CHAPTER - 7

I)   5 × 2 = 10

1) The slant height of a frustum of a cone is 5cm and the radii of its end are 4cm and 1cm. Find its curved surface area

2) The volume of two cones of same base radius are 3600 cm³ and 5040 cm³. Find ratio of height

3) A conical flask is full of water. The flask has base radius r units and heights h units. The water is poured into flask of base radius xr units. Find the height of water in the cylindrical flask

4) Find the maximum volume of a cone that can be carved out of a solid hemisphere of radius r units

5) Find the diameter of a sphere whose surface area is 154 m² [compulsory]

II)   3 × 5 = 15

1) The internal and external diameters of a hollow hemispherical vessel are 20cm and 28cm. Find the cost to paint the vessel all over ₹0.14/cm²

2) A right circular cylinder container of base radius 6cm and height 15cm is full of ice cream. The ice cream is to be filled in cones of height 9cm and base radius 3cm having hemispherical cap. Find the no. of cones needed to empty the container

3) A hemispherical hollow bowl has material of volume 436π/3 cubic cm. External diameter 14cm. Find its Thickness [compulsory]

III)   1 × 8 = 8

1) Draw a tangent at any point R on the circle of radius 3.4 cm and centre at P?

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CHAPTER - 8

I)   5 × 2 = 10

1) Two coins are tossed together. What is the probability of getting different faces on the coins?

2) If the range of the smallest value of a set of data are 36.8 and 13.4. then find the largest value

3) The mean of a data is 25.6 and its coefficient of variation is 18.75. Find the standard deviation

4) A and B are two events such that P(A) = 0.42, P(B) = 0.48, P(A∩B) = 0.16. Find i) P(not A) ii) P(A or B)

5) If two dice are rolled, then find the probability of getting product of face value 6 or the difference of face values 5 [compulsory]

II)   3 × 5 = 15

1) A card is drawn from a pack of 52 cards. Find the probability of getting king or a heart or red card

2) Find the mean and variance of the first n natural numbers

3) Prove Addition Theorem of probability.
   i) If A and B are any two events then
   $$P(A \cup B) = P(A) + P(B) + P(A \cap B)$$
   ii) If A and B and C are three events then
   $$P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(B \cap C) - P(A \cap C) + P(A \cap B \cap C)$$
   [compulsory]

III)   1 × 8 = 8

1) Draw the graph of $x^2 + x - 12 = 0$

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CHAPTER - 5

I)   5 × 2 = 10

1) Find the area of the triangle formed by the points $(-10, 4)$ $(-8, -1)$ and $(-3, -5)$

2) Without using Pythagoras theorem, show that the points $(1, -4)$ $(2, -3)$ $(4, -7)$ form a right angle triangle

3) Find the equation of a line passing through the points $(3, -4)$ and having slope $-5/7$

4) Find the equation of the perpendicular bisector of the line joining the points $A(-4, 2)$ and $B(6, -4)$

5) Show that the straight lines $x - 2y + 3 = 0$ and $6x + 3y + 8 = 0$ are perpendicular [compulsory]

II)   3 × 5 = 15

1) Find the equation of a straight line parallel to Y axis and passing through the point of intersection of the lines $4x + 5y = 13$ and $x - 8y + 9 = 0$

2) A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through $(-3, 8)$. Find its equation

3) Find the area of the quadrilateral whose vertices are at $(-9, 0)$ $(-8, 6)$ $(-1, -2)$ and $(-6, -3)$

III)   1 × 8 = 8

1) Draw a tangent to the circle from the point P having radius 3.6 cm and centre at O. Point P is at a distance 7.2 cm from the centre

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CHAPTER - 6

I)   5 × 2 = 10

1) If $\csc\theta + \cot\theta = P$, prove that $\cos\theta = \frac{P^2 - 1}{P^2 + 1}$

2) A kite is flying at a height of 75m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with a ground is 60°. Find the length of the string, assuming that there is no slack on the string

3) From the top of a rock $50\sqrt{3}$m high, the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock

4) If $a\cos\theta - b\sin\theta = c$, then prove that $(a\sin\theta + b\cos\theta) = \pm\sqrt{a^2 + b^2 - c^2}$

5) Prove the identity $\sin^2\theta + \cos^2\theta = 1$ [compulsory]

II)   3 × 5 = 15

1) A pole 5m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point 'A' on the ground is 60° and the angle of depression to the point 'A' from the top of tower is 45°. Find the height of tower

2) To a man standing outside his house, the angle of elevation of top and bottom of window 60° and 45° respectively. If the height of man is 180 cm and if he is 5m away from the wall, what is height of window

3) If $\frac{\cos^3\theta}{\sin\theta} = p$ and $\frac{\sin^3\theta}{\cos\theta} = q$. Prove $p^3q^3(p^3 + q^3 + 3) = 1$ [compulsory]

