

1	1
2	2
3	3

Note: There are THREE sections in this paper i.e. A, B & C. Attempt Section-A and return it to the Superintendent within the given time. No marks will be awarded for cutting, erasing and overwriting.

Time: 20 minutes

Section-A

Marks: 15

QNo.1' Select the correct option and shade (A,B,C,D) in the given bubble answer sheet.

- i. If ω is the cubic root of unity, then $\omega^2 =$ _____.
- A- $1 + \omega$ B- $-1 - \omega$ C- ω D- $-\omega$
- ii. If a, b, and c are continued proportion, i.e. $\frac{a}{b} = \frac{b}{c}$, then _____.
- A- $ab = c^2$ B- $ab = bc$ C- $a^2 = bc$ D- $ac = b^2$
- iii. If $x \propto y$ and $y = 27$, when $x = 3$. Find y, when $x = 11$.
- A- 99 B- 27 C- 80 D- 88
- iv. $\frac{x^2 + 2}{x^2 + 2x + 2}$ is _____ fraction.
- A- Proper irrational B- Proper rational C- Irrational D- Improper rational
- v. The set $\{0, 1, 2, 3, \dots\}$ is a set of _____.
- A- Natural numbers B- Prime numbers C- Integers D- Whole numbers
- vi. If $R = \{(a, 2), (b, 3), (c, 3)\}$, then $\text{Dom } R =$ _____.
- A- $\{1, 2\}$ B- $\{a, b, c\}$ C- $\{1, 2, 3\}$ D- $\{a, c\}$
- vii. The most frequent number of a set of data is called _____ of a data.
- A- Mean B- Median C- Mode D- Range
- viii. In a set of data 63, 65, 66, 67, 69, Median is _____.
- A- 63 B- 66 C- 67 D- 69
- ix. $120^\circ =$ _____ radians.
- A- $\frac{\pi}{3}$ B- $\frac{\pi}{6}$ C- $\frac{2\pi}{3}$ D- $\frac{3\pi}{4}$
- x. $1 - \cos^2\theta =$ _____.
- A- $\sec^2\theta$ B- $\sin^2\theta$ C- $\text{cosec}^2\theta$ D- $\tan^2\theta$
- xi. A line segment having both end points on a circle and not passing through the centre is called _____.
- A- Chord B- Secant C- Diameter D- Radius
- xii. A line which is perpendicular to a radial segment of a circle at its outer end is called _____.
- A- Secant B- Tangent C- Chord D- Diameter
- xiii. The angle in a major segment of a circle is _____.
- A- Less than 45° B- Less than 90° C- Between 90° and 135° D- Greater than 135°
- xiv. If $x^2 + x - 1 = 3$, then the value of $(1 - x - x^2)$ is equal to _____.
- A- -2 B- +1 C- +3 D- 3
- xv. If discriminant of a quadratic equation is zero, then the root will be _____.
- A- Rational and equal B- Irrational and equal C- Rational and unequal D- Irrational and unequal

Note: Time allowed 2:40 hours

SECTION - B

Marks: 36

Q2: Answer any NINE parts. Each part carries equal marks.

- i. Solve $\frac{2}{3} - \frac{1}{12} = \frac{1}{24}$ by Quadratic formula.
- ii. Solve $\sqrt{29-4} = 2 + 3$.
- iii. For what value of K, the roots of the equation $Kx^2 + 2x + 1 = 0$ are real.
- iv. Evaluate $(1 + 3\omega + \omega^2)(1 + \omega - 2\omega^2)$.
- v. Show that -1 and 2 are roots of the equation $x^4 - 5x^3 + 3x^2 + 7x - 2 = 0$. Use synthetic division to find other roots.
- vi. If $y \propto x$, when $x = 4$, $y = 2$, then find
(i) y when $x = 6$ (ii) x , when $y = 3.5$
- vii. If $10 : 25 : x$ are in continued proportion, find the value of x .
- viii. Express $\frac{2x^2 + 5x - 6}{x+1}$ as sum of polynomial and proper rational fraction.
- ix. If $A = \{3, 4, 5\}$, $B = \{5, 6, 7\}$ and $C = \{8, 9, 10\}$, then show that $(A \cup B) \cup C = A \cup (B \cup C)$
- x. If $x = \{1, 2, 3, 4\}$ and $y = \{5, 6, 7, 8\}$, then write:
(i) a function from x to y
(ii) a one-one function from x to y
- xi. Convert $39^\circ 48' 55''$ to decimal form.
- xii. Show that $\cos^2\theta - \sin^2\theta = 2\cos^2\theta - 1$.

SECTION - C

Marks: 24

Note: Attempt any THREE of the following questions. All questions carry equal marks.

- Q3. If two chords of a circle are congruent then they will be equidistant from the centre.
- Q4. If a line is drawn perpendicular to a radial segment of a circle at its outer end point, it is tangent to the circle at that point.
- Q5. Equal chords of a circle subtend equal angles at the centre.
- Q6. Circumscribe a square about a circle of radius 5cm.