

Sig. of Supdt.

KT-X-14(A)
MATHEMATICS - (10th)
 (Fresh / Re-appear)

Roll No.

Fig. No.....

Fig. No.....

Time Allowed : 3 Hrs.

Total Marks : 75

Note: There are three sections of this paper, A, B, & C. Carefully read the instructions for each section and attempt accordingly. Attempt all questions of Section - (A) and return it to the superintendent within the given time.

Time Allowed : 20 Mins.

SECTION - A

Total Marks : 15

Note: Use this sheet for this section. No. mark will be awarded for cutting, erasing or over writing.

Q. 1 Insert the correct option (a, b, c, d) in the empty box opposite to each part. Each part carries one mark. Any kind of Mark Left / Written is strictly prohibited. Mobile Phone is strictly prohibited in Examination Hall.

- i) The sum of $x - 1$ and the reciprocal of $x + 1$ is
- (a) $\frac{x^2}{x+1}$ (b) $\frac{x+1}{x-1}$ (c) $\frac{x}{x+1}$ (d) $\frac{x-1}{x+1}$
- ii) If $2^x = \frac{1}{2}$ then $x =$
- (a) $\frac{1}{2}$ (b) 2 (c) -4 (d) 1
- iii) If α, β are the roots of the equation $3x^2 + 5x + 8 = 0$ then $\alpha\beta =$
- (a) $\frac{8}{3}$ (b) $-\frac{8}{3}$ (c) $\frac{5}{3}$ (d) $-\frac{5}{3}$
- iv) The sum of the complex cube roots of unity is
- (a) -1 (b) 0 (c) 1 (d) W
- v) The third proportion of a^2, b^2 and abc is
- (a) a^2 (b) b^2 (c) $a^2b^2c^2$ (d) c^2
- vi) Direct variation between a and b is expressed as
- (a) $a = b$ (b) $a \propto b$ (c) $a \propto \frac{1}{b}$ (d) $a = \frac{1}{b}$
- vii) $\frac{x}{x+3}$ is
- (a) Improper fraction (b) Irrational fraction
 (c) Proper fraction (d) None of these
- viii) If $A = \{1, 2\}$, $B = \{3\}$ and "f" is a function from A to B defined by $f = \{(1, 3), (2, 3)\}$ then f is called
- (a) Surjective (b) Injective (c) Bijective (d) None of these
- ix) $(A \cap B)'$ =
- (a) $A' \cup B'$ (b) $A \cap B'$ (c) $A \cap B$ (d) $A \cup B$
- x) In data 5, 7, 7, 5, 3, 7, 2, 8, 2 mode is
- (a) 9 (b) 2 (c) 5 (d) 7
- xi) $\cos^2 \theta + \sin^2 \theta =$
- (a) -1 (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{\sqrt{2}}$ (d) 1
- xii) If $\cos \theta > 0$ and $\operatorname{cosec} \theta < 0$ then θ lies in
- (a) 4th quadrant (b) 2nd quadrant (c) 3rd quadrant (d) 1st quadrant
- xiii) The central angle of minor arc of a circle is 36° , the angle subtended by the corresponding major arc is
- (a) 18° (b) 54° (c) 72° (d) 144°
- xiv) The term shows how often a value appear
- (a) Frequency (b) Mean (c) Class limit (d) Class boundary
- xv) A circle which touches all the three sides of triangle is called
- (a) Escribed circle (b) Inscribed circle (c) Circumscribed circle (d) None of these

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Time Allowed : 2:40 Hrs.

Section – B

Marks : 36

Q. 2 Write a short answer of any NINE of the following parts. Each part carries equal marks.

- (i) Solve $(x - 3)^2 = 4$ by factorization.
- (ii) Solve $\sqrt{x+7} + \sqrt{x+2} = \sqrt{6x+13}$
- (iii) Evaluate $w^{12} + w^{58} + w^{95}$
- (iv) The sum of the squares of two numbers is 100. One number is 2 more than the other, find the numbers.
- (v) If $\gamma \propto \frac{1}{P^3}$ and $P = 9$ when $\gamma = 2$. Find γ when $P = 3$
- (vi) The mean proportion between two numbers is 6 and their product is 13. Find the numbers?
- (vii) The arc of a circle subtends an angle of 30° at the centre. The radius of circle are 5cm. find area of the sector formed.
- (viii) Prove that $\cos^2\theta - \sin^2\theta = 2\cos^2\theta - 1$
- (ix) If $U = \{1, 2, 3, 4, 5, 6\}$, $A = \{2, 3\}$, $B = \{3, 4, 5\}$ prove that $(A \cap B)' = A' \cup B'$
- (x) If $A = \{1, 2, 3\}$, $B = \{4, 5\}$ then find 4 binary relations from B to A.
- (xi) Using assumed mean of 505, find the mean of six numbers.
501, 503, 505, 506, 508, 513
- (xii) Resolve $\frac{3x+2}{x^2-x-2}$ into partial fractions.

Section – C

Marks : 24

NOTE : Attempt any three questions. Each question carries equal marks.

- Q. 3 Prove that a straight line drawn from the centre of a circle to bisect a chord (which is not a diameter) is perpendicular to the chord.
- Q. 4 Prove that the angle in a semicircle is a right angle.
- Q. 5 Construct a triangle whose sides are 3cm, 4cm and 6cm respectively. Draw its inscribed circle.
- Q. 6 Inscribe a square of side 10cm in a circle.