III)   1 × 8 = 8

1) Draw a graph of $y = 2x^2$ and hence solve $2x^2 - x - 6 = 0$

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CHAPTER - 3

I)   5×2 =10

1) Solve $3x+y-3z=1$; $-2x-y+2z=1$; $-x-y+z=2$

2) Find the LCM of $8x^4y^2$, $48x^2y^4$

3) Find the excluded values i) $\frac{x+10}{8x}$ ii) $\frac{x}{x^2+1}$

4) Solve $x^2-3x-2=0$

⑤ Are x^2-1 and $\tan x = \frac{\sin x}{\cos x}$ rational expression?
[compulsory]

II)   3×5 =10

1) If $x = \frac{a^2+3a-4}{3a^2-3}$ and $y = \frac{a^2+2a-8}{2a^2-2a-4}$ find the value of x^2y^{-2}

② The hypotenuse of a right angled triangle is 25cm and its perimeter 56cm. Find the length of the smallest side [compulsory]

3) Find the square root of $64x^4-16x^3+17x^2-2x+1$

III)   1×8 =8

1) Construct a ΔPQR in which $QR = 5cm$. $\angle P = 40°$ and the median PG from P to QR is 4.4cm. Find the length of the altitude from P to QR

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CHAPTER - 4

I)   5×2 =10

1) If ΔABC is similar to ΔDEF such that BC = 3cm EF = 4cm and area of $\Delta ABC = 54 cm^2$ Find area of ΔDEF.

2) What length of ladder is needed to reach a height of 7ft along the wall when the base of the ladder is 4ft from the wall? Round off your answer to the next tenth

3) show that the angle bisector of triangles are concurrent

4) The length of the two tangents drawn from an exterior point to a circle are equal. Give proof

⑤ Explain Ceva's theorem [compulsory]

II)   3×5 =15

1) An aeroplane after take off from an airport and flies due north at a speed of 1000 km/hr. At the same time, another plane take off from the same airport and flies due west at a speed of 1200 km/hr How far apart will be the two plane after 1½ hours?.

2) show that in a triangle, medians are concurrent

3) Prove Angle Bisector Theorem [compulsory]

III)   1×8 =8

1) Draw the graph of $y=x^2+4x+3$ and hence find the roots of $x^2+x+1=0$

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X - MATHEMATICS

CHAPTER - 1

I) $5 \times 2 = 10$

1) If $A \times B = \{(3,2)(3,4)(5,2)(5,4)\}$ then find A and B?

2) A relation R is given by the set $\{(x,y)/y = x+3,\ x \in \{0,1,2,3,4,5\}\}$. Determine its domain and Range?

3) Let $A = \{-1,1\}$ and $B = \{0,2\}$ If the function $f:A \to B$ defined by $f(x) = ax+b$ is onto function? Find a and b

4) Find k if $fof(k) = 5$ where $f(k) = 2k-1$

⑤ If the ordered pairs $(a+2, 4)$ and $(5, 2a+b)$ are equal. Find a and b. [compulsory]

II) $3 \times 5 = 15$

1) $A = \{1,2,3\}$ $B = \{2,3,5\}$ $C = \{3,4\}$ and $D = \{1,3,5\}$ check if $(A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$ is true?

② If the function $f:R \to R$ is defined by $f(x) = \begin{cases} 2x+7 & ; x < -2 \\ x^2-2 & ; -2 \le x < 3 \\ 3x-2 & ; x \ge 3 \end{cases}$

i) $f(4)$ ii) $f(-2)$ iii) $f(4) + 2f(1)$ iv) $\dfrac{f(1) - 3f(4)}{f(-3)}$ [compulsory]

③ If $f(x) = 2x-1$, $g(x) = \dfrac{x+1}{2}$ show that $fog = gof = x$

III) $1 \times 8 = 8$

1) Draw a triangle ABC of base BC = 8cm. $\angle A = 60°$ and bisector of $\angle A$ meets BC at D such that BD = 6cm

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CHAPTER - 2

I) $5 \times 2 = 10$

1) a and b are two positive integers such that $a^b \times b^a = 800$ Find a and b

2) Determine the general term of an A.P whose 4th term is -1 and 16th term is 17

3) Find the sum of all positive integers less than 450

4) Find the 10th term of a G.P whose 8th term is 768 and the common ratio is 2

⑤ Find the rational form of the number $\overline{0.123}$ [compulsory]

II) $3 \times 5 = 15$

1) If d is the highest common factor of 32 and 60 find x and y satisfying $d = 32x + 60y$

2) If l^{th}, m^{th} and n^{th} term of an A.P are x,y,z respectively. then show that
i) $x(m-n) + y(n-l) + z(l-m) = 0$ ii) $(x-y)n + (y-z)l + (z-x)m = 0$

③ A man saved ₹16500 in the years. In each year after the first year he saved ₹100 more than he did in the preceding year. How much he save in 1st year [compulsory]

III) $1 \times 8 = 8$

1) Draw the graph of $xy = 24$, $x,y > 0$. using the graph find i) y when x = 3 ii) x when y = 6

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