population was 24960, what was its population at the beginning of the first year?

- A] 24960

- B] 25200
- C] 24000
- D] 25000

Q10. If 97% of the students are present in a class and 18 students are absent, find the total number of students in the class.

- A] 800
- B] 600
- C] 700
- D] 575

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SET - 6

Q1. What is the unit digit in the product (684 x 759 x 413 x 676)?

- A] 6
- B] 8
- C] 2
- D] None of these

Q2. A sum of money is lent at a certain rate of interest at compound interest. If, instead the same amount was lent at simple interest the interest for the first two years reduces by Rs.160 and that for the first three years reduces by Rs.488. Find the sum

- A] Rs.52000
- B] Rs.64000
- C] Rs.32000
- D] Rs.12000

Q3. The difference between the compound interest and simple interest on a certain sum at 12% per annum for 2 years is Rs.126.72. Find the sum.

- A] Rs.8800
- B] Rs.7800
- C] Rs.8000
- D] Rs.8500

Q4. If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance traveled by him is:

- A] 50 km
- B] 56 km
- C] 70 km
- D] 80 km

Q5. A train can travel 50 % faster than a car. Both start from point A at the same time and reach point B away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:

- A] 100 kmph
- B] 120 kmph
- C] 210 mph
- D] 200kmph

Q6. 2.A boat goes a certain distance at 30 km/hr and comes back the same distance at 60 km/hr. What is the average speed (in km/hr) for the total journey?

- A] 45
- B] 40
- C] 35
- D] 55

Q7. Ram completes 60% of a task in 15 days and then takes the help of Rahim and Rachel. Rahim is 50% as efficient as Ram is and Rachel is 50% as efficient as Rahim is. In how many more days will they complete the work?

- A] 40/7
- B] 20/7
- C] 30/7
- D] 10/7

Q8. Three taps A, B and C can fill a tank in 12, 15 and 20 hours respectively. If A is open all the time and B and C are open for one hour each alternately, the tank will be full in:

- A] 7 hour

- B] 5 hour
- C] 3 hour
- D] 4 hour

Q9. Two solutions of 90% and 97% purity are mixed resulting in 21 liters of mixture of 94 % purity. How much is the quantity of the first solution in the resulting mixture?

- A] 15 liters
- B] 12 liters
- C] 9 liters
- D] 6 liters

Q10. Length of one side of a parallelogram is 10 cm, then the length of its adjacent side, when perimeter of parallelogram given as 50 cm is

- A] 15cm
- B] 12cm
- C] 10cm
- D] 16cm

SET - 7

Q1. In the land of the famous milkman Merghese Durian, a milkman sells his buffalo for Rs. 720 at some profit. Had he sold his buffalo at Rs. 510, the quantum of the loss incurred would have been double that of the profit earned. What is the cost price?

- A] 650
- B] 750
- C] 1350
- D] 1250

Q2.A Camera shop allows a discount of 10% on the advertised price of a camera. What price must be marked on the camera, that costs him Rs. 600, so that he makes a profit of 20%?

- A] 720
- B] 800
- C] 750
- D] 350

Q43. Find the remainder when 47^{100} is divided by 100

- A] 1
- B] 41
- C] 61
- D] 81

Q4. Find the effective rate of interest if the normal rate of interest is 10% p.a. and the interest is compounded every six months.

- A] 21.5%
- B] 10.25%
- C] 5.25%
- D] 10%

Q5. Find the compound interest on Rs. 8000 at 4% per annum for 2 years compounded annually

- A] R 652.80`
- B] R 452.80
- C] R 652.80
- D] R 552.80

Q6. In covering a distance of 30 km, Abhay takes 2 hours more than Sameer. If Abhay doubles his speed, then he would take 1 hour less than Sameer. Abhay's speed is:

- A] 5 kmph
- B] 10 kmph
- C] 12 kmph
- D] 8 kmph

Q7. Robert is traveling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.?

- A] 8 kmph
- B] 12 kmph
- C] 10 kmph
- D] 14 8 kmph

Q8. A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

- A] 12.5 km/hr
- B] 5.5 km/hr
- C] 6.5 km/hr
- D] 10 km/hr

Q9. A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

- A] 12 days
- B] 15 days
- C] 10 days
- D] 25 days

Q10. There are two containers: the first contains 500ml of alcohol, while the second contains 500 ml of water. Three cups of alcohol from the first container is removed and is mixed well in the second container. Then three cups of this mixture is removed and is mixed in the first container. Let 'A' denote the proportion of water in the first container and 'B' denote the proportion of alcohol in the second container. Then A,

- A] $A > B$
- B] $A < B$
- C] $A = B$
- D] Cannot be determined

SET - 8

Q1. The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit?

- A] 3000
- B] 2000
- C] 4000
- D] 2500

Q2. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

- A] 16
- B] 15
- C] 12
- D] 14

Q3. Remainder when $(1! + 2! + 3! + \dots + 4000!)$ is divided by 7

- A] 7
- B] 1
- C] 5
- D] None of these

Q4. Find the present value (in Rs.) of Rs.3000 due after 5 years at 10% p.a. simple interest.

- A] 1500
- B] 1800
- C] 2000
- D] 2500

Q5. A sum of money invested at simple interest amounts to Rs 2480 at the end of four years and Rs.4080 at the end of eight years. Find the principal.

- A] Rs.2040
- B]Rs. 1480
- C] Rs.1240
- D] Rs.880

Q6.A man completes a journey in 10 hours. He travels the first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

- A] 220 km
- B] 224 km
- C] 200 km
- D] 240 km

Q7.The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is:

- A] 12.5 km/hr
- B] 27 km/hr
- C] 20 km/hr
- D] 87.5 km/hr

Q8. A train is running at a speed of 116 km/h. The distance covered by the train in meters in 18 seconds is:

- A] 580 meters
- B] 480 meters
- C] 280 meters
- D] 380 meters

Q9. P, Q and R can do work in 20, 30 and 60 days respectively. How many days does it take to complete the work if P does the work and he is assisted by Q and R on every third day?

- A] 15 days
- B] 10 days
- C] 25 days
- D] 45 days

Q10. A large tanker can be filled by two pipes A and B in 60 minutes and 40 minutes respectively. How many minutes will it take to fill the tanker from an empty state if B is used for half the time and A and B fill it together for the other half?

- A] 15 min
- B] 20 min
- C] 30 min
- D] 40 min

SET - 9

Q1. ABCD is a rhombus, then the measure of $\angle CDB$ is

- A] 30°
- B] 60°
- C] 40°
- D] 50°

Q2. The monthly salaries of two persons are in the ratio of 4:7. If each receives an increase of Rs.25 in the salary, the ratio is altered to 3: 5. Find their respective salaries.

- A] 120 & 210
- B] 80 & 140
- C] 180 & 300
- D] 200 & 350

Q3. The true discount on Rs. 1760 due after a certain time at 12% per annum is Rs. 160. The time after which it is due is:

- A] 6 months
- B] 8 months
- C] 5 months
- D] 10 months

Q4. In a game two players, A and B take turns in throwing a pair of fair dice starting with player A and a total of scores on the two dice, in each throw is noted. A wins the game if he throws a total of 6 before B throws a total of 7 and B wins the game if he throws a total 7 before A throws a total six. The game stops as soon as either of the players wins. The probability of A winning the game is:

- A] $\frac{31}{61}$
- B] $\frac{5}{6}$

- $\frac{30}{61}$
C] $\frac{30}{61}$
D] 1

Q5. What is the largest number which divides 97 and 65 leaving remainders of 7 and 5 respectively?

- A] 60
B] 30
C] 15
D] 10

Q6. What is the largest number that divides 23, 37 and 79 leaving the same remainder in each case?

- A] 2
B] 7
C] 12
D] 14

Q7. What is the last remainder when 223 is successively divided by 4, 5 and 6?

- A] 5
B] 0
C] 3
D] 1

Q8. Which of the following leaves no remainder when divided by 100?

- A] $11^{10} - 1$
B] $10^8 - 10$
C] $4^6 - 3^6$
D] $5^6 - 5^2$

Q9. The value of $p(2)$ of the polynomial is

- A] 3
- B] -3
- C] 2
- D] -2

Q10. Which of the following is the smallest five digit number which when divided by 8, 11 and 24 leaves a remainder of 5 in each case?

- A] 10301
- B] 10125
- C] 10061
- D] 10037

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SET - 10

Q1. The percentage profit made when an article is sold for Rs. 78 is twice as much as when it is sold for Rs. 69. The cost of the article is:

- A)Rs. 60
- B)Rs. 51
- C)Rs. 55.50
- D)Rs. 70

Q2. The profit (in Rs.) after selling an article for Rs. 524 is the same as the loss (in Rs.) after selling it for Rs. 452. The cost price of the article is:

- A)Rs. 480
- B)Rs. 485
- C)Rs. 488
- D)Rs. 500

Q3. Two numbers are in the ratio 3 : 5. If 6 is added to each of them the ratio becomes 2 : 3. The numbers are:

- A)21 and 35
- B)30 and 50
- C)24 and 40
- D)18 and 30

Q4. The sum of the three numbers is 540. The ratio of second to third is 9 : 13 and that of first to third is 2 : 7. The third number is:

- A)273
- B)280

C)250

D)286

Q5. Three boxes of capacities 24 kg, 36 kg and 84 kg are filled with three varieties of wheat A, B and C respectively. All three boxes were emptied, the three types of wheat were thoroughly mixed, and the mixture was put back in the three boxes. How many kilograms of type A wheat would be in the third box (in kg)?

A)10 kg

B)12 kg

C)14 kg

D)16 kg

Q6..A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

A] 5

B] 7

C] 9

D] 7.2

Q7. An airplane covers a certain distance at a speed of 240 kmph in 5 hours to cover the same distance in $1\frac{2}{3}$ hours, it must travel at a speed of:

A] 300 kmph

B] 360 kmph

C] 400 km h

D] 720 kmph

Q8.To cover a certain distance at a speed of 60 km/h, a train takes 15 hours. If it covers the same distance in 12 hours, what will its speed be?

A] 9

B] 10

C] 5

D] 12

Q9. A can do work in 18 days. When he had work for 2 days, B joined him. If they complete the remaining work in 4 more days . In how many days B alone finishes the whole work?

A] 6 days.

B] 5 days.

C] 10 days.

D] 8 days.

Q10. There are two mixtures of honey and water, the quantity of honey in them being 25% and 75 % of the mixture. If 2 gallons of the first are mixed with three gallons of the second, what will be the ratio of honey to water in the new mixture?

A] 11 : 2

B] 11 : 9

C] 9 : 11

D] 2 : 11

ANSWER KEY

SET 1									
1	2	3	4	5	6	7	8	9	10
B	C	B	B	D	D	C	A	B	B
SET 2									
1	2	3	4	5	6	7	8	9	10
C	C	B	B	A	B	B	C	A	A
SET 3									
1	2	3	4	5	6	7	8	9	10
B	D	A	A	B	A	C	B	C	A
SET 4									
1	2	3	4	5	6	7	8	9	10
A	A	D	C	D	B	A	B	A	C
SET 5									
1	2	3	4	5	6	7	8	9	10
C	B	B	C	D	D	D	B	D	B
SET 6									
1	2	3	4	5	6	7	8	9	10
B	B	A	A	B	B	A	A	C	A
SET 7									
1	2	3	4	5	6	7	8	9	10
A	B	A	B	A	A	B	D	B	C
SET 8									

1	2	3	4	5	6	7	8	9	10
B	A	C	C	D	B	D	A	A	C
SET 9									
1	2	3	4	5	6	7	8	9	10
B	D	D	C	B	D	A	D	B	D
SET 10									
1	2	3	4	5	6	7	8	9	10
A	C	D	A	C	D	D	A	A	B

SOLUTIONS

SET - 1

1-B

Production of the D type of the cycle in 1998 = 105

Production of the D type of the cycle in 2000 = 125

Increase in production of the D type of the cycle from 1998 to 2000 = $125 - 105 = 20$

Percentage increase = $\frac{20 \times 100}{105} = 19.05\%$

The approximate percentage increase in production of the D type of the cycle from 1998 to 2000 is 19%.

Hence, the answer is 19%.

2-C

The average of 20 numbers = 35

The sum of 20 numbers = $20 \times 35 = 700$

Now add 85 and subtract 45,

Correct sum = $700 - 45 + 85 = 740$

\therefore Correct average = $\frac{740}{20} = 37$

Hence, the correct answer is 37.

3-B

Given: The diameter of a wheel on a bicycle is 21 cm. The cyclist takes 45 minutes to reach a destination at a speed of 16.5 km/h.

Here, $16.5 \text{ km/h} = \frac{16500}{60} \text{ m/min} = 275 \text{ m/min.}$

So, the total distance of the journey is = $(275 \times 45) = 12375 \text{ metres} = 1237500 \text{ cm.}$

Here, the diameter of a wheel on a bicycle is 21 cm \Rightarrow the radius is = $\frac{21}{2} \text{ cm.}$

$$\Rightarrow \text{the circumference of the wheel} = \left(2 \times \frac{22}{7} \times \frac{21}{2}\right) \text{ cm} = 66 \text{ cm}$$

4-B

Given: The diameter of a wheel on a bicycle is 21 cm. The cyclist takes 45 minutes to reach a destination at a speed of 16.5 km/h.

$$\text{Here, } 16.5 \text{ km/h} = \frac{16500}{60} \text{ m/min} = 275 \text{ m/min.}$$

So, the total distance of the journey is =
 $(275 \times 45) = 12375 \text{ metres} = 1237500 \text{ cm.}$

Here, the diameter of a wheel on a bicycle is 21 cm \Rightarrow the radius is = $\frac{21}{2} \text{ cm.}$

$$\Rightarrow \text{the circumference of the wheel} = \left(2 \times \frac{22}{7} \times \frac{21}{2}\right) \text{ cm} = 66 \text{ cm}$$

Therefore, during the journey, the wheel will make $\left(\frac{1237500}{66}\right) = 18750$ revolutions.
 Hence, the correct answer is 18750 revolutions.

5-D

Let the ages of boys be 3x years and 4x years, respectively.

According to the given condition:

After 3 years,

$$\frac{3x + 3}{4x + 3} = \frac{4}{5}$$

$$\Rightarrow 15x + 15 = 16x + 12$$

$$\Rightarrow x = 3$$

Therefore, the required ratio after 21 years is:

$$\frac{3 \times 3 + 21}{4 \times 3 + 21}$$

$$\frac{9 + 21}{12 + 21}$$

$$= \frac{30}{33}$$

$$= \frac{10}{11}$$

$$= \frac{10}{11}$$

Thus, the ratio of the age after 21 years is 10 : 11.
Hence, the correct answer is 10 : 11.

6-D

Let the ages of A and B be $4x$ and $3x$.

According to the question,

$$4x + 6 = 26$$

$$\Rightarrow 4x = 20$$

$$\Rightarrow x = 5$$

So, the age of B = $(3 \times 5) = 15$ years

Hence, the correct answer is 15 years.

7-C

Let the cost price (CP) be Rs. x .

