

Time allowed: **3 hours**; Maximum marks: **90**

General Instructions:

- All Questions are compulsory
- The Question Paper consists of 35 Questions divided in to four sections A, B, C and D
- Section- A comprises of 10 questions of one mark each
- Section- B comprises of 10 questions of two mark each
- Section- C comprises of 10 questions of three mark each
- Section- D comprises of 5 questions of Six mark each
- The use of calculator is not permitted.

Section-A

- The HCF of 29029 and 1740 is ____.
A. 25 B. 30 C. 29 D. 15
- 56 in the decimal form is ____.
A. 0.85⁻ B. 0.83⁻ C. 0.56⁻ D. 0.83
- The quadratic polynomial, whose sum and product of the zeroes are - 1 4 and 1 4 respectively is ____.
A. $f(x) = 4x^2 + x - 1$ B. $f(x) = 4x^2 - x + 1$
C. $f(x) = 3x^2 + x + 1$ D. $f(x) = 4x^2 + x + 1$
- If $4x - 3y = 1$ and $x + 2y = 3$, then $x + y =$ ____.
A. 1 B. 3 C. 2 D. 4
- $\triangle ABC \sim \triangle DEF$ and their areas are 64 cm^2 and 121 cm^2 respectively. If $EF = 15.4 \text{ cm}$, then the length of $BC =$ ____.
A. 14.2 cm B. 13.2 cm C. 12.2 cm D. 11.2 cm
- Each equal side of an isosceles right triangle measures 4 cm. The length of the hypotenuse is ____.
A. 4 cm B. 4 2 cm C. 16 cm D. 8 cm
- If $\sin A = \frac{3}{4}$, then the values of $\cos A$ and $\tan A$ are ____.
A. $\frac{\sqrt{7}}{4}$ and $\frac{3}{\sqrt{7}}$ B. $\frac{\sqrt{7}}{2}$ and $\frac{4}{\sqrt{7}}$
C. $\frac{4}{\sqrt{7}}$ and $\frac{1}{\sqrt{3}}$ D. $\frac{1}{3}$ and $\frac{3}{\sqrt{7}}$

8. $2\cot(90-A)/1+\cot^2(90+A)=$ ____.
- A. $2\cos A/\tan A$ B. $3\sin A/\sin 2A$ C. $2\tan A/1+\tan^2 A$ D. $2\operatorname{cosec} A/1+\tan A$
9. The measure of the central tendency represented by the abscissa of the point where less than ogive and more than ogive intersect is called ____.
- A. mean B. mode C. median D. range
10. The mean of the first five odd numbers is ____.
- A. 5 B. 4 C. 6 D. 7

Section - B

11. The product of two numbers is 6912 and their HCF is 24. Then Find the LCM?
12. Find the factors of x^3-x^2-4x+4 ?
13. "A number when divided by another gives quotient 9 and remainder 6". If the dividend is x and divisor is y, find the linear equation?
14. If P and Q are the midpoints of sides CA and CB respectively of a ΔABC right angled at C, then show that $4BP^2=4BC^2+AC^2$?
15. In the figure below, ΔABD is a right triangle, right-angled at A and $AC \perp BD$. Prove that $AB^2 = BC \cdot BD$?
16. If $\sec^2 \theta (1 + \sin \theta)(1 - \sin \theta) = k$, then find the value of k?
17. Find the value of $\tan 60^\circ$, geometrically?
18. What is the Range? How do you find the range of the following data: 15, 25, 35, 42, 55, 60, 74, 78, 96?
19. The marks of 24 students of a class, obtained in a test (out of 50) are given below: 14, 17, 19, 23, 23, 24, 19, 25, 10, 12, 1, 11, 16, 16, 17, 23, 24, 18, 19, 20, 20, 22, 24, 25. Form a frequency table, with equal class interval, one of them being 0-5?
20. Define median. Write a formula to find out the median of a data?

Section - C

21. The electricity bills (in rupees) of 25 houses in a colony are given below. Construct a frequency distribution table with a class-size of 100. 160, 210, 255, 320, 720, 420, 425, 323, 325, 182, 188, 240, 320, 413, 530, 603, 725, 372, 402, 320, 405, 375, 415, 515, 615.

22. Find the mean of the following data by step deviation method.

Class Interval	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	10	6	8	12	5	9

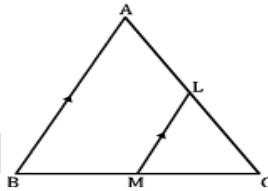
23. The following are the marks obtained by 100 students of class X. Find the median marks.

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60	Below 70	Below 80
No. Of Students	6	20	33	45	65	76	91	100

24. Prove that $\frac{\tan\theta + \sin\theta}{\tan\theta - \sin\theta} = \frac{\sec\theta + 1}{\sec\theta - 1}$?

25. If $\sec\theta + \tan\theta = p$, then show that $\frac{p^2 - 1}{p^2 + 1} = \sin\theta$?

26. In the figure below, $LM \parallel AB$. If $AL = x - 3$, $AC = 2x$, $BM = x - 2$ and $BC = 2x + 3$. Find the value of 'x'?



27. A ladder 15m long reaches a window that is 9 m above the ground on one side of a street. Keeping its foot at the same point, the ladder is turned to the other side of the street to reach a window 12 m high. Find the width of the street?

28. If $x^4 + x^3 + 8x^2 + ax + b$ is exactly divisible by $x^2 + 1$, then find the value of $a + b$?

29. 37 pens and 53 pencils together cost Rs 320, while 53 pens and 37 pencils together cost Rs 400. Find the cost of a pen and that of a pencil?

30. The HCF and LCM of $p(x)$ and $q(x)$ are $2x(x+1)$ and $12x^2(x+1)(x+2)(x-3)$ respectively. If $p(x) = 6x^3 + 18x^2 + 12x$, then find $q(x)$?

Section-D

31. Prove that $\frac{\sin \theta + 1 - \cos \theta}{\cos \theta - 1 + \sin \theta} = \frac{1 + \sin \theta}{\cos \theta}$?
32. Prove that $\frac{1 - \sin \theta}{1 + \sin \theta} = (\sec \theta - \tan \theta)^2$?
33. In ΔPQR , if $QM \perp PR$ and $PR^2 - PQ^2 = QR^2$, then prove that $QM^2 = PM \times MR$?
34. If α , β and γ are the zeroes of the polynomial $x^3 + 3x^2 - 2x - 6$, then find the value of $\alpha^2 + \beta^2 + \gamma^2$?
35. Prove that $5 - 3$ is an irrational number?