

Instructions :

1. Answer all the questions in a separate answer booklet.
2. The question paper consists of 4 sections and 33 questions.
3. There is internal choice in Section – IV.
4. Write answers neatly and legibly

Section - I

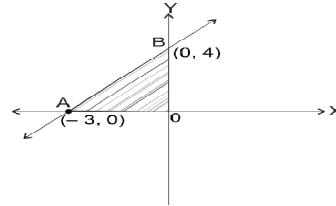
Note :-1. Answer all the Questions in one WORD or PHRASE

2. Each Question carries 1 Mar

$$12 \times 1 = 12$$

1. What is the value of $\log_{\frac{2}{3}} \frac{27}{8}$
2. Write a quadratic equation with roots 3 and 4.
3. If $A = \{1, 2, 3\}$ and $\phi = \{ \}$, find $A \cap \phi$
4. The perimeters of two similar triangles are 24 cm and 18 cm respectively. If one side of the first triangle is 8 cm then what is the corresponding side of second triangle ?
5. What is the value of $\sec 16^\circ \cdot \operatorname{cosec} 74^\circ - \cot 74^\circ \cdot \tan 16^\circ$
6. Choose the correct answer satisfying the following statements
Statement (A) : The ratio of volumes of cone and cylinder of same base and same height is 3 : 1
Statement (B) : The ratio of volumes of sphere and cone of same radius and same height is 2 : 1
i) Both A and B are true ii) A is true, B is false iii) A is false, B is true
iv) Both A and B are false
- 7 .A tower of height 100 m casts a shadow of length $100\sqrt{3}$ m then what is the angle of elevation of the sun at that time ?
- 8 .A card is drawn from a well shuffled deck of 52 cards randomly. What is the probability of getting a card, which is neither an ace nor a king card ?
- 9 .The length of the minutes hand of a clock is 7c.m then how much distance does it cover in one hour ?

10. Find the area of the shaded triangle, in the given adjacent figure



11. If α, β, γ are the zeroes of the polynomial $px^3 + qx^2 + rx + s$ then, which of the following matching is correct ?

A) $\alpha + \beta + \gamma$ (ii) i) $-\frac{s}{p}$

B) $\alpha\beta + \beta\gamma + \gamma\alpha =$ (iii) ii) $-\frac{q}{p}$

C) $\alpha\beta\gamma$ (i) iii) $\frac{r}{p}$

a) A(i), B(ii), C(iii) b) A(ii), B(iii), C(i) c) A(iii), B(i), C(ii) d) A(ii), B(i), C(iii)

12. Draw the rough graph of the linear equation $x = -2$.

Section – II

Note : 1. Answer all the questions.

2. Each Question carries 2Mark.

8 × 2 = 16

13 . Simplify $\cot^2\theta - \frac{1}{\sin^2\theta}$

14 Find the centroid of a triangle, whose vertices are (6, 2), (0, 0) and (4, - 5).

15 A bag contains 5 red, 5 green and 5 white balls of the same size. A ball is drawn at random from the bag. Is the probability of picking up a ball of any colour equally likely or not? Justify

16 Given $A = \{x : x \text{ is an even number less than } 10\}$, $B = \{x : x \text{ is a prime number less than } 10\}$ find $A \cap B$

17 Find the discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$

18 Find the sum of first 51 terms of an AP whose second and third terms are 14 and 18 respectively.

19 . Reduce the pair of equations $\frac{2}{x} + \frac{3}{y} = 13$ and $\frac{5}{x} + \frac{4}{y} = -2$, ($x \neq 0, y \neq 0$) into a pair of linear equations in two variables 'a' and 'b'.

20 Draw a diagram to find the height of the kite in the situation given below. "A

person is flying a kite at an angle of elevation ' α ' and the length of thread from his hand to kite is 'l'.

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Section - III

Note : 1. Answer all the questions.

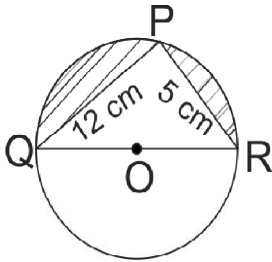
2. Each Question carries 4 Marks.

$$8 \times 4 = 32$$

21. Find the mean of the following data

x_i	5	8	10	15	18	20
f_i	2	3	5	4	4	2

22. Find the area of the segment shaded in the figure in which $PQ = 12\text{cm}$, $PR = 5\text{cm}$ and QR is the diameter of the circle with center 'O'



23. Two digit numbers are formed by the digits 0, 1, 2, 3, 4, where the digits are not repeated. Find the probability that i) the number formed is greater than 42. ii) the number formed is a multiple of 4

24. Write the quadratic polynomial, whose sum of zeroes is -3 and sum of the squares of zeroes is 17.

25. The diagonal of a rectangular field is 60m more than its breadth. If the length is 30 m more than its breadth, find the dimensions of the field.

26. A fraction becomes $\frac{4}{5}$ if 1 is added to both numerator and denominator. If, however, 5 is subtracted from both numerator and denominator, the fraction becomes $\frac{1}{2}$. What is the fraction?

27. The length, breadth and height of a cuboid are $(\log 125 + \log 8)$, $(\log 1000 - \log 10)$ and $\log 10$ respectively. Find the total surface area of the cuboid

28. Draw a circle of radius 3cm, mark a point 'P' on the circle and draw a tangent at 'P'

Section-iv

Note : 1. Answer all the questions.

2. Each Question carries 8 Marks.

3. There is an internal choice for each question $5 \times 8 = 40$

29(A)	If $\cot \theta = \frac{7}{8}$ then Evaluate (i) $\frac{(1 + \sin \theta)(1 - \sin \theta)}{(1 + \cos \theta)(1 - \cos \theta)}$ (ii) $\frac{1 + \cos \theta}{\sin \theta}$
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29.(B) If the Geometric Progressions 162, 54, 18 and $\frac{2}{81}, \frac{2}{27}, \frac{2}{9}, \dots, \dots$

have their n th terms equal then find the value of ' n '.

30(A). The following table shows the daily expenditure on grocery of 25 House holds in a locality. Find the 'Mode' value of daily Expenditure on grocery

Daily expenditure	100-150	150-200	200-250	250-300	300-350
No.of house holders	4	5	12	2	2

30.(B) A toy top is in the form of a cone mounted on a hemi-sphere. The diameter of the base and the height of the cone are 6 cm and 4 cm respectively, Determine the surface area of the toy. (Take $\pi = 3.14$)

31(A) Prove that $\sqrt{5} + \sqrt{7}$ is an irrational number.

31(B). Show that the given points (1,7), (4,2), (-1, -1), and (-4, 4) are the vertices of a square and find its area.

32(A). If $A = \{x / x \in W, x < 10\}$, $B = \{x/x \text{ is a factor of } 10\}$,

$C = \{1^2, 2^2, 3^2, \dots, 10^2\}$, then Find i) $A \cup B$ ii) $A \cap B$ iii) $A - C$ iv) $B - C$

32(B). A man on the top of vertical tower observes a car moving at a uniform speed coming directly towards it. If it takes 12 seconds to change the angle of depression from 30° to 60° , then how long will the car take to reach the tower from that point.

33(A). Draw the graph of $y = x^2 - x - 6$ and find zeroes

33(B). Draw ΔABC with sides 4.3 cm, 5.2 cm, 6.5 cm and then construction a triangle similar to ΔABC , whose sides are $\frac{3}{5}$ th of the corresponding sides.