Selling price (SP) of the bag = Rs. 230 and profit = 15%

$$SP = \frac{100 + \text{Profit \%}}{100} \times CP = Rs.230$$

$$\Rightarrow \frac{115x}{100} = Rs.230$$

$$\Rightarrow x = \frac{230}{115} \times 100$$

$$\Rightarrow x = Rs. 200$$

For a profit of 20%,

$$\text{The new selling price of the bag} = \frac{100 + 20}{100} \times 200 = \frac{120}{100} \times 200 = Rs.240$$

Thus, selling price = Rs. 240

Hence, the correct answer is Rs. 240.

8-A

Total number of students = 1400

$$\text{Number of students wearing spectacles} = 1400 \times \frac{25}{100} = 350$$

$$\text{Number of boys wearing spectacles} = 350 \times \frac{2}{7} = 100$$

Therefore, the number of girls wearing spectacles = $350 - 100 = 250$

Hence, the correct answer is 250.

9-B

Let the total number of students be x .

Boys = 60%

Girls = 40%

According to the question,

$$\frac{40x}{100} = 812$$

$$\Rightarrow x = 2030$$

The total number of students = 2030

Now, number of boys = (total students – number of girls) = 2030 – 812 = 1218

Hence, the correct answer is 1218.

10-B

Let the present age of R be $11x$ and S be $17x$.

According to the given condition,

$$\frac{11x - 11}{17x - 11} = \frac{11}{20}$$

$$\Rightarrow 220x - 220 = 187x - 121$$

$$\Rightarrow 33x = 99$$

$$\Rightarrow x = 3$$

Thus, the present age of R is $11 \times 3 = 33$ years

Hence, the correct answer is 33 years.

SET - 2

1-C

Average marks of 50 students = 70%

Total percentage of marks of 50 students = $5 \times 70\% = 3500\%$

Average of first 25 students = 60%

Total percentage of marks of 25 students = $25 \times 60\% = 1500\%$

Average marks of the next 24 students = 80%

Total percentage of marks of 24 students = $24 \times 80\% = 1920\%$

Percentage of Marks Obtained by the last student = $3500\% - (1500 + 1920)\% = 80\%$

Hence, the correct answer is 80%.

2-C

Passed in History = 65%

Failed in History = $(100 - 65) = 35\%$

Passed in Hindi = 55%

Failed in Hindi = $(100 - 55) = 45\%$

Failed in Both = 5%

So, the percentage of students who failed in a minimum of one subject = $(35 + 45) - 5 = 75\%$

Therefore, the percentage of those students who have passed both subjects = $(100 - 75) = 25\%$

Hence, the correct answer is 25%.

3-B

Let the maximum marks be 100%.

According to the question,

40% marks are equivalent to $(67 + 13) = 80$ marks

$$\frac{80 \times 100}{40} = 200 \text{ marks}$$

Now, 100% marks are equivalent to

So, the maximum marks = 200

Hence, the correct answer is 200.

4-B

Let their radii be x and $2x$ and their heights be h and H respectively

According to the question,

$$\frac{V_1}{V_2} = \frac{\frac{1}{3}\pi r_1^2 h_1}{\frac{1}{3}\pi r_2^2 h_2}$$

$$\text{or, } \frac{V_1}{V_2} = \frac{r_1^2 h_1}{r_2^2 h_2}$$

$$\text{or, } \frac{2}{3} = \frac{x^2 h}{(2x)^2 H}$$

$$\text{or, } \frac{2}{3} = \frac{x^2 h}{4x^2 H}$$

$$\text{or, } \frac{h}{H} = \frac{8}{3}$$

Hence, the answer is 8:3.

5-A

Given: Height of the vessel = 8 cm

Radius = 5 cm.

$$\text{Volume of the conical vessel} = \frac{1}{3}\pi r^2 h$$

$$\Rightarrow \frac{1}{3} \times \pi \times 5^2 \times 8$$

$$\Rightarrow \frac{200}{3} \pi \text{ cm}^3$$

$$\text{The volume of 25% of water} = \frac{1}{4} \times \frac{200}{3} \pi = \frac{50}{3} \pi \text{ cm}.$$

$$\text{The volume of the spherical metallic ball of the radius } R = \frac{4}{3}\pi R^3.$$

$$\Rightarrow \frac{4}{3} \times \pi \times \left(\frac{1}{2}\right)^3 = \frac{\pi}{6} \text{ cm}^3$$

$$\text{The number of balls required} = \frac{\frac{50}{3}\pi}{\frac{\pi}{6}}$$

$$= \frac{50}{3} \pi \times \frac{6}{\pi}$$

$$= 100$$

Hence, the correct answer is 100.

6-B

Bottle 1 has milk : water = 2 : 5

Bottle 2 has milk : water = 3 : 4

Bottle 3 has milk : water = 4 : 5

$$\text{Bottle 1 contains milk} = \frac{2}{7}, \text{ water} = \frac{5}{7}$$

$$\text{Bottle 2 contains milk} = \frac{3}{7}, \text{ water} = \frac{4}{7}$$

$$\text{Bottle 3 contains milk} = \frac{4}{9}, \text{ water} = \frac{5}{9}$$

When mixed, the ratio of milk and water is

$$\begin{aligned} & \left(\frac{2}{7} + \frac{3}{7} + \frac{4}{9}\right) : \left(\frac{5}{7} + \frac{4}{7} + \frac{5}{9}\right) \\ & = \left(\frac{18 + 27 + 28}{63}\right) : \left(\frac{45 + 36 + 35}{63}\right) = 73 : 116 \end{aligned}$$

Hence, the correct answer is 73 : 116.

7-B

The total quantity of the mixture is 25 litres.

Milk : Water = 4 : 1

$$\text{Milk} = \frac{4}{5} \times 25 = 20 \text{ litres}, \text{Water} = \frac{1}{5} \times 25 = 5 \text{ litres}$$

If 3 litres of water are added then the ratio becomes = 20 : (5 + 3) = 20 : 8 = 5 : 2

Hence, the correct answer is 5 : 2.

8-C

Let the cost price of the cycle be x.

$$SP \text{ when loss is } 10\% = \frac{100 - \text{Loss percentage}}{100} \times CP = \frac{90x}{100}$$

$$\text{Selling price when profit is } 6\% = \frac{100 + \text{Profit percentage}}{100} \times \text{Costprice} = \frac{106x}{100}$$

$$\text{Difference} = \frac{106x}{100} - \frac{90x}{100} = \frac{16x}{100}$$

$$\text{So, } \frac{16x}{100} = 200$$

$$\Rightarrow x = \frac{20000}{16}$$

$$\Rightarrow x = 1250$$

So, the cost price is Rs. 1250.

Hence, the correct answer is Rs. 1250.

9-A

Let the cost price of each article be Re. 1.

Selling price (SP) of 40 articles = Cost price (CP) of 50 articles = Rs. 50

CP of 40 articles = Rs. 40

Profit on 40 articles = SP of 40 articles – CP of 40 articles

$$\text{Profit}\% = \frac{\text{Profit}}{\text{CP}} \times 100$$

$$= \frac{10}{40} \times 100$$

= 25%

Hence, the correct answer is 25% gain.

10-A

Let the cost price (CP) be x .

The selling price of the tape recorder is Rs. 1040.

The selling price is equal to 104% of x .

$$\text{Selling price} = \frac{104x}{100} = \text{Rs.}1040$$

$$\text{Cost Price}(x) = \frac{1040 \times 100}{104} = \text{Rs.}1000$$

If it is sold for Rs. 950, there is a loss of Rs. 50.

$$\text{Loss}\% = \frac{\text{Loss}}{\text{CP}} \times 100\% = \frac{50}{1000} \times 100\% = 5\%$$

Hence, the correct answer is 5%.

SET - 3

1-B

Let the first number be $5x$, the second number be $7x$ and the third number be $12x$.

According to the question,

$$5x + 12x = 7x + 50$$

$$\Rightarrow 10x = 50$$

$$\Rightarrow x = 5$$

The required sum of the numbers is:

$$5x + 7x + 12x = 24x = 24 \times 5 = 120$$

Hence, the correct answer is 120.

2-D

The number 84 must be a multiple of the sum of the terms of the ratio.

By checking options

Option 1. The sum of 5 and 7 = 12 divides 84

Option 2. The sum of 13 and 8 = 21 divides 84

Option 3. The sum of 1 and 3 = 4 divides 84

Option 4. The sum of 3 and 2 = 5 does not divide 84

Hence, the correct answer is 3 : 2.

3-A

Given: The radius of a cylinder is increased by 25%.

Volume of the cylinder = $\pi r^2 h$

Let h be the initial height, r be the initial radius, H be the final height and the new radius

will be $\frac{125}{100}r = \frac{5}{4}r$.

According to the question,

$$\pi \times r^2 \times h = \pi \times \left(\frac{5}{4}r\right)^2 \times H$$

$$h = \frac{25}{16} \times H$$

$$\frac{h}{H} = \frac{25}{16}$$

The decrease in percentage in the height is $\frac{(h - H)}{h} \times 100$

$$\Rightarrow \frac{(25 - 16)}{25} \times 100$$

$$\Rightarrow 9 \times 4 = 36\%$$

Hence, the correct answer is 36.

4-A

Given: Height of the cone = 36 cm

Radius of base = 9 cm

Radius of cylinder = 9 cm

Height = 9 cm.

The volume of cone = $\frac{1}{3}\pi r^2 h$

$$\Rightarrow \frac{1}{3} \times \pi \times 9^2 \times 36 = 972\pi \text{ cm}^3$$

Volume of cylinder = $\pi r^2 h$.

$$\Rightarrow \pi \times 9^2 \times 9 = 729\pi \text{ cm}^3$$

The volume of waste = volume of cone – volume of cylinder

$$\Rightarrow 972\pi - 729\pi = 243\pi$$

$$\begin{aligned} \text{The material wasted} &= \frac{\text{volume of cone} - \text{volume of cylinder}}{\text{volume of cone}} \\ &= \frac{243\pi}{972\pi} \times 100 = 25\% \end{aligned}$$

Hence, the correct answer is 25%.

5-B

Let the initial price be x .

$$\text{Increment in price is 20\%, means increased price} \Rightarrow \frac{120x}{100} = \frac{6x}{5}$$

According to the question,

Initial quantity – current quantity = reduction in quantity

$$\Rightarrow \frac{50}{x} - \frac{50}{\frac{6x}{5}} = 2$$

$$\Rightarrow \frac{50}{x} - \frac{250}{6x} = 2$$

$$\Rightarrow \frac{300 - 250}{6x} = 2$$

$$\Rightarrow x = \frac{50}{12}$$

$$\text{Initial quantity} = \frac{50}{\left(\frac{50}{12}\right)} = 12\text{kg}$$

Hence, the correct answer is 12 kg.

6-A

Let the initial price be x .

$$\text{Increment in price is 20\%, means increased price} \Rightarrow \frac{120x}{100} = \frac{6x}{5}$$

According to the question,

Initial quantity – current quantity = reduction in quantity

$$\Rightarrow \frac{120}{x} - \frac{120}{\frac{6x}{5}} = 4$$

$$\Rightarrow \frac{120}{x} - \frac{600}{6x} = 4$$

$$\Rightarrow \frac{120}{x} - \frac{100}{x} = 4$$

$$\Rightarrow \frac{20}{x} = 4$$

$$\Rightarrow x = 5$$

The initial price per kg of sugar was Rs. 5 per kg

Hence, the correct answer is Rs. 5 per kg.

7-C

Change in price = $(80 - 60) = 20\%$

The base price of that year = 80%

$$\text{Required Percentage} = \frac{20}{80} \times 100 = 25\%$$

Hence, the correct answer is 25% .

8-B

Score s	Frequencies	Mid Point	Mid Point x Frequencies
0-10	2	5	10
10-20	4	15	60
20-30	12	25	300
30-40	21	35	735
40-50	6	45	270
50-60	3	55	165
60-70	2	65	130

$$\text{Mean} = \frac{\sum (\text{Mid Point} \times \text{Frequencies})}{\sum \text{Mid Point}}$$

$$\text{Mean} = \frac{10 + 60 + 300 + 735 + 270 + 165 + 130}{2 + 4 + 12 + 21 + 6 + 3 + 65}$$

$$\text{Mean} = \frac{1670}{50}$$

Mean = 33.4

Hence, the answer is 33.4.

9-C

The radius of the incircle of an equilateral triangle is given by the formula = $\frac{a}{2\sqrt{3}}$ where a is the side length of the triangle.

Given that the length of the sides of the equilateral triangle ABC is $2\sqrt{3}$ cm.

$$x = \frac{2\sqrt{3}}{2\sqrt{3}} = 1$$

Hence, the value of X is 1 cm.

10-A

In parallelogram ABCD,

The formula of diagonals is

$$AC^2 + BD^2 = 2(AB^2 + BC^2)$$

$$\Rightarrow 8^2 + BD^2 = 2(7^2 + 9^2)$$

$$\Rightarrow 64 + BD^2 = 2(49 + 81) = 260$$

$$\Rightarrow BD^2 = 260 - 64 = 196$$

$$\Rightarrow BD = 14 \text{ cm}$$

Hence, the length of the other diagonal is 14 cm.

SET - 4

1-A

$$\text{Profit \%} = \left(\frac{4}{8}\right) \times 100 = 50\%$$

2-A

Let MP = 100

CP = 70

S = $70 \times 1.25 = 87.5$

Now 87.5 % = 8750

MP = 100% = 10000

3-D

$78^{193}/97$

$78^1/97=78$

4-C

S.I = $(2000 \times 2 \times 10) / 100 = 4000$

Or S.I = RT% of P = $10 \times 2 \%P$ of P i.e 20 % of
 $= 20/100 \times 20000 = 4000.$

5-D

I = A-P

$= 2500 - 2000 = 500$

$500 / 2000 \times 100 = 25 \%$

Interest for 2 years = 25 %

Interest for 1 years = $25\% / 2 = 12.5 \%$

6-B

Due to stoppages, it covers 9 km less.

Time taken to cover $9 \text{ km} = \left(\frac{9}{54} \times 60 \right) \text{ min} = 10 \text{ min}.$

7-A

Let the duration of the flight be x hours.

$$\text{Then, } \frac{600}{x} - \frac{600}{x + (1/2)} = 200$$

$$\Rightarrow \frac{600}{x} - \frac{1200}{2x + 1} = 200$$

$$\Rightarrow x(2x + 1) = 3$$

$$\Rightarrow 2x^2 + x - 3 = 0$$

$$\Rightarrow (2x + 3)(x - 1) = 0$$

$$\Rightarrow x = 1 \text{ hr. [neglecting the -ve value of } x]$$

8-B

Given: Speed of boat is 30 km/hr and 60 km/hr for same distance.

So, Average speed = $\frac{2xy}{x+y}$ (for same distance)

Putting the values $x = 30$ and $y = 60$

$$\text{Average speed} = \frac{2 \times 30 \times 60}{30 + 60} \Rightarrow \frac{3600}{90}$$

Average speed = 40

9-A

Since X takes 20 days working 7 hours a day to complete the work, the number of day-hours required to complete this work would be 140 day-hours. Like in the two problems above, this is going to be constant throughout. So, $W = 140$ day-hours.

