

MATHEMATICS
(SCIENCE GROUP)
CLASS -X

64

Total Time: 3 hour

Max. Marks: 100

General Instructions:

Section 'A': It consists of 20 Multiple choice questions (MCQs) and all of them are to be answered.

Section 'B': It comprises of 05 short answer questions, selecting 2 parts from each question of which 10 questions are to be answered.

Section 'C': It comprises of 5 Descriptive answer questions of which 3 questions are to be answered.

SECTION 'A' MULTIPLE CHOICE QUESTIONS 20

Note:

- (i) Attempt all the questions of this Section.
- (ii) Do not copy down the part questions. Write only the answer against the proper number of the question and its part according to the question paper.
- (iii) Each question carries 1 mark.
- (iv) Write the code of your question paper in **bold letters** in the beginning of the answer script.

1. Choose the correct answer for each question from the given options:-

- (i) $(-3, -2)$ is in quadrant.
☆ 1st ☆ 2nd ☆ 3rd ☆ 4th
- (ii) $(6x^0)^2 = \dots\dots\dots$
☆ 6 ☆ 36 ☆ $6x^2$ ☆ $36x^2$
- (iii) The characteristic of $\log 507.61$ is.....
☆ 1 ☆ 2 ☆ 3 ☆ 4
- (iv) If $a + b = 2$ and $a - b = 2$ the value of $a^2 - b^2$ is
☆ 8 ☆ 6 ☆ 4 ☆ None of these
- (v) The H.C.F. of $x^4 - y^4$ and $x^2 - y^2$ is.....
☆ $x^4 + y^4$ ☆ $(x^2 + y^2)(x^2 - y^2)$ ☆ $x^2 + y^2$ ☆ $x^2 - y^2$
- (vi) Solution set of $\sqrt{y-2} = -4$ is
☆ 18 ☆ ± 4 ☆ $\{ \}$ ☆ None of these
- (vii) If $A = \begin{bmatrix} 5 & 6 \\ 3 & -1 \end{bmatrix}$, then $A^t = \dots\dots\dots$
☆ $\begin{bmatrix} 5 & 3 \\ 6 & -1 \end{bmatrix}$ ☆ $\begin{bmatrix} 5 & 3 \\ -1 & 6 \end{bmatrix}$ ☆ $\begin{bmatrix} 6 & 5 \\ -1 & 3 \end{bmatrix}$ ☆ $\begin{bmatrix} 5 & -1 \\ 3 & 6 \end{bmatrix}$
- (viii) The mean proportion of 75 and 12 are.....
☆ ± 20 ☆ ± 10 ☆ ± 30 ☆ ± 40
- (ix) If the standard deviation of a series is 4, then its variance is:
☆ 20 ☆ 36 ☆ 2 ☆ 16
- (x) The sum of two supplementary angles is:
☆ 90° ☆ 180° ☆ 360° ☆ None of these
- (xi) The distance of any point of a circle from its centre is called its:
☆ Radius ☆ Diameter ☆ Chord ☆ Tangent

- (xii) $\sin 30^\circ = \dots\dots\dots$
 ☆ $\frac{1}{2}$ ☆ $\frac{\sqrt{3}}{2}$ ☆ $\frac{1}{\sqrt{3}}$ ☆ $\sqrt{3}$
- (xiii) $\sqrt[n]{x}$, n is called:
 ☆ radicand ☆ index ☆ power ☆ base
- (xiv) The natural logarithm has the base:
 ☆ π ☆ e ☆ 10 ☆ 0
- (xv) The set all possible subsets of a set is called:
 ☆ Power set ☆ Null set ☆ Improper set ☆ None of these
- (xvi) An angle is less than 90° is called.....angle:
 ☆ obtuse ☆ acute ☆ right ☆ reflex
- (xvii) Additive inverse of $[6 \ -7]$ is:
 ☆ $[-6 \ -7]$ ☆ $[7 \ 6]$ ☆ $[-6 \ 7]$ ☆ None of these
- (xviii) It should be added to $16a^2 + 8ab$ to make it a perfect square:
 ☆ b^2 ☆ $2b^2$ ☆ a^2 ☆ $4b^2$
- (xix) If $(x - 2)(x + 3) = 0$ then $x = \dots\dots\dots$
 ☆ $-2, -3$ ☆ $2, -3$ ☆ $2, -3$ ☆ $-2, 3$
- (xx) $1 + \tan^2 \theta = \dots\dots\dots$
 ☆ $\sec^2 \theta$ ☆ $\operatorname{cosec}^2 \theta$ ☆ $\sin^2 \theta$ ☆ None of these
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MATHEMATICS
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66

Total Time: 2 ½ hours

Max. Marks: 80

Important Instructions:

This paper consisting of Short-Answer Questions (Section 'B') and Descriptive-Answer Questions (Section 'C') is being given after 30 minutes. Its total duration is 2 ½ hours only.

SECTION 'B' (SHORT ANSWER-QUESTIONS) (Marks: 50)

Note: Attempt any **TEN** parts from this section, Selecting two parts from each questions.

2. (i) If $U = \{x | x \in N \wedge x \leq 10\}$, $A = \{2, 4, 6, 8\}$, $B = \{1, 3, 6, 9\}$ Prove that $(A \cup B)' = A' \cap B'$
- (ii) Simplify: $\left[\frac{(125)^2 \times (8)}{(64)^2} \right]^{1/3}$
- (iii) Find the value of $\frac{(85.7) \times (247)}{8.89}$ by using logarithm table.
3. (i) Find the value of $4ab$ if $a + b = -5$ and $a - b = 5$
- (ii) If $A = \begin{bmatrix} 3 & 2 \\ 1 & 0 \end{bmatrix}$ find A^{-1} and verify $A \cdot A^{-1} = I$.
- (iii) What should be added to $4a^4 + 4a^3 + 5a^2 + 2a + 5$ to make it a perfect square?
4. (i) Find the variance if $\bar{x} = 19.5$, $n = 10$, $\sum x^2 = 5555$.
- (ii) Find all the trigonometric ratios