Amount of work done in the 1st day by X = 1 day \times 4 hours = 4 day-hours

2nd day, X does again 4 day-hours of work. The second person is twice as efficient as X so he will do 8 day-hours of work. Total work done on the second day = $8 + 4 = 12$ day-hours. Amount of work completed after two days = $12 + 4 = 16$ day-hours.

3rd day, X does 4 day-hours of work. Second Person does 8 day-hours of work. Third person who is thrice as efficient as X does 12 day-hours of work. Total work done on 3rd day = $4 + 8 + 12 = 24$ day-hours Amount of work completed after 3 days = $16 + 24 = 40$ day-hours

Similarly on 4th day the amount of work done would be $4 + 8 + 12 + 16 = 40$ day-hours

Work done on the 5th day = $4 + 8 + 12 + 16 + 20 = 60$ day-hours

Total work done after 5 days = $4 + 12 + 24 + 40 + 60 = 140$ day-hours = W . So it takes 5 days to complete the work.

10-C

$$\begin{array}{ccc}
 & 62 & \\
 & / \quad \backslash & \\
 18 & & 12
 \end{array}
 \quad = 3:2$$

$$\frac{3x}{2x+6} = \frac{1}{1} = 3x = 2x+6$$

$$x = 6$$

Quantity of 80 % solution = $6 \times 2 = 12$ L

SET - 5

1-C

$$2 : 5 = 120$$

$$2x : 5x = 120$$

$$10x = 120$$

$$x = 12$$

Second number is 60

2-B

Required sum = P.W. of Rs. 702 due 6 months + P.W. of Rs. 702 due 1 year hence

$$= \text{Rs.} \left[\left(\frac{100 \times 702}{100 + 8 \times \frac{1}{2}} \right) + \left(\frac{100 \times 702}{100 + (8 \times 1)} \right) \right]$$

$$= \text{Rs.} (675 + 650)$$

$$= \text{Rs.} 1325.$$

3-B

We know that, in a deck,

Total no. of cards = 52

No. of kings = 4

No. of heart cards = 13

& total no. of red cards = $13 + 13 = 26$

Thus, favorable outcomes = $4 + 13 + 26 - 13 - 2$

$$= 28$$

Now,

Probability = no. of favorable outcomes / total no. of outcomes

$$= 28 / 52$$

$$= 7/13$$

4-C

$$3^{1002}/33$$

$$3^{10 \cdot 100 + 1} / 11 = 3$$

$$3 \cdot 3 = 9$$

5-D

$$100!/101$$

$$(p-1)!/p = (p-1) \quad (p = \text{prime number})$$

6-D

$$45!^{450}$$

$$45/5 = 9$$

$$9+1 = 10$$

$$(10 \text{ zeros})^{450}$$

$$10 \cdot 450 = 4500$$

7-D

$$31! \cdot 42! \cdot 100!$$

$$7+9+24 = 40$$

8-B

Product of numbers = $29 \cdot 4147$.

Let the numbers be $29a$ and $29b$.

$$\text{Then, } 29a \cdot 29b = (29 \cdot 4147)$$

$$\Rightarrow ab = 143.$$

Now, co-primes with product 143 are (1, 143) and (11, 13).

So, the numbers are $(29 \cdot 1, 29 \cdot 143)$ and $(29 \cdot 11, 29 \cdot 13)$.

Since both numbers are greater than 29, the suitable pair is $(29 \cdot 11, 29 \cdot 13)$

i.e., (319, 377).

Required sum = (319 + 377) = 696.

9-D

$24960 = \text{initial} \times (104/100) \times (96/100)$

Initial population = 25000

10-B

Absent students = (100-97)% = 18

3% = 18

100% = 600

SET - 6

1-B

$684 \times 759 \times 413 \times 676$

$4 \times 9 \times 3 \times 6 = 648$

Last digit = 8

2-B

B is the difference B/w 2 years of interest So B = 160

Difference B/w 3 years of C.I and S.I

= $3B + C = 488$

$160 \times 3 + C = 8$

C is calculated on 8

= rate = $8 / 160 \times 100 = 5\%$

$A = 160 / 5 \times 100 = 3200$

$P = 3200 / 5 \times 100$

P = 64000 Rs.

3-A

Difference B/W C.I and S.I = $P (r/100)^2$

$126.72 = p (12/100)^2$

P = 8800

4-A

Let the actual distance traveled be x km.

Then,

$$\frac{x}{10} = \frac{x + 20}{14}$$

$$\Rightarrow 14x = 10x + 200$$

$$\Rightarrow 4x = 200$$

$$\Rightarrow x = 50 \text{ km.}$$

5-B

Let the speed of the car be x kmph.

$$\text{Then, speed of the train} = \frac{150}{100}x = \left(\frac{3}{2}x\right) \text{ kmph.}$$

$$\therefore \frac{75}{x} - \frac{75}{(3/2)x} = \frac{125}{10 \times 60}$$

$$\Rightarrow \frac{75}{x} - \frac{50}{x} = \frac{5}{24}$$

$$\Rightarrow x = \left(\frac{25 \times 24}{5}\right) = 120 \text{ kmph.}$$

6-B

Given: Speed of boat is 30 km/hr and 60 km/hr for same distance.

So, Average speed = $\frac{2xy}{x+y}$ (for same distance)

Putting the values $x = 30$ and $y = 60$

$$\text{Average speed} = \frac{2 \times 30 \times 60}{30 + 60} \Rightarrow \frac{3600}{90}$$

$$\text{Average speed} = 40$$

7-A

Ram completes 60% of the task in 15 days.

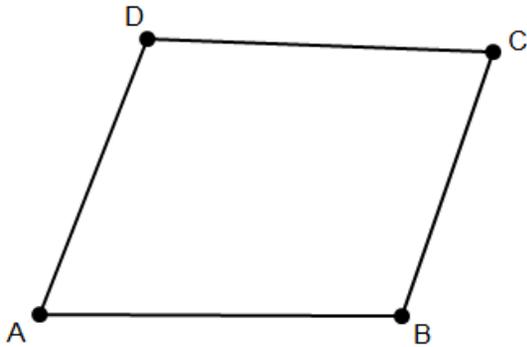
i.e., he completes 4% of the task in a day.

Rahim is 50% as efficient as Ram is.

Therefore, Rahim will complete 2% of the task in a day.

10-A

From the concept, the opposite side of a parallelogram is equal.



Let ABCD is parallelogram, $AB = 10$ cm and AB and BC are adjacent side

$AB = CD$ and $AD = BC$ (opposite sides)

$$AB + BC + CD + DA = 50$$

$$10 + BC + 10 + DA = 50$$

$$BC + DA + 20 = 30$$

$$BC = 15$$

$$BC = DA = 15 \text{ cm}$$

SET - 7

1-A

$$SP = 720$$

$$\text{New SP} = 510$$

$$\text{Difference} = 720 - 510$$

$$\text{Now } P : L = 1 : 2$$

$$P = 200 \times \left(\frac{1}{3}\right) = 700$$

$$\text{Then } CP = 720 - 70 = 650$$

2-B

$$CP = 600$$

$$SP = 600 \times 1.20 = 720$$

$$.9 \times MP = 720$$

$$MP = 800$$

3-A

$$47^{100}/100$$

$$= (-1+10)^{50}$$

$$\diamond 1-500=-499$$

$$\diamond -499+1000=501$$

$$\diamond 1$$

4-B

for this take 100 as principal

R = 10 % and half yearly rate will be 5 %

$$5+5+0.25 = 10.25$$

5-A

Here, $P = \text{R } 8000$, $R = 4\%$, Time = 2 years

Now, according to the formula,

$$\text{Amount} = P\left(1 + \frac{R}{100}\right)^n = 8000 \left(1 + \frac{4}{100}\right)^2 = 8000 \times \frac{26}{25} \times \frac{26}{25} = \text{R } 8652.80$$

$$\therefore \text{CI} = \text{R } (8652.80 - 8000) = \text{R } 652.80$$

6-A

Let Abhay's speed be x km/hr.

$$\text{Then, } \frac{30}{x} - \frac{30}{2x} = 3$$

$$\Rightarrow 6x = 30$$

$$\Rightarrow x = 5 \text{ km/hr.}$$

7-B

Let the distance traveled by x km.

$$\text{Then, } \frac{x}{10} - \frac{x}{15} = 2$$

$$\Rightarrow 3x - 2x = 60$$

$$\Rightarrow x = 60 \text{ km.}$$

$$\text{Time taken to travel } 60 \text{ km at } 10 \text{ km/hr} = \left(\frac{60}{10}\right) \text{ hrs} = 6 \text{ hrs.}$$

So, Robert started 6 hours before 2 P.M. i.e., at 8 A.M.

$$\therefore \text{Required speed} = \left(\frac{60}{5}\right) \text{ kmph.} = 12 \text{ kmph.}$$

8-D

Man's rate in still water = $(15 - 2.5) \text{ km/hr} = 12.5 \text{ km/hr.}$

Man's rate against the current = $(12.5 - 2.5) \text{ km/hr} = 10 \text{ km/hr.}$

9-B

$$\text{A's 2 day's work} = \left(\frac{1}{20} \times 2\right) = \frac{1}{10}.$$

$$\text{(A+B+C)'s 1 day's work} = \left(\frac{1}{20} + \frac{1}{30} + \frac{1}{60}\right) = \frac{6}{60} = \frac{1}{10}.$$

$$\text{Work done in 3 days} = \left(\frac{1}{10} + \frac{1}{10}\right) = \frac{1}{5}.$$

Now, $\frac{1}{5}$ work is done in 3 days.

\therefore Whole work will be done in $(3 \times 5) = 15$ days.

10-C

Let the capacity of each = 100 ml

So 300 ml removed and poured into second

First vessel = 200 ml alcohol

Second = 500 ml water+ 300 ml A

Ratio = 5:3

Proportion of alcohol = $\frac{3}{8}$

If 300 ml removed from second = $300 \times \frac{5}{8} = 187.5$ ml water

= 112.5 ml alcohol

Now poured so vessel = $200 + 112.5 = 312.5$ A

= 187.5 ml

Hence ratio = 5:3 proportion of water = $\frac{3}{8}$

So A= B

SET - 8

1-B

$$\text{Diff} = 1920 - 1280 = 640$$

CP lies b/w both SP's

$$\text{CP} = 1280 + \frac{640}{2} = 1600$$

$$\text{New SP} = 1600 \times 1.25 = 2000$$

2-A

$$P\% = \left(\frac{\text{diff}}{\text{SP}} \right) \times 100$$

$$25 = \left(\frac{(20 - x)}{x} \right) \times 100$$

$$x = 16$$

3-C

$$(1!+2!+3!+\dots+4000!)/7$$

$$(1+2-1+3+1+6)/7 = 5$$

4-C

$$A = 3000$$

$$T = 5 \text{ years}$$

$$R = 10\%$$

Interest for 5 years at 10 % rate is equal to the 50 % of P and amount will be 150 % of P
3000 is 150 %

$$3000/150 \times 100 = 2000$$

i.e 100 % is equal to the P which is 2000 Rs .

5-D

Amount after 4 years = 2480 Rs.

Amount after 8 years = 4080 Rs.

Difference = 1600

Because interest is S.I , so it is equal for every year

$$P = A - I$$

$$2480 - 1600 = 880$$

6-B

$$\frac{(1/2)x}{21} + \frac{(1/2)x}{24} = 10$$

$$\Rightarrow \frac{x}{21} + \frac{x}{24} = 20$$

$$\Rightarrow 15x = 168 \times 20$$

$$\Rightarrow x = \left(\frac{168 \times 20}{15} \right) = 224 \text{ km.}$$

7-D

Let the speed of two trains be $7x$ and $8x$ km/hr.

$$\text{Then, } 8x = \left(\frac{400}{4} \right) = 100$$

$$\Rightarrow x = \left(\frac{100}{8} \right) = 12.5$$

\therefore Speed of first train = (7×12.5) km/hr = 87.5 km/hr.

8-A

Given: Speed of train is 116 km/h.

$$\Rightarrow \left(116 \times \frac{5}{18} \right) = \frac{580}{18} \text{ m/s.}$$

The distance covered in 18 Sec. = speed \times time

$$\Rightarrow \frac{580}{18} \times 18 = 580 \text{ meter}$$

9-A

Amount of work P can do in 1 day = $1/20$

Amount of work Q can do in 1 day = $1/30$

Amount of work R can do in 1 day = $1/60$

P is working alone and every third day Q and R is helping him

Work completed in every three days = $2 \times (1/20) + (1/20 + 1/30 + 1/60) = 1/5$

So work completed in 15 days = $5 \times 1/5 = 1$

hence, the work will be done in 15 days

10-C

Part filled by (A+B) in 1 minute = $\left(\frac{1}{60} + \frac{1}{40}\right) = \frac{1}{24}$.

Suppose the tank is filled in x minutes.

$$\text{Then, } \frac{x}{2} \left(\frac{1}{24} + \frac{1}{40}\right) = 1$$

$$\Rightarrow \frac{x}{2} \times \frac{1}{15} = 1$$

$$\Rightarrow x = 30 \text{ min}$$

SET - 9

1-B

We have $\angle A = \angle C = 60^\circ$ (opposite angle of parallelogram are equal)

Let, $\angle CDB = x$

In triangle CDB we have

$CD = BC$ (side of rhombus are equal)

So, $\angle CDB = \angle DBC = x$

therefore, $\angle CDB + \angle DBC + 60^\circ = 180^\circ$

$$2x = 120^\circ$$

$$x = 60^\circ$$

$$\angle CDB = 60^\circ$$

2-D

Let salaries be $4x$ & $7x$

So, $(4x + 25)/(7x + 25) = 3/5$

$$\Rightarrow x = 50$$

$$4 \times 50 : 7 \times 50$$

$$200 : 350$$

$$4 : 7$$

3-D

P.W. = Rs. $(1760 - 160) =$ Rs. 1600. \therefore S.I. on Rs. 1600 at 12% is Rs. 160. \therefore

$$\text{Time} = \left(\frac{100 \times 160}{1600 \times 12} \right) = \frac{5}{6} \text{ years} = \left(\frac{5}{6} \times 12 \right) \text{ months} = 10 \text{ months.}$$

4-C

$$P(\text{Sum } 6) = \frac{5}{36}$$

$$(1, 5), (5, 1), (2, 4), (4, 2), (3, 3)$$

$$P(\text{Sum } 7) = \frac{6}{36} = \frac{1}{6}$$

$$(1, 6), (6, 1), (2, 5), (5, 2), (3, 4), (4, 3)$$

If A represents total of 6 for A, A' represents total which is other than 6, B represents total of 7 for B, and B' represents when it is not 7

A wins when A, A'B'A, A'B'A'B'A,

$$\begin{aligned} \therefore P(\text{A wins}) &= \frac{5}{36} + \frac{31}{36} \times \frac{5}{6} \times \frac{5}{36} + \frac{31}{36} \times \frac{5}{6} \times \frac{31}{36} \times \frac{5}{6} \times \frac{5}{36} + \dots \\ &= \frac{\frac{5}{36}}{1 - \frac{31}{36} \times \frac{5}{6}} = \frac{30}{61} \end{aligned}$$

5-B

$$97 - 7 = 90, \quad 65 - 5 = 60$$

$$\text{HCF of } 90 \text{ and } 60 = 30$$

6-D

$$\text{HCF of } (37 - 23), (79 - 37), (79 - 23)$$

HCF of 14,42 and 56= 14

7-A

4 223

5 55 3
6 11 0
1 5

Remainder= 5

8-D

$5^6 - 5^2$

- ⇒ ---00-25
- ⇒ ---00
- ⇒ Divisible by 100

9-B

Value and Zero of a Polynomial -

If $p(x)$ is a polynomial in x , and if k is any real number, then the value obtained by replacing x by k in $p(x)$, is called the value of $p(x)$ at $x = k$, and is denoted by $p(k)$.

So, If $p(x)$ is a polynomial in the form of : $a_0 + a_1x + a_2x^2 + a_3x^3 + \dots + a_nx^n$ with $a_n \neq 0$, then value of the polynomial $p(x)$ for a real value at $x=k$ will be given by $p(k) = a_0 + a_1 \times (k) + a_2 \times (k)^2 + a_3 \times (k)^3 + \dots + a_n \times (k)^n$.

For example, consider the polynomial $p(x) = x^2 - 3x - 4$. Then the value of $p(2)$ will be -6. (How?)

Value is obtained by replacing x by 2 in the expression $x^2 - 3x - 4$,

Another example:

Let $p(x) = 2x^2 - 3x + 5$. Then,

$$p(2) = \{2 \times 2^2 - 3 \times 2 + 5\} = (8 - 6 + 5) = 7$$

$$p(-1) = \{2 \times (-1)^2 - 3 \times (-1) + 5\} = (2 + 3 + 5) = 10$$

-

$$p(2) = 2 \times 2 - 2 \times 2 - 3 = -3$$

10-D

LCM of 8,11,24=264

$$\text{Number} = 264 \cdot a + 5$$

$$A = 37 + 1 = 38$$

$$\text{Number} = 264 \cdot 38 + 5 = 10037$$

SET - 10**1-A**

Let the cost price of the article be Rs. x .

According to the given conditions:

$$\Rightarrow 78 - x = 2(69 - x)$$

$$\Rightarrow 78 - x = 138 - 2x$$

$$\Rightarrow x = 60$$

Hence, the correct answer is Rs. 60.

2-C

Let the cost price be Rs. x .

$$\text{Profit} = \text{Selling price} - \text{Cost price} = 524 - x$$

$$\text{Loss} = \text{Cost price} - \text{Selling price} = x - 452$$

According to the question,

$$524 - x = x - 452$$

$$\Rightarrow 2x = 976$$

$$\Rightarrow x = 488$$

Hence, the correct answer is Rs. 488.

3-D

Let the numbers be $3x$ and $6x$.

According to the question,

$$\frac{3x + 6}{5x + 6} = \frac{2}{3}$$

$$\Rightarrow 9x + 18 = 10x + 12$$

$$\Rightarrow x = 6$$

Therefore, the numbers are $(3 \times 6) = 18$ and $(5 \times 6) = 30$

Hence, the correct answer is 18 and 30.

4-A

Let the ratio of 2nd : 3rd = 9 : 13

And the ratio of 1st : 3rd = 2 : 7

3rd number is common in both ratio, so to make the value equal, we need to multiply by 7 in 9 : 13 and by 13 in 2 : 7.

We get, 1st : 2nd : 3rd = 26 : 63 : 91

Let the 1st, 2nd and 3rd number be 26x, 63x and 91x.

According to the question,

$$26x + 63x + 91x = 540$$

$$\Rightarrow 180x = 540$$

$$\Rightarrow x = 3$$

Thus, the 3rd number be (91 \times 3) = 273

Hence, the correct answer is 273.

5-C

The mixture of A, B and C, according to the capacities of the boxes they were in, is in a ratio of 24 : 36 : 84 = 2 : 3 : 7

$$\text{Part of A is } \frac{2}{2+3+7} = \frac{2}{12}$$

According to the capacity of the third box, the amount of type A wheat in the third box

$$= \frac{2}{12} \times 84 = 14 \text{ kg}$$

Hence, the correct answer is 14 kg.

6-D

Speed = 2 m/sec.

$$\text{Converting m/sec to km/hr} = 2 \times \frac{18}{5} = 7.2 \text{ km/hr.}$$

7-D

Distance = (240 x 5) = 1200 km.

Speed = 1200/(5/3) km/hr.

$$\therefore \text{ Requierd Speed} = 1200 \times \frac{18}{5} = 720 \text{ km/hr}$$

8-A

Let the speed of boat in still water be a km/hour and speed of water be b km/hour.

As per first given condition:

$$\Rightarrow \frac{4}{(a-b)} + \frac{4}{(a+b)} = 1$$

Let $\frac{1}{(a-b)} = x$ and $\frac{1}{(a+b)} = y$

$$\Rightarrow 4x + 4y = 1$$

$$\Rightarrow x + y = \frac{1}{4} \text{ ----(1)}$$

As per second given condition:

$$\Rightarrow \frac{3}{(a-b)} + \frac{5}{(a+b)} = \frac{55}{60}$$

$$\Rightarrow 3x + 5y = \frac{11}{12}$$

By putting the value of y from equation (1) we get:

$$\Rightarrow 3x + 5\left(\frac{1}{4} - x\right) = \frac{11}{12}$$

$$\Rightarrow 2x = \frac{5}{4} - \frac{11}{12}$$

$$\Rightarrow x = \frac{1}{6} \Rightarrow (a-b) = 6 \text{ ----(2)}$$

By putting the value of x in equation (1)

$$\Rightarrow y = \frac{1}{4} - \frac{1}{6}$$

$$\Rightarrow y = \frac{1}{12} \Rightarrow (a+b) = 12 \text{ ----(3)}$$

From equation 2 and 3,

$$\Rightarrow 2a = 18 \Rightarrow a = 9$$

So, the speed of boat in still water is 9.

9-A

work done by A in 1 day = $1/18$

Number of days A work = $2+4=6$ therefore, total work done by A = $6 \times 1/18 = 1/3$

The remaining $2/3$ work is done by B in 4 days and hence complete work done by B will be

$$4 \times (3/2) = 6 \text{ days.}$$

10-B

H: W

H: W

1: 3

3: 1



2 gallon



3 gallon

$1/2, 3/2$

$9/4, 3/4$

Ratio = $1/2 + 9/4: 3/2 + 3/4$

$11/4: 9/4$

11:9

OTHER USEFUL RESOURCES

MH CET Law (5-Years LLB) 10 Free Mock Test

The “MH CET Law (5Year LLB) 10 Free Mock Tests PDF” is available for download by students enrolled in the 5-year programme. It would be very helpful in helping them get high scores in exams. This eBook includes 10 sets of mock tests to help you ace the test in addition to covering subject-wise analysis, exam format, pattern, and preparation techniques.

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ABOUT THIS eBook

Explore the world of Maths with our special ebook designed for MH CET Law aspirants.

What's in the ebook?

In this ebook, we provided 10 sets of practice questions on diverse topics that can be asked in the MH CET Law exam.

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Each test has 10 carefully crafted questions that stimulate the exam conditions. This helps you get used to the types of questions you might face.

In addition, we provide an answer key and detailed solutions. It's not just about getting the right answer – we show you step-by-step how to solve problems, boosting your confidence for the real exam.

Furthermore, Our ebook goes the extra mile by being a one-stop resource.

It includes the MH CET Law GK and Legal Reasoning Practice Questions PDF along with the MH CET Law (3 and 5-year) Law Programs 10 Free Mock Tests. You can easily find them on the "**Other Useful Resources**" page.

Embrace your preparation with confidence and set yourself on the path to success.

BRIEF INTRODUCTION TO MATHS

Mathematics is divided into three parts which are Algebra, Arithmetic and Geometry. They are all branches of mathematics, each with its distinct focus and methods. Here's a brief elaboration on the differences between them:

Algebra			
Algebra deals with symbols and the rules for manipulating these symbols to solve equations and analyze mathematical relationships.	It involves the study of mathematical operations such as addition, subtraction, multiplication, division, exponentiation, and root extraction, but in a generalized form using variables and symbols rather than specific numbers.	Algebra includes equations, inequalities, polynomials, functions, matrices, and complex numbers.	It is beneficial for solving problems involving unknown quantities and understanding patterns and structures in mathematical systems.
Arithmetic			
Arithmetic is the most elementary branch of mathematics, focusing on basic operations and properties of numbers.	It involves the study of addition, subtraction, multiplication, division, and their properties, typically using concrete numerical values rather than abstract symbols.	Arithmetic deals primarily with numerical computations and elementary mathematical operations involving real numbers, fractions, decimals, and integers.	It is fundamental for everyday calculations, financial transactions, and basic problem-solving situations.
Geometry			
Geometry is the branch of mathematics concerned with the properties, measurement, and relationships of points, lines, angles, surfaces, and solids.	It studies spatial relationships and shapes, including properties such as length, area, volume, angles, and curvature.	Geometry encompasses various topics, including Euclidean geometry (the study of shapes and figures in two and three dimensions), analytic geometry (using algebraic methods to study	It has applications in diverse fields such as architecture, engineering, physics, computer graphics, and astronomy.

		geometric concepts), differential geometry (dealing with curves and surfaces using calculus), and topology (the study of spatial properties unaffected by continuous deformations).	
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In conclusion, algebra focuses on symbolic manipulation and relationships between variables, whereas, arithmetic deals with basic numerical operations and properties of numbers, and geometry studies the properties and relationships of shapes and spatial configurations. Each branch has its own set of concepts, techniques, and applications, but they are interconnected and often used together to solve complex mathematical problems.

FEW TIPS AND TRICKS TO IMPROVE YOUR MATHEMATICAL SKILLS



Emphasize Practice:

Achieving proficiency in math requires more than just reading or listening. Actively engage in problem-solving to enhance your skills. The more problems you solve, the better equipped you'll be. Practice different problem-solving approaches to build versatility.

Learn from Mistakes:

When practicing, thoroughly analyze your solutions, especially if you make mistakes. Understand the shortcomings in your problem-solving approach. Identifying errors helps strengthen your skills and prevents repeating the same mistakes.



Grasp Key Concepts:

Avoid memorizing processes; instead, focus on understanding the underlying logic. Mathematics builds on sequential concepts, so ensure a solid grasp of fundamental principles before tackling more complex problems. Understanding the "why" is crucial for long-term success.

Address Doubts:

When stuck on a part of a problem, resist the urge to skip it. Take the time to comprehend the solution process. Once you understand the initial problem, use it as a foundation to progress through the entire question. Math mastery requires time, patience, and a willingness to confront challenges.



Optimize Your Study Environment:

Create a distraction-free study environment for math, a subject demanding high concentration. Background music, chosen carefully for a relaxing atmosphere, can aid focus. Eliminate distractions to enhance your ability to solve complex problems in geometry, algebra, or trigonometry.

Build a Mathematical Dictionary:

Compile notes, flashcards, or cheat sheets containing essential math concepts, terminology, and definitions. Include meanings, key points, and sample answers for quick reference. This resource will serve as a handy tool for reviewing and reinforcing your understanding.

**Apply Math to Real-World Problems:**

Relate mathematical concepts to real-world scenarios to make them more tangible. Applying math to practical situations can alter your perspective and enhance comprehension. For instance, use probability to assess risks in everyday decisions, such as buying a lottery ticket.

Remember to approach exams with confidence, knowing you've prepared thoroughly. Collaborating with a study partner can also be beneficial for discussing and solving complex problems.

Let's begin with the Study Material.

SET - 1

Q1. Directions: Study the table and answer the question. The number of five types of cycles manufactured by a company over the years is given below:

Year s	Types of cycles (in 1000)				
	A	B	C	D	E
1997	200	150	78	90	65
1998	150	180	100	105	70
1999	180	175	92	110	85
2000	195	160	120	125	75
2001	220	185	130	135	80

What was the approximate percentage increase in production of the D type of the cycle from 1998 to 2000?

- A)10
- B)19
- C)15
- D)17

Q2. The average of 20 numbers is calculated as 35. It is discovered later on that while calculating the average, one number, 85, was misread as 45. The correct average is:

- A)36
- B)36.5
- C)37

D)37.5

Q3. The diameter of a wheel on a bicycle is 21 cm. The cyclist takes 45 minutes to reach a destination at a speed of 16.5 km/h. How many revolutions will the wheel make during the journey?

A)12325

B)18750

C)21000

D)24350

Therefore, during the journey, the wheel will make $\left(\frac{1237500}{66}\right) = 18750$ revolutions.
Hence, the correct answer is 18750 revolutions.

Q4. The diameter of a wheel on a bicycle is 21 cm. The cyclist takes 45 minutes to reach a destination at a speed of 16.5 km/h. How many revolutions will the wheel make during the journey?

A)12325

B)18750

C)21000

D)24350

Q5. The ratio of the present ages of the two boys is 3:4. After 3 years, the ratio of their ages will be 4:5. The ratio of their ages after 21 years will be:

A)14 : 17

B)17 : 19

C)11 : 12

D)10 : 11

Q6. The ratio of A's age to B's age is 4 : 3. A will be 26 years old after 6 years. The age of B now is:

A) $19\frac{1}{2}$ years

B) 12 years

C) 21 years

D) 15 years

Q7. By selling a bag for Rs. 230, a profit of 15% is made. The selling price of the bag, when sold at 20% profit, would be:

A) Rs. 250

B) Rs. 205

C) Rs. 240

D) Rs. 200

Q8. There are 1400 students in a school, 25% of them wear spectacles and $\frac{2}{7}$ th of those wearing spectacles are boys. How many girls in the school wear spectacles?

A) 250

B) 100

C) 200

D) 300

Q9. If 60% of the students in a school are boys and the number of girls is 812, how many boys are there in the school?

A) 1128

B) 1218

C) 1821

D) 1281

Q10. The ratio of the present ages of R and S is 11 : 17. 11 years ago, the ratio of their ages was 11 : 20. What is R's present age (in years)?

A)51

B)33

C)22

D)40

CAREERS360

SET - 2

Q1 The average mark obtained in a class of 50 students is 70%. The average of the first 25 is 60% and that of 24 is 80%. What were the marks obtained by the last student?

- A)90%
- B)60%
- C)80%
- D)70%

Q2. In an examination, 65% of students pass in History and 55% pass in Hindi. If 5% of students fail in both subjects, then what is the percentage of students who have passed in both subjects?

- A)15
- B)20
- C)25
- D)30

Q3. A student has to score 40% to pass. He gets 67 and fails by 13 marks. What are the maximum marks?

- A)300
- B)200
- C)150
- D)240

Q4. The ratio of the volume of two cones is 2:3, and the ratio of the radii of their bases is 1:2. The ratio of their heights is:

- A)3:8

B)8:3

C)4:3

D)3:4

Q5. An inverted conical– shaped vessel is filled with water to its brim. The height of the vessel is 8 cm and the radius of the open end is 5 cm. When a few solid spherical metallic balls each of radius $\frac{1}{2}$ cm are dropped in the vessel, 25% water is overflowed. The number of balls is:

A)100

B)400

C)200

D)150

Q6. Three bottles of equal capacity contain mixtures of milk and water in ratios 2 : 5, 3 : 4 and 4 : 5 respectively. These three bottles are emptied into a large bottle. What will be the ratio of milk and water respectively in the large bottle?

A)73 : 106

B)73 : 116

C)73 : 113

D)73 : 189

Q7. In a mixture of 25 litres, the ratio of milk to water is 4 : 1. Another 3 litres of water is added to the mixture. The ratio of milk to water in the new mixture is:

A)5 : 1

B)5 : 2

C)5 : 3

D)5 : 4

Q8. A trader sold a cycle at a loss of 10%. If the selling price had been increased by Rs. 200, there would have been a gain of 6%. The cost price of the cycle is:

- A)Rs. 1200
- B)Rs. 1205
- C)Rs. 1250
- D)Rs. 1275

Q9. If the selling price of 40 articles is equal to the cost price of 50 articles, the loss or gain percent is:

- A)25% gain
- B)20% gain
- C)25% loss
- D)20% loss

Q10. By selling a tape recorder for Rs. 1040, a man gains 4%. If he sells it for Rs. 950, his loss will be:

- A)5%
- B)4%
- C)4.5%
- D)9%

SET - 3

Q1. Three numbers are in the ratio 5 : 7 : 12. If the sum of the first and the third numbers is greater than the second number by 50. The sum of the three numbers is:

- A)125
- B)120
- C)95
- D)85

Q2. Two numbers whose sum is 84, cannot be in the ratio of:

- A)5 : 7
- B)13 : 8
- C)1 : 3
- D)3 : 2

Q3. If the radius of a cylinder is increased by 25%, by how much per cent the height must be reduced, so that the volume of the cylinder remains the same.

- A)36
- B)56
- C)64
- D)46

Q4. A solid cone of height 36 cm and radius of base 9 cm is melted to form a solid cylinder of radius 9 cm and height 9 cm. What percent of the material is wasted in this process?

- A)25

- B)0
- C)5
- D)10

Q5. If the price of sugar increases by 20%, one can buy 2 kg less for Rs. 50. What is the amount of sugar that could be bought before the price hike?

- A)10 kg
- B)12 kg
- C)14 kg
- D)16 kg

Q6. Due to a price hike of 20%, 4 kg less sugar is available for Rs 120. What is the initial price per kg of sugar?

- A)Rs. 5 per kg
- B)Rs. 4 per kg
- C)Rs. 6 per kg
- D)Rs. 5.5 per kg

Q7. In 2001, the price of a building was 80% of its original price. In 2002, the price was 60% of its original price. By what percentage did the price decrease?

- A)15%
- B)20%
- C)25%
- D)30%

Q8. Calculate the mean from the following table.

Score s	Frequencies
0-10	2

10-20	4
20-30	12
30-40	21
40-50	6
50-60	3
60-70	2

- A)34.2
 B)33.4
 C)32.6
 D)35.8

Q9. The radius of the incircle of an equilateral ΔABC of side $2\sqrt{3}$ cm is x cm. The value of x is:

- A) $\frac{1}{3}$
 B) $\frac{1}{2}$
 C)1
 D) $\sqrt{3}$

Q10. ABCD is a parallelogram in which $AB = 7$ cm, $BC = 9$ cm and diagonal $AC = 8$ cm. What is the length (in cm) of the other diagonal?

- A)14
 B) $14\sqrt{2}$
 C)7
 D) $7\sqrt{2}$

SET - 4

Q1. If the cost price of 12 pens is equal to the selling price of 8 pens, the gain percent is?

- A] 50%
- B] 40%
- C] 20%
- D] 30%

Q2. Tarun got 30% concession on the labeled price of an article and sold it for Rs. 8750 with 25% profit on the price he bought. What was the labeled price?

- A] 10000
- B] 12000
- C] 15000
- D] 16000

Q3. Find the Remainder of $\frac{78^{193}}{97}$

- A] 97
- B] 193
- C] 41
- D] None

Q4. Find the simple interest earned on Rs.20000 for 2 years at 10% p.a.

- A] Rs.4500
- B] Rs.2000
- C] Rs.4000
- D] Rs.6000

Q5. If Rs.2000 amounts to Rs.2500 in 2 years at simple interest, what is the rate of interest per annum?

- A] 8%
- B] 37.5%
- C] 25%
- D] 12.5%

Q6. Excluding stoppages, the speed of a bus is 54kmph and including stoppages, it is 45kmph. For how many minutes does the bus stop per hour?

- A] 9
- B] 10
- C] 12
- D] 20

Q7. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was

reduced by 200 km/hr and the time of flight increased by 30 minutes. The duration of the flight is:

- A] 1 hour
- B] 5 hour
- C] 6 hour
- D] 7 hour

Q8. A boat goes a certain distance at 30 km/hr and comes back the same distance at 60 km/hr. What is the average speed (in km/hr) for the total journey?

- A] 45
- B] 40
- C] 35
- D] 50

Q9. X can do a piece of work in 20 days working 7 hours a day. The work is started by X and on the second day one man whose capacity to do the work is

twice that of X, joined. On the third day another man whose capacity is thrice that of X, joined and the process continued till the work was completed. In how many days will the work be completed, if everyone works for four hours a day?

- A] 5 days
- B] 8 days
- C] 6 days
- D] 4 days

Q10. There are two solutions of sulphuric acid (acid + water) with concentration of 50% and 80% respectively. They are mixed in a certain ratio to get a 62% sulphuric acid solution. This solution is mixed with 6 liters of water to get back 50% of the solution. How much of the 80% solution has been used in the entire process?

- A] 15 liters
- B] 12 Liters
- C] 10 Liters
- D] None of these

SET - 5

Q1. The ratio of two numbers is 2:5. Their LCM is 120. Determine the second number.

- A] 24
- B] 45
- C] 60
- D] 85

Q2. The present worth of Rs. 1404 due in two equal half-yearly installments at 8% per annum simple interest is:

- A] Rs. 1500
- B] Rs. 1325
- C] Rs. 1450
- D] Rs. 1250

Q3. A card is drawn from a deck of 52 cards. Find the probability of getting a king or a heart or a red card.

- A] $\frac{6}{13}$
- B] $\frac{7}{13}$
- C] $\frac{1}{13}$
- D] $\frac{2}{13}$

Q4. Find the Remainder of $\frac{3^{1002}}{33}$

- A] 1
- B] 3
- C] 9
- D] 33

Q5. Find the Remainder of $\frac{100!}{101}$

- A] 1
- B] 0
- C] 101
- D] None of these

Q6. No. of zeros at the end of $(45!)^{450}$

- A] 10
- B] 450
- C] 10^{45}
- D] 4500

Q7. No. of zeros at the end of $(31)! \times (42)! \times (100)!$

- A] 48
- B] 16
- C] 6
- D] 40

Q8 Two numbers, both greater than 29, have GCD = 29 and LCM = 4147. The sum of the numbers is:

- A] 669
- B] 696
- C] 766
- D] 767

Q9. During the first year, the population of the town increased by 4% and during the second year it diminished by 4%. If at the end of the second year its population was 24960, what was its population at the beginning of the first year?

- A] 24960

- B] 25200
- C] 24000
- D] 25000

Q10. If 97% of the students are present in a class and 18 students are absent, find the total number of students in the class.

- A] 800
- B] 600
- C] 700
- D] 575

CAREERS360

SET - 6

Q1. What is the unit digit in the product (684 x 759 x 413 x 676)?

- A] 6
- B] 8
- C] 2
- D] None of these

Q2. A sum of money is lent at a certain rate of interest at compound interest. If, instead the same amount was lent at simple interest the interest for the first two years reduces by Rs.160 and that for the first three years reduces by Rs.488. Find the sum

- A] Rs.52000
- B] Rs.64000
- C] Rs.32000
- D] Rs.12000

Q3. The difference between the compound interest and simple interest on a certain sum at 12% per annum for 2 years is Rs.126.72. Find the sum.

- A] Rs.8800
- B] Rs.7800
- C] Rs.8000
- D] Rs.8500

Q4. If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance traveled by him is:

- A] 50 km
- B] 56 km
- C] 70 km
- D] 80 km

Q5. A train can travel 50 % faster than a car. Both start from point A at the same time and reach point B away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:

- A] 100 kmph
- B] 120 kmph
- C] 210 mph
- D] 200kmph

Q6. 2.A boat goes a certain distance at 30 km/hr and comes back the same distance at 60 km/hr. What is the average speed (in km/hr) for the total journey?

- A] 45
- B] 40
- C] 35
- D] 55

Q7. Ram completes 60% of a task in 15 days and then takes the help of Rahim and Rachel. Rahim is 50% as efficient as Ram is and Rachel is 50% as efficient as Rahim is. In how many more days will they complete the work?

- A] 40/7
- B] 20/7
- C] 30/7
- D] 10/7

Q8. Three taps A, B and C can fill a tank in 12, 15 and 20 hours respectively. If A is open all the time and B and C are open for one hour each alternately, the tank will be full in:

- A] 7 hour

- B] 5 hour
- C] 3 hour
- D] 4 hour

Q9. Two solutions of 90% and 97% purity are mixed resulting in 21 liters of mixture of 94 % purity. How much is the quantity of the first solution in the resulting mixture?

- A] 15 liters
- B] 12 liters
- C] 9 liters
- D] 6 liters

Q10. Length of one side of a parallelogram is 10 cm, then the length of its adjacent side, when perimeter of parallelogram given as 50 cm is

- A] 15cm
- B] 12cm
- C] 10cm
- D] 16cm

SET - 7

Q1. In the land of the famous milkman Merghese Durian, a milkman sells his buffalo for Rs. 720 at some profit. Had he sold his buffalo at Rs. 510, the quantum of the loss incurred would have been double that of the profit earned. What is the cost price?

- A] 650
- B] 750
- C] 1350
- D] 1250

Q2.A Camera shop allows a discount of 10% on the advertised price of a camera. What price must be marked on the camera, that costs him Rs. 600, so that he makes a profit of 20%?

- A] 720
- B] 800
- C] 750
- D] 350

Q43. Find the remainder when 47^{100} is divided by 100

- A] 1
- B] 41
- C] 61
- D] 81

Q4. Find the effective rate of interest if the normal rate of interest is 10% p.a. and the interest is compounded every six months.

- A] 21.5%
- B] 10.25%
- C] 5.25%
- D] 10%

Q5. Find the compound interest on Rs. 8000 at 4% per annum for 2 years compounded annually

- A] R 652.80`
- B] R 452.80
- C] R 652.80
- D] R 552.80

Q6. In covering a distance of 30 km, Abhay takes 2 hours more than Sameer. If Abhay doubles his speed, then he would take 1 hour less than Sameer. Abhay's speed is:

- A] 5 kmph
- B] 10 kmph
- C] 12 kmph
- D] 8 kmph

Q7. Robert is traveling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.?

- A] 8 kmph
- B] 12 kmph
- C] 10 kmph
- D] 14 8 kmph

Q8. A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

- A] 12.5 km/hr
- B] 5.5 km/hr
- C] 6.5 km/hr
- D] 10 km/hr

Q9. A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

- A] 12 days
- B] 15 days
- C] 10 days
- D] 25 days

Q10. There are two containers: the first contains 500ml of alcohol, while the second contains 500 ml of water. Three cups of alcohol from the first container is removed and is mixed well in the second container. Then three cups of this mixture is removed and is mixed in the first container. Let 'A' denote the proportion of water in the first container and 'B' denote the proportion of alcohol in the second container. Then A,

- A] $A > B$
- B] $A < B$
- C] $A = B$
- D] Cannot be determined

SET - 8

Q1. The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit?

- A] 3000
- B] 2000
- C] 4000
- D] 2500

Q2. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

- A] 16
- B] 15
- C] 12
- D] 14

Q3. Remainder when $(1! + 2! + 3! + \dots + 4000!)$ is divided by 7

- A] 7
- B] 1
- C] 5
- D] None of these

Q4. Find the present value (in Rs.) of Rs.3000 due after 5 years at 10% p.a. simple interest.

- A] 1500
- B] 1800
- C] 2000
- D] 2500

Q5. A sum of money invested at simple interest amounts to Rs 2480 at the end of four years and Rs.4080 at the end of eight years. Find the principal.

- A] Rs.2040
- B]Rs. 1480
- C] Rs.1240
- D] Rs.880

Q6.A man completes a journey in 10 hours. He travels the first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

- A] 220 km
- B] 224 km
- C] 200 km
- D] 240 km

Q7.The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is:

- A] 12.5 km/hr
- B] 27 km/hr
- C] 20 km/hr
- D] 87.5 km/hr

Q8. A train is running at a speed of 116 km/h. The distance covered by the train in meters in 18 seconds is:

- A] 580 meters
- B] 480 meters
- C] 280 meters
- D] 380 meters

Q9. P, Q and R can do work in 20, 30 and 60 days respectively. How many days does it take to complete the work if P does the work and he is assisted by Q and R on every third day?

- A] 15 days
- B] 10 days
- C] 25 days
- D] 45 days

Q10. A large tanker can be filled by two pipes A and B in 60 minutes and 40 minutes respectively. How many minutes will it take to fill the tanker from an empty state if B is used for half the time and A and B fill it together for the other half?

- A] 15 min
- B] 20 min
- C] 30 min
- D] 40 min

SET - 9

Q1. ABCD is a rhombus, then the measure of $\angle CDB$ is

- A] 30°
- B] 60°
- C] 40°
- D] 50°

Q2. The monthly salaries of two persons are in the ratio of 4:7. If each receives an increase of Rs.25 in the salary, the ratio is altered to 3: 5. Find their respective salaries.

- A] 120 & 210
- B] 80 & 140
- C] 180 & 300
- D] 200 & 350

Q3. The true discount on Rs. 1760 due after a certain time at 12% per annum is Rs. 160. The time after which it is due is:

- A] 6 months
- B] 8 months
- C] 5 months
- D] 10 months

Q4. In a game two players, A and B take turns in throwing a pair of fair dice starting with player A and a total of scores on the two dice, in each throw is noted. A wins the game if he throws a total of 6 before B throws a total of 7 and B wins the game if he throws a total 7 before A throws a total six. The game stops as soon as either of the players wins. The probability of A winning the game is:

- A] $\frac{31}{61}$
- B] $\frac{5}{6}$

- $\frac{30}{61}$
C] $\frac{30}{61}$
D] 1

Q5. What is the largest number which divides 97 and 65 leaving remainders of 7 and 5 respectively?

- A] 60
B] 30
C] 15
D] 10

Q6. What is the largest number that divides 23, 37 and 79 leaving the same remainder in each case?

- A] 2
B] 7
C] 12
D] 14

Q7. What is the last remainder when 223 is successively divided by 4, 5 and 6?

- A] 5
B] 0
C] 3
D] 1

Q8. Which of the following leaves no remainder when divided by 100?

- A] $11^{10} - 1$
B] $10^8 - 10$
C] $4^6 - 3^6$
D] $5^6 - 5^2$

Q9. The value of $p(2)$ of the polynomial is

- A] 3
- B] -3
- C] 2
- D] -2

Q10. Which of the following is the smallest five digit number which when divided by 8, 11 and 24 leaves a remainder of 5 in each case?

- A] 10301
- B] 10125
- C] 10061
- D] 10037

SET - 10

Q1. The percentage profit made when an article is sold for Rs. 78 is twice as much as when it is sold for Rs. 69. The cost of the article is:

- A)Rs. 60
- B)Rs. 51
- C)Rs. 55.50
- D)Rs. 70

Q2. The profit (in Rs.) after selling an article for Rs. 524 is the same as the loss (in Rs.) after selling it for Rs. 452. The cost price of the article is:

- A)Rs. 480
- B)Rs. 485
- C)Rs. 488
- D)Rs. 500

Q3. Two numbers are in the ratio 3 : 5. If 6 is added to each of them the ratio becomes 2 : 3. The numbers are:

- A)21 and 35
- B)30 and 50
- C)24 and 40
- D)18 and 30

Q4. The sum of the three numbers is 540. The ratio of second to third is 9 : 13 and that of first to third is 2 : 7. The third number is:

- A)273
- B)280

C)250

D)286

Q5. Three boxes of capacities 24 kg, 36 kg and 84 kg are filled with three varieties of wheat A, B and C respectively. All three boxes were emptied, the three types of wheat were thoroughly mixed, and the mixture was put back in the three boxes. How many kilograms of type A wheat would be in the third box (in kg)?

A)10 kg

B)12 kg

C)14 kg

D)16 kg

Q6..A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

A] 5

B] 7

C] 9

D] 7.2

Q7. An airplane covers a certain distance at a speed of 240 kmph in 5 hours to cover the same distance in $1\frac{2}{3}$ hours, it must travel at a speed of:

A] 300 kmph

B] 360 kmph

C] 400 km h

D] 720 kmph

Q8.To cover a certain distance at a speed of 60 km/h, a train takes 15 hours. If it covers the same distance in 12 hours, what will its speed be?

A] 9

B] 10

C] 5

D] 12

Q9. A can do work in 18 days. When he had work for 2 days, B joined him. If they complete the remaining work in 4 more days . In how many days B alone finishes the whole work?

A] 6 days.

B] 5 days.

C] 10 days.

D] 8 days.

Q10. There are two mixtures of honey and water, the quantity of honey in them being 25% and 75 % of the mixture. If 2 gallons of the first are mixed with three gallons of the second, what will be the ratio of honey to water in the new mixture?

A] 11 : 2

B] 11 : 9

C] 9 : 11

D] 2 : 11

ANSWER KEY

SET 1									
1	2	3	4	5	6	7	8	9	10
B	C	B	B	D	D	C	A	B	B

SET 2									
1	2	3	4	5	6	7	8	9	10
C	C	B	B	A	B	B	C	A	A

SET 3									
1	2	3	4	5	6	7	8	9	10
B	D	A	A	B	A	C	B	C	A

SET 4									
1	2	3	4	5	6	7	8	9	10
A	A	D	C	D	B	A	B	A	C

SET 5									
1	2	3	4	5	6	7	8	9	10
C	B	B	C	D	D	D	B	D	B

SET 6									
1	2	3	4	5	6	7	8	9	10
B	B	A	A	B	B	A	A	C	A

SET 7									
1	2	3	4	5	6	7	8	9	10
A	B	A	B	A	A	B	D	B	C

SET 8									
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1	2	3	4	5	6	7	8	9	10
B	A	C	C	D	B	D	A	A	C
SET 9									
1	2	3	4	5	6	7	8	9	10
B	D	D	C	B	D	A	D	B	D
SET 10									
1	2	3	4	5	6	7	8	9	10
A	C	D	A	C	D	D	A	A	B

SOLUTIONS

SET - 1

1-B

Production of the D type of the cycle in 1998 = 105

Production of the D type of the cycle in 2000 = 125

Increase in production of the D type of the cycle from 1998 to 2000 = $125 - 105 = 20$

Percentage increase = $\frac{20 \times 100}{105} = 19.05\%$

The approximate percentage increase in production of the D type of the cycle from 1998 to 2000 is 19%.

Hence, the answer is 19%.

2-C

The average of 20 numbers = 35

The sum of 20 numbers = $20 \times 35 = 700$

Now add 85 and subtract 45,

Correct sum = $700 - 45 + 85 = 740$

\therefore Correct average = $\frac{740}{20} = 37$

Hence, the correct answer is 37.

3-B

Given: The diameter of a wheel on a bicycle is 21 cm. The cyclist takes 45 minutes to reach a destination at a speed of 16.5 km/h.

Here, $16.5 \text{ km/h} = \frac{16500}{60} \text{ m/min} = 275 \text{ m/min.}$

So, the total distance of the journey is = $(275 \times 45) = 12375 \text{ metres} = 1237500 \text{ cm.}$

Here, the diameter of a wheel on a bicycle is 21 cm \Rightarrow the radius is = $\frac{21}{2} \text{ cm.}$

$$\Rightarrow \text{the circumference of the wheel} = \left(2 \times \frac{22}{7} \times \frac{21}{2}\right) \text{ cm} = 66 \text{ cm}$$

4-B

Given: The diameter of a wheel on a bicycle is 21 cm. The cyclist takes 45 minutes to reach a destination at a speed of 16.5 km/h.

$$\text{Here, } 16.5 \text{ km/h} = \frac{16500}{60} \text{ m/min} = 275 \text{ m/min.}$$

So, the total distance of the journey is =
 $(275 \times 45) = 12375 \text{ metres} = 1237500 \text{ cm.}$

Here, the diameter of a wheel on a bicycle is 21 cm \Rightarrow the radius is = $\frac{21}{2} \text{ cm.}$

$$\Rightarrow \text{the circumference of the wheel} = \left(2 \times \frac{22}{7} \times \frac{21}{2}\right) \text{ cm} = 66 \text{ cm}$$

Therefore, during the journey, the wheel will make $\left(\frac{1237500}{66}\right) = 18750$ revolutions.
 Hence, the correct answer is 18750 revolutions.

5-D

Let the ages of boys be 3x years and 4x years, respectively.

According to the given condition:

After 3 years,

$$\frac{3x + 3}{4x + 3} = \frac{4}{5}$$

$$\Rightarrow 15x + 15 = 16x + 12$$

$$\Rightarrow x = 3$$

Therefore, the required ratio after 21 years is:

$$\frac{3 \times 3 + 21}{4 \times 3 + 21}$$

$$\frac{9 + 21}{12 + 21}$$

$$= \frac{30}{33}$$

$$= \frac{10}{11}$$

$$= \frac{10}{11}$$

Thus, the ratio of the age after 21 years is 10 : 11.
Hence, the correct answer is 10 : 11.

6-D

Let the ages of A and B be $4x$ and $3x$.

According to the question,

$$4x + 6 = 26$$

$$\Rightarrow 4x = 20$$

$$\Rightarrow x = 5$$

So, the age of B = $(3 \times 5) = 15$ years

Hence, the correct answer is 15 years.

7-C

Let the cost price (CP) be Rs. x .

Selling price (SP) of the bag = Rs. 230 and profit = 15%

$$SP = \frac{100 + \text{Profit \%}}{100} \times CP = Rs.230$$

$$\Rightarrow \frac{115x}{100} = Rs.230$$

$$\Rightarrow x = \frac{230}{115} \times 100$$

$$\Rightarrow x = Rs. 200$$

For a profit of 20%,

$$\text{The new selling price of the bag} = \frac{100 + 20}{100} \times 200 = \frac{120}{100} \times 200 = Rs.240$$

Thus, selling price = Rs. 240

Hence, the correct answer is Rs. 240.

8-A

Total number of students = 1400

$$\text{Number of students wearing spectacles} = 1400 \times \frac{25}{100} = 350$$

$$\text{Number of boys wearing spectacles} = 350 \times \frac{2}{7} = 100$$

Therefore, the number of girls wearing spectacles = $350 - 100 = 250$

Hence, the correct answer is 250.

9-B

Let the total number of students be x .

Boys = 60%

Girls = 40%

According to the question,

$$\frac{40x}{100} = 812$$

$$\Rightarrow x = 2030$$

The total number of students = 2030

Now, number of boys = (total students – number of girls) = 2030 – 812 = 1218

Hence, the correct answer is 1218.

10-B

Let the present age of R be $11x$ and S be $17x$.

According to the given condition,

$$\frac{11x - 11}{17x - 11} = \frac{11}{20}$$

$$\Rightarrow 220x - 220 = 187x - 121$$

$$\Rightarrow 33x = 99$$

$$\Rightarrow x = 3$$

Thus, the present age of R is $11 \times 3 = 33$ years

Hence, the correct answer is 33 years.

SET - 2

1-C

Average marks of 50 students = 70%

Total percentage of marks of 50 students = $5 \times 70\% = 3500\%$

Average of first 25 students = 60%

Total percentage of marks of 25 students = $25 \times 60\% = 1500\%$

Average marks of the next 24 students = 80%

Total percentage of marks of 24 students = $24 \times 80\% = 1920\%$

Percentage of Marks Obtained by the last student = $3500\% - (1500 + 1920)\% = 80\%$

Hence, the correct answer is 80%.

2-C

Passed in History = 65%

Failed in History = $(100 - 65) = 35\%$

Passed in Hindi = 55%

Failed in Hindi = $(100 - 55) = 45\%$

Failed in Both = 5%

So, the percentage of students who failed in a minimum of one subject = $(35 + 45) - 5 = 75\%$

Therefore, the percentage of those students who have passed both subjects = $(100 - 75) = 25\%$

Hence, the correct answer is 25%.

3-B

Let the maximum marks be 100%.

According to the question,

40% marks are equivalent to $(67 + 13) = 80$ marks

$$\frac{80 \times 100}{40} = 200 \text{ marks}$$

Now, 100% marks are equivalent to

So, the maximum marks = 200

Hence, the correct answer is 200.

4-B

Let their radii be x and $2x$ and their heights be h and H respectively

According to the question,

$$\frac{V_1}{V_2} = \frac{\frac{1}{3}\pi r_1^2 h_1}{\frac{1}{3}\pi r_2^2 h_2}$$

$$\text{or, } \frac{V_1}{V_2} = \frac{r_1^2 h_1}{r_2^2 h_2}$$

$$\text{or, } \frac{2}{3} = \frac{x^2 h}{(2x)^2 H}$$

$$\text{or, } \frac{2}{3} = \frac{x^2 h}{4x^2 H}$$

$$\text{or, } \frac{h}{H} = \frac{8}{3}$$

Hence, the answer is 8:3.

5-A

Given: Height of the vessel = 8 cm

Radius = 5 cm.

$$\text{Volume of the conical vessel} = \frac{1}{3}\pi r^2 h$$

$$\Rightarrow \frac{1}{3} \times \pi \times 5^2 \times 8$$

$$\Rightarrow \frac{200}{3} \pi \text{ cm}^3$$

$$\text{The volume of 25% of water} = \frac{1}{4} \times \frac{200}{3} \pi = \frac{50}{3} \pi \text{ cm}.$$

$$\text{The volume of the spherical metallic ball of the radius } R = \frac{4}{3}\pi R^3.$$

$$\Rightarrow \frac{4}{3} \times \pi \times \left(\frac{1}{2}\right)^3 = \frac{\pi}{6} \text{ cm}^3$$

$$\text{The number of balls required} = \frac{\frac{50}{3}\pi}{\frac{\pi}{6}}$$

$$= \frac{50}{3} \pi \times \frac{6}{\pi}$$

$$= 100$$

Hence, the correct answer is 100.

6-B

Bottle 1 has milk : water = 2 : 5

Bottle 2 has milk : water = 3 : 4

Bottle 3 has milk : water = 4 : 5

$$\text{Bottle 1 contains milk} = \frac{2}{7}, \text{ water} = \frac{5}{7}$$

$$\text{Bottle 2 contains milk} = \frac{3}{7}, \text{ water} = \frac{4}{7}$$

$$\text{Bottle 3 contains milk} = \frac{4}{9}, \text{ water} = \frac{5}{9}$$

When mixed, the ratio of milk and water is

$$\begin{aligned} & \left(\frac{2}{7} + \frac{3}{7} + \frac{4}{9}\right) : \left(\frac{5}{7} + \frac{4}{7} + \frac{5}{9}\right) \\ & = \left(\frac{18 + 27 + 28}{63}\right) : \left(\frac{45 + 36 + 35}{63}\right) = 73 : 116 \end{aligned}$$

Hence, the correct answer is 73 : 116.

7-B

The total quantity of the mixture is 25 litres.

Milk : Water = 4 : 1

$$\text{Milk} = \frac{4}{5} \times 25 = 20 \text{ litres}, \text{Water} = \frac{1}{5} \times 25 = 5 \text{ litres}$$

If 3 litres of water are added then the ratio becomes = 20 : (5 + 3) = 20 : 8 = 5 : 2

Hence, the correct answer is 5 : 2.

8-C

Let the cost price of the cycle be x.

$$SP \text{ when loss is } 10\% = \frac{100 - \text{Loss percentage}}{100} \times CP = \frac{90x}{100}$$

$$\text{Selling price when profit is } 6\% = \frac{100 + \text{Profit percentage}}{100} \times \text{Costprice} = \frac{106x}{100}$$

$$\text{Difference} = \frac{106x}{100} - \frac{90x}{100} = \frac{16x}{100}$$

$$\text{So, } \frac{16x}{100} = 200$$

$$\Rightarrow x = \frac{20000}{16}$$

$$\Rightarrow x = 1250$$

So, the cost price is Rs. 1250.

Hence, the correct answer is Rs. 1250.

9-A

Let the cost price of each article be Re. 1.

Selling price (SP) of 40 articles = Cost price (CP) of 50 articles = Rs. 50

CP of 40 articles = Rs. 40

Profit on 40 articles = SP of 40 articles – CP of 40 articles

$$\text{Profit}\% = \frac{\text{Profit}}{\text{CP}} \times 100$$

$$= \frac{10}{40} \times 100$$

= 25%

Hence, the correct answer is 25% gain.

10-A

Let the cost price (CP) be x .

The selling price of the tape recorder is Rs. 1040.

The selling price is equal to 104% of x .

$$\text{Selling price} = \frac{104x}{100} = \text{Rs.}1040$$

$$\text{Cost Price}(x) = \frac{1040 \times 100}{104} = \text{Rs.}1000$$

If it is sold for Rs. 950, there is a loss of Rs. 50.

$$\text{Loss}\% = \frac{\text{Loss}}{\text{CP}} \times 100\% = \frac{50}{1000} \times 100\% = 5\%$$

Hence, the correct answer is 5%.

SET - 3

1-B

Let the first number be $5x$, the second number be $7x$ and the third number be $12x$.

According to the question,

$$5x + 12x = 7x + 50$$

$$\Rightarrow 10x = 50$$

$$\Rightarrow x = 5$$

The required sum of the numbers is:

$$5x + 7x + 12x = 24x = 24 \times 5 = 120$$

Hence, the correct answer is 120.

2-D

The number 84 must be a multiple of the sum of the terms of the ratio.

By checking options

Option 1. The sum of 5 and 7 = 12 divides 84

Option 2. The sum of 13 and 8 = 21 divides 84

Option 3. The sum of 1 and 3 = 4 divides 84

Option 4. The sum of 3 and 2 = 5 does not divide 84

Hence, the correct answer is 3 : 2.

3-A

Given: The radius of a cylinder is increased by 25%.

Volume of the cylinder = $\pi r^2 h$

Let h be the initial height, r be the initial radius, H be the final height and the new radius

will be $\frac{125}{100}r = \frac{5}{4}r$.

According to the question,

$$\pi \times r^2 \times h = \pi \times \left(\frac{5}{4}r\right)^2 \times H$$

$$h = \frac{25}{16} \times H$$

$$\frac{h}{H} = \frac{25}{16}$$

The decrease in percentage in the height is $\frac{(h - H)}{h} \times 100$

$$\Rightarrow \frac{(25 - 16)}{25} \times 100$$

$$\Rightarrow 9 \times 4 = 36\%$$

Hence, the correct answer is 36.

4-A

Given: Height of the cone = 36 cm

Radius of base = 9 cm

Radius of cylinder = 9 cm

Height = 9 cm.

The volume of cone = $\frac{1}{3}\pi r^2 h$

$$\Rightarrow \frac{1}{3} \times \pi \times 9^2 \times 36 = 972\pi \text{ cm}^3$$

Volume of cylinder = $\pi r^2 h$.

$$\Rightarrow \pi \times 9^2 \times 9 = 729\pi \text{ cm}^3$$

The volume of waste = volume of cone – volume of cylinder

$$\Rightarrow 972\pi - 729\pi = 243\pi$$

$$\begin{aligned} \text{The material wasted} &= \frac{\text{volume of cone} - \text{volume of cylinder}}{\text{volume of cone}} \\ &= \frac{243\pi}{972\pi} \times 100 = 25\% \end{aligned}$$

Hence, the correct answer is 25%.

5-B

Let the initial price be x .

$$\text{Increment in price is 20\%, means increased price} \Rightarrow \frac{120x}{100} = \frac{6x}{5}$$

According to the question,

Initial quantity – current quantity = reduction in quantity

$$\Rightarrow \frac{50}{x} - \frac{50}{\frac{6x}{5}} = 2$$

$$\Rightarrow \frac{50}{x} - \frac{250}{6x} = 2$$

$$\Rightarrow \frac{300 - 250}{6x} = 2$$

$$\Rightarrow x = \frac{50}{12}$$

$$\text{Initial quantity} = \frac{50}{\left(\frac{50}{12}\right)} = 12\text{kg}$$

Hence, the correct answer is 12 kg.

6-A

Let the initial price be x .

$$\text{Increment in price is 20\%, means increased price} \Rightarrow \frac{120x}{100} = \frac{6x}{5}$$

According to the question,

Initial quantity – current quantity = reduction in quantity

$$\Rightarrow \frac{120}{x} - \frac{120}{\frac{6x}{5}} = 4$$

$$\Rightarrow \frac{120}{x} - \frac{600}{6x} = 4$$

$$\Rightarrow \frac{120}{x} - \frac{100}{x} = 4$$

$$\Rightarrow \frac{20}{x} = 4$$

$$\Rightarrow x = 5$$

The initial price per kg of sugar was Rs. 5 per kg

Hence, the correct answer is Rs. 5 per kg.

7-C

Change in price = $(80 - 60) = 20\%$

The base price of that year = 80%

$$\text{Required Percentage} = \frac{20}{80} \times 100 = 25\%$$

Hence, the correct answer is 25% .

8-B

Score s	Frequencies	Mid Point	Mid Point x Frequencies
0-10	2	5	10
10-20	4	15	60
20-30	12	25	300
30-40	21	35	735
40-50	6	45	270
50-60	3	55	165
60-70	2	65	130

$$\text{Mean} = \frac{\sum (\text{Mid Point} \times \text{Frequencies})}{\sum \text{Mid Point}}$$

$$\text{Mean} = \frac{10 + 60 + 300 + 735 + 270 + 165 + 130}{2 + 4 + 12 + 21 + 6 + 3 + 65}$$

$$\text{Mean} = \frac{1670}{50}$$

Mean = 33.4

Hence, the answer is 33.4.

9-C

The radius of the incircle of an equilateral triangle is given by the formula = $\frac{a}{2\sqrt{3}}$ where a is the side length of the triangle.

Given that the length of the sides of the equilateral triangle ABC is $2\sqrt{3}$ cm.

$$x = \frac{2\sqrt{3}}{2\sqrt{3}} = 1$$

Hence, the value of X is 1 cm.

10-A

In parallelogram ABCD,

The formula of diagonals is

$$AC^2 + BD^2 = 2(AB^2 + BC^2)$$

$$\Rightarrow 8^2 + BD^2 = 2(7^2 + 9^2)$$

$$\Rightarrow 64 + BD^2 = 2(49 + 81) = 260$$

$$\Rightarrow BD^2 = 260 - 64 = 196$$

$$\Rightarrow BD = 14 \text{ cm}$$

Hence, the length of the other diagonal is 14 cm.

SET - 4

1-A

$$\text{Profit \%} = \left(\frac{4}{8}\right) \times 100 = 50\%$$

2-A

Let MP = 100

CP = 70

S = $70 \times 1.25 = 87.5$

Now 87.5 % = 8750

MP = 100% = 10000

3-D

$78^{193}/97$

$78^1/97=78$

4-C

S.I = $(2000 \times 2 \times 10) / 100 = 4000$

Or S.I = RT% of P = $10 \times 2 \%P$ of P i.e 20 % of
 $= 20/100 \times 20000 = 4000$.

5-D

I = A-P

$= 2500 - 2000 = 500$

$500 / 2000 \times 100 = 25 \%$

Interest for 2 years = 25 %

Interest for 1 years = $25\% / 2 = 12.5 \%$

6-B

Due to stoppages, it covers 9 km less.

Time taken to cover $9 \text{ km} = \left(\frac{9}{54} \times 60 \right) \text{ min} = 10 \text{ min.}$

7-A

Let the duration of the flight be x hours.

$$\text{Then, } \frac{600}{x} - \frac{600}{x + (1/2)} = 200$$

$$\Rightarrow \frac{600}{x} - \frac{1200}{2x + 1} = 200$$

$$\Rightarrow x(2x + 1) = 3$$

$$\Rightarrow 2x^2 + x - 3 = 0$$

$$\Rightarrow (2x + 3)(x - 1) = 0$$

$$\Rightarrow x = 1 \text{ hr. [neglecting the -ve value of } x]$$

8-B

Given: Speed of boat is 30 km/hr and 60 km/hr for same distance.

So, Average speed = $\frac{2xy}{x+y}$ (for same distance)

Putting the values $x = 30$ and $y = 60$

$$\text{Average speed} = \frac{2 \times 30 \times 60}{30 + 60} \Rightarrow \frac{3600}{90}$$

Average speed = 40

9-A

Since X takes 20 days working 7 hours a day to complete the work, the number of day-hours required to complete this work would be 140 day-hours. Like in the two problems above, this is going to be constant throughout. So, $W = 140$ day-hours.

Amount of work done in the 1st day by X = 1 day \times 4 hours = 4 day-hours

2nd day, X does again 4 day-hours of work. The second person is twice as efficient as X so he will do 8 day-hours of work. Total work done on the second day = $8 + 4 = 12$ day-hours. Amount of work completed after two days = $12 + 4 = 16$ day-hours.

3rd day, X does 4 day-hours of work. Second Person does 8 day-hours of work. Third person who is thrice as efficient as X does 12 day-hours of work. Total work done on 3rd day = $4 + 8 + 12 = 24$ day-hours Amount of work completed after 3 days = $16 + 24 = 40$ day-hours

Similarly on 4th day the amount of work done would be $4 + 8 + 12 + 16 = 40$ day-hours

Work done on the 5th day = $4 + 8 + 12 + 16 + 20 = 60$ day-hours

Total work done after 5 days = $4 + 12 + 24 + 40 + 60 = 140$ day-hours = W . So it takes 5 days to complete the work.

10-C

$$\begin{array}{ccc}
 & 62 & \\
 & / \quad \backslash & \\
 18 & & 12
 \end{array}
 \quad = 3:2$$

$$\begin{aligned}
 3x/2x+6 &= 1/1 = 3x = 2x+6 \\
 x &= 6 \\
 \text{Quantity of 80 \% solution} &= 6 \times 2 = 12 \text{ L}
 \end{aligned}$$

SET - 5

1-C

$$2 : 5 = 120$$

$$2x : 5x = 120$$

$$10x = 120$$

$$x = 12$$

Second number is 60

2-B

Required sum = P.W. of Rs. 702 due 6 months + P.W. of Rs. 702 due 1 year hence

$$= \text{Rs.} \left[\left(\frac{100 \times 702}{100 + 8 \times \frac{1}{2}} \right) + \left(\frac{100 \times 702}{100 + (8 \times 1)} \right) \right]$$

$$= \text{Rs.} (675 + 650)$$

$$= \text{Rs.} 1325.$$

3-B

We know that, in a deck,

Total no. of cards = 52

No. of kings = 4

No. of heart cards = 13

& total no. of red cards = 13 + 13 = 26

Thus, favorable outcomes = 4 + 13 + 26 – 13 – 2

$$= 28$$

Now,

Probability = no. of favorable outcomes / total no. of outcomes

$$= 28 / 52$$

$$= 7/13$$

4-C

$$3^{1002}/33$$

$$3^{10 \cdot 100 + 1}/11 = 3$$

$$3 \cdot 3 = 9$$

5-D

$$100!/101$$

$$(p-1)!/p = (p-1) \quad (p = \text{prime number})$$

6-D

$$45!^{450}$$

$$45/5 = 9$$

$$9+1 = 10$$

$$(10 \text{ zeros})^{450}$$

$$10 \cdot 450 = 4500$$

7-D

$$31! \cdot 42! \cdot 100!$$

$$7+9+24 = 40$$

8-B

Product of numbers = $29 \cdot 4147$.

Let the numbers be $29a$ and $29b$.

$$\text{Then, } 29a \cdot 29b = (29 \cdot 4147)$$

$$\Rightarrow ab = 143.$$

Now, co-primes with product 143 are (1, 143) and (11, 13).

So, the numbers are ($29 \cdot 1$, $29 \cdot 143$) and ($29 \cdot 11$, $29 \cdot 13$).

Since both numbers are greater than 29, the suitable pair is ($29 \cdot 11$, $29 \cdot 13$)

i.e., (319, 377).

Required sum = $(319 + 377) = 696$.

9-D

$24960 = \text{initial} \times (104/100) \times (96/100)$

Initial population = 25000

10-B

Absent students = $(100 - 97)\% = 18$

$3\% = 18$

$100\% = 600$

SET - 6

1-B

$684 \times 759 \times 413 \times 676$

$4 \times 9 \times 3 \times 6 = 648$

Last digit = 8

2-B

B is the difference B/w 2 years of interest So $B = 160$

Difference B/w 3 years of C.I and S.I

$= 3B + C = 488$

$160 \times 3 + C = 8$

C is calculated on 8

$= \text{rate} = 8 / 160 \times 100 = 5\%$

$A = 160 / 5 \times 100 = 3200$

$P = 3200 / 5 \times 100$

$P = 64000$ Rs.

3-A

Difference B/W C.I and S.I = $P (r/100)^2$

$126.72 = p (12/100)^2$

$P = 8800$

4-A

Let the actual distance traveled be x km.

Then,

$$\frac{x}{10} = \frac{x + 20}{14}$$

$$\Rightarrow 14x = 10x + 200$$

$$\Rightarrow 4x = 200$$

$$\Rightarrow x = 50 \text{ km.}$$

5-B

Let the speed of the car be x kmph.

$$\text{Then, speed of the train} = \frac{150}{100}x = \left(\frac{3}{2}x\right) \text{ kmph.}$$

$$\therefore \frac{75}{x} - \frac{75}{(3/2)x} = \frac{125}{10 \times 60}$$

$$\Rightarrow \frac{75}{x} - \frac{50}{x} = \frac{5}{24}$$

$$\Rightarrow x = \left(\frac{25 \times 24}{5}\right) = 120 \text{ kmph.}$$

6-B

Given: Speed of boat is 30 km/hr and 60 km/hr for same distance.

So, Average speed = $\frac{2xy}{x+y}$ (for same distance)

Putting the values $x = 30$ and $y = 60$

$$\text{Average speed} = \frac{2 \times 30 \times 60}{30 + 60} \Rightarrow \frac{3600}{90}$$

$$\text{Average speed} = 40$$

7-A

Ram completes 60% of the task in 15 days.

i.e., he completes 4% of the task in a day.

Rahim is 50% as efficient as Ram is.

Therefore, Rahim will complete 2% of the task in a day.

Rachel is 50% as efficient as Rahim is

Therefore, Rachel will complete 1% of the task in a day.

Together, Ram, Rahim and Rachel will complete $4 + 2 + 1 = 7\%$ of the work in a day.

They have another 40% of the task to be completed.

Therefore, they will take $40/7$ more days to complete the task.

8-A

Part filled by pipe A in 1 hour = $1/12$

Part filled by pipe B in 1 hour = $1/15$

Part filled by pipe C in 1 hour = $1/20$

In first hour, A and B is open

In second hour, A and C is open

then this pattern goes on till the tank fills

Part filled by pipe A and pipe B in 1 hour = $1/12 + 1/15 = 9/60 = 3/20$

Part filled by pipe A and pipe C in 1 hour = $1/12 + 1/20 = 8/60 = 2/15$

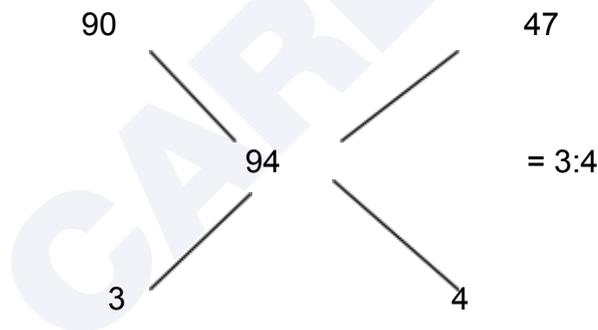
Part filled in 2 hour = $3/20 + 2/15 = 17/60$

Part filled in 6 hour = $17/60 \times 3 = 17/20$ Remaining part = $(1 - 17/20) = 3/20$

Now, 6 hours are over and only $3/20$ part needed to be filled. At this 7th hour, A and B is open Time taken by pipe A and B to fill this $3/20$ part = 1 hour

Total time taken = 6 hour + 1 hour = 7 hour

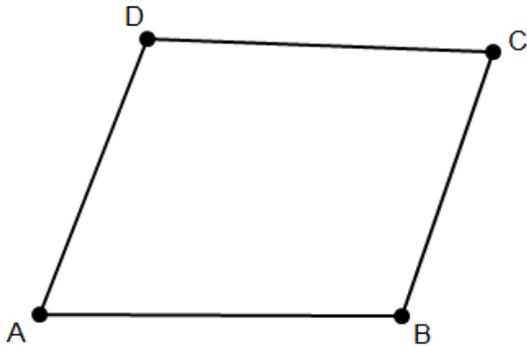
9-C



First solution = $3/7 \times 21 = 9L$

10-A

From the concept, the opposite side of a parallelogram is equal.



Let ABCD is parallelogram, $AB = 10$ cm and AB and BC are adjacent side

$AB = CD$ and $AD = BC$ (opposite sides)

$$AB + BC + CD + DA = 50$$

$$10 + BC + 10 + DA = 50$$

$$BC + DA + 20 = 30$$

$$BC = 15$$

$$BC = DA = 15 \text{ cm}$$

SET - 7

1-A

$$SP = 720$$

$$\text{New SP} = 510$$

$$\text{Difference} = 720 - 510$$

$$\text{Now } P : L = 1 : 2$$

$$P = 200 \times \left(\frac{1}{3}\right) = 70$$

$$\text{Then } CP = 720 - 70 = 650$$

2-B

$$CP = 600$$

$$SP = 600 \times 1.20 = 720$$

$$.9 \times MP = 720$$

$$MP = 800$$

3-A

$$47^{100}/100$$

$$= (-1+10)^{50}$$

$$\diamond 1-500=-499$$

$$\diamond -499+1000=501$$

$$\diamond 1$$

4-B

for this take 100 as principal

R = 10 % and half yearly rate will be 5 %

$$5+5+0.25 = 10.25$$

5-A

Here, $P = \text{R } 8000$, $R = 4\%$, Time = 2 years

Now, according to the formula,

$$\text{Amount} = P\left(1 + \frac{R}{100}\right)^n = 8000 \left(1 + \frac{4}{100}\right)^2 = 8000 \times \frac{26}{25} \times \frac{26}{25} = \text{R } 8652.80$$

$$\therefore \text{CI} = \text{R } (8652.80 - 8000) = \text{R } 652.80$$

6-A

Let Abhay's speed be x km/hr.

$$\text{Then, } \frac{30}{x} - \frac{30}{2x} = 3$$

$$\Rightarrow 6x = 30$$

$$\Rightarrow x = 5 \text{ km/hr.}$$

7-B

Let the distance traveled by x km.

$$\text{Then, } \frac{x}{10} - \frac{x}{15} = 2$$

$$\Rightarrow 3x - 2x = 60$$

$$\Rightarrow x = 60 \text{ km.}$$

$$\text{Time taken to travel } 60 \text{ km at } 10 \text{ km/hr} = \left(\frac{60}{10}\right) \text{ hrs} = 6 \text{ hrs.}$$

So, Robert started 6 hours before 2 P.M. i.e., at 8 A.M.

$$\therefore \text{Required speed} = \left(\frac{60}{5}\right) \text{ kmph.} = 12 \text{ kmph.}$$

8-D

Man's rate in still water = $(15 - 2.5) \text{ km/hr} = 12.5 \text{ km/hr.}$

Man's rate against the current = $(12.5 - 2.5) \text{ km/hr} = 10 \text{ km/hr.}$

9-B

$$\text{A's 2 day's work} = \left(\frac{1}{20} \times 2\right) = \frac{1}{10}.$$

$$\text{(A+B+C)'s 1 day's work} = \left(\frac{1}{20} + \frac{1}{30} + \frac{1}{60}\right) = \frac{6}{60} = \frac{1}{10}.$$

$$\text{Work done in 3 days} = \left(\frac{1}{10} + \frac{1}{10}\right) = \frac{1}{5}.$$

Now, $\frac{1}{5}$ work is done in 3 days.

\therefore Whole work will be done in $(3 \times 5) = 15$ days.

10-C

Let the capacity of each = 100 ml

So 300 ml removed and poured into second

First vessel = 200 ml alcohol

Second = 500 ml water+ 300 ml A

Ratio = 5:3

Proportion of alcohol = $\frac{3}{8}$

If 300 ml removed from second = $300 \times \frac{5}{8} = 187.5$ ml water

= 112.5 ml alcohol

Now poured so vessel = $200 + 112.5 = 312.5$ A

= 187.5 ml

Hence ratio = 5:3 proportion of water = $\frac{3}{8}$

So A= B

SET - 8

1-B

$$\text{Diff} = 1920 - 1280 = 640$$

CP lies b/w both SP's

$$\text{CP} = 1280 + \frac{640}{2} = 1600$$

$$\text{New SP} = 1600 \times 1.25 = 2000$$

2-A

$$P\% = \left(\frac{\text{diff}}{\text{SP}} \right) \times 100$$

$$25 = \left(\frac{(20 - x)}{x} \right) \times 100$$

$$x = 16$$

3-C

$$(1!+2!+3!+\dots+4000!)/7$$

$$(1+2-1+3+1+6)/7 = 5$$

4-C

$$A = 3000$$

$$T = 5 \text{ years}$$

$$R = 10\%$$

Interest for 5 years at 10 % rate is equal to the 50 % of P and amount will be 150 % of P
3000 is 150 %

$$3000/150 \times 100 = 2000$$

i.e 100 % is equal to the P which is 2000 Rs .

5-D

Amount after 4 years = 2480 Rs.

Amount after 8 years = 4080 Rs.

Difference = 1600

Because interest is S.I , so it is equal for every year

$$P = A - I$$

$$2480 - 1600 = 880$$

6-B

$$\frac{(1/2)x}{21} + \frac{(1/2)x}{24} = 10$$

$$\Rightarrow \frac{x}{21} + \frac{x}{24} = 20$$

$$\Rightarrow 15x = 168 \times 20$$

$$\Rightarrow x = \left(\frac{168 \times 20}{15} \right) = 224 \text{ km.}$$

7-D

Let the speed of two trains be $7x$ and $8x$ km/hr.

$$\text{Then, } 8x = \left(\frac{400}{4} \right) = 100$$

$$\Rightarrow x = \left(\frac{100}{8} \right) = 12.5$$

\therefore Speed of first train = (7×12.5) km/hr = 87.5 km/hr.

8-A

Given: Speed of train is 116 km/h.

$$\Rightarrow \left(116 \times \frac{5}{18} \right) = \frac{580}{18} \text{ m/s.}$$

The distance covered in 18 Sec. = speed \times time

$$\Rightarrow \frac{580}{18} \times 18 = 580 \text{ meter}$$

9-A

Amount of work P can do in 1 day = $1/20$

Amount of work Q can do in 1 day = $1/30$

Amount of work R can do in 1 day = $1/60$

P is working alone and every third day Q and R is helping him

Work completed in every three days = $2 \times (1/20) + (1/20 + 1/30 + 1/60) = 1/5$

So work completed in 15 days = $5 \times 1/5 = 1$

hence, the work will be done in 15 days

10-C

Part filled by (A+B) in 1 minute = $\left(\frac{1}{60} + \frac{1}{40}\right) = \frac{1}{24}$.

Suppose the tank is filled in x minutes.

$$\text{Then, } \frac{x}{2} \left(\frac{1}{24} + \frac{1}{40}\right) = 1$$

$$\Rightarrow \frac{x}{2} \times \frac{1}{15} = 1$$

$$\Rightarrow x = 30 \text{ min}$$

SET - 9

1-B

We have $\angle A = \angle C = 60^\circ$ (opposite angle of parallelogram are equal)

Let, $\angle CDB = x$

In triangle CDB we have

$CD = BC$ (side of rhombus are equal)

So, $\angle CDB = \angle DBC = x$

therefore, $\angle CDB + \angle DBC + 60^\circ = 180^\circ$

$$2x = 120^\circ$$

$$x = 60^\circ$$

$$\angle CDB = 60^\circ$$

2-D

Let salaries be $4x$ & $7x$

So, $(4x + 25)/(7x + 25) = 3/5$

$$\Rightarrow x = 50$$

$$4 \times 50 : 7 \times 50$$

$$200 : 350$$

$$4 : 7$$

3-D

P.W. = Rs. $(1760 - 160) =$ Rs. 1600. \therefore S.I. on Rs. 1600 at 12% is Rs. 160. \therefore

$$\text{Time} = \left(\frac{100 \times 160}{1600 \times 12} \right) = \frac{5}{6} \text{ years} = \left(\frac{5}{6} \times 12 \right) \text{ months} = 10 \text{ months.}$$

4-C

$$P(\text{Sum } 6) = \frac{5}{36}$$

$$(1, 5), (5, 1), (2, 4), (4, 2), (3, 3)$$

$$P(\text{Sum } 7) = \frac{6}{36} = \frac{1}{6}$$

$$(1, 6), (6, 1), (2, 5), (5, 2), (3, 4), (4, 3)$$

If A represents total of 6 for A, A' represents total which is other than 6, B represents total of 7 for B, and B' represents when it is not 7

A wins when A, A'B'A, A'B'A'B'A,

$$\begin{aligned} \therefore P(\text{A wins}) &= \frac{5}{36} + \frac{31}{36} \times \frac{5}{6} \times \frac{5}{36} + \frac{31}{36} \times \frac{5}{6} \times \frac{31}{36} \times \frac{5}{6} \times \frac{5}{36} + \dots \\ &= \frac{\frac{5}{36}}{1 - \frac{31}{36} \times \frac{5}{6}} = \frac{30}{61} \end{aligned}$$

5-B

$$97 - 7 = 90, \quad 65 - 5 = 60$$

$$\text{HCF of } 90 \text{ and } 60 = 30$$

6-D

$$\text{HCF of } (37 - 23), (79 - 37), (79 - 23)$$

HCF of 14,42 and 56= 14

7-A

4 223

5 55 3
6 11 0
1 5

Remainder= 5

8-D

$5^6 - 5^2$

- ⇒ ---00-25
- ⇒ ---00
- ⇒ Divisible by 100

9-B

Value and Zero of a Polynomial -

If $p(x)$ is a polynomial in x , and if k is any real number, then the value obtained by replacing x by k in $p(x)$, is called the value of $p(x)$ at $x = k$, and is denoted by $p(k)$.

So, If $p(x)$ is a polynomial in the form of : $a_0 + a_1x + a_2x^2 + a_3x^3 + \dots + a_nx^n$ with $a_n \neq 0$, then value of the polynomial $p(x)$ for a real value at $x=k$ will be given by $p(k) = a_0 + a_1 \times (k) + a_2 \times (k)^2 + a_3 \times (k)^3 + \dots + a_n \times (k)^n$.

For example, consider the polynomial $p(x) = x^2 - 3x - 4$. Then the value of $p(2)$ will be -6. (How?)

Value is obtained by replacing x by 2 in the expression $x^2 - 3x - 4$,

Another example:

Let $p(x) = 2x^2 - 3x + 5$. Then,

$$p(2) = \{2 \times 2^2 - 3 \times 2 + 5\} = (8 - 6 + 5) = 7$$

$$p(-1) = \{2 \times (-1)^2 - 3 \times (-1) + 5\} = (2 + 3 + 5) = 10$$

-

$$p(2) = 2 \times 2 - 2 \times 2 - 3 = -3$$

10-D

LCM of 8,11,24=264

$$\text{Number} = 264 \cdot a + 5$$

$$A = 37 + 1 = 38$$

$$\text{Number} = 264 \cdot 38 + 5 = 10037$$

SET - 10**1-A**

Let the cost price of the article be Rs. x .

According to the given conditions:

$$\Rightarrow 78 - x = 2(69 - x)$$

$$\Rightarrow 78 - x = 138 - 2x$$

$$\Rightarrow x = 60$$

Hence, the correct answer is Rs. 60.

2-C

Let the cost price be Rs. x .

$$\text{Profit} = \text{Selling price} - \text{Cost price} = 524 - x$$

$$\text{Loss} = \text{Cost price} - \text{Selling price} = x - 452$$

According to the question,

$$524 - x = x - 452$$

$$\Rightarrow 2x = 976$$

$$\Rightarrow x = 488$$

Hence, the correct answer is Rs. 488.

3-D

Let the numbers be $3x$ and $6x$.

According to the question,

$$\frac{3x + 6}{5x + 6} = \frac{2}{3}$$

$$\Rightarrow 9x + 18 = 10x + 12$$

$$\Rightarrow x = 6$$

Therefore, the numbers are $(3 \times 6) = 18$ and $(5 \times 6) = 30$

Hence, the correct answer is 18 and 30.

4-A

Let the ratio of 2nd : 3rd = 9 : 13

And the ratio of 1st : 3rd = 2 : 7

3rd number is common in both ratio, so to make the value equal, we need to multiply by 7 in 9 : 13 and by 13 in 2 : 7.

We get, 1st : 2nd : 3rd = 26 : 63 : 91

Let the 1st, 2nd and 3rd number be 26x, 63x and 91x.

According to the question,

$$26x + 63x + 91x = 540$$

$$\Rightarrow 180x = 540$$

$$\Rightarrow x = 3$$

Thus, the 3rd number be (91 \times 3) = 273

Hence, the correct answer is 273.

5-C

The mixture of A, B and C, according to the capacities of the boxes they were in, is in a ratio of 24 : 36 : 84 = 2 : 3 : 7

$$\text{Part of A is } \frac{2}{2+3+7} = \frac{2}{12}$$

According to the capacity of the third box, the amount of type A wheat in the third box

$$= \frac{2}{12} \times 84 = 14 \text{ kg}$$

Hence, the correct answer is 14 kg.

6-D

Speed = 2 m/sec.

$$\text{Converting m/sec to km/hr} = 2 \times \frac{18}{5} = 7.2 \text{ km/hr.}$$

7-D

Distance = (240 x 5) = 1200 km.

Speed = 1200/(5/3) km/hr.

$$\therefore \text{ Requierd Speed} = 1200 \times \frac{18}{5} = 720 \text{ km/hr}$$

8-A

Let the speed of boat in still water be a km/hour and speed of water be b km/hour.

As per first given condition:

$$\Rightarrow \frac{4}{(a-b)} + \frac{4}{(a+b)} = 1$$

Let $\frac{1}{(a-b)} = x$ and $\frac{1}{(a+b)} = y$

$$\Rightarrow 4x + 4y = 1$$

$$\Rightarrow x + y = \frac{1}{4} \text{ ----(1)}$$

As per second given condition:

$$\Rightarrow \frac{3}{(a-b)} + \frac{5}{(a+b)} = \frac{55}{60}$$

$$\Rightarrow 3x + 5y = \frac{11}{12}$$

By putting the value of y from equation (1) we get:

$$\Rightarrow 3x + 5\left(\frac{1}{4} - x\right) = \frac{11}{12}$$

$$\Rightarrow 2x = \frac{5}{4} - \frac{11}{12}$$

$$\Rightarrow x = \frac{1}{6} \Rightarrow (a-b) = 6 \text{ ----(2)}$$

By putting the value of x in equation (1)

$$\Rightarrow y = \frac{1}{4} - \frac{1}{6}$$

$$\Rightarrow y = \frac{1}{12} \Rightarrow (a+b) = 12 \text{ ----(3)}$$

From equation 2 and 3,

$$\Rightarrow 2a = 18 \Rightarrow a = 9$$

So, the speed of boat in still water is 9.

9-A

work done by A in 1 day = $1/18$

Number of days A work = $2+4=6$ therefore, total work done by A = $6 \times 1/18 = 1/3$

The remaining $2/3$ work is done by B in 4 days and hence complete work done by B will be

$$4 \times (3/2) = 6 \text{ days.}$$

10-B

H: W

H: W

1: 3

3: 1



2 gallon



3 gallon

$1/2, 3/2$

$9/4, 3/4$

Ratio = $1/2 + 9/4: 3/2 + 3/4$

$11/4: 9/4$

11:9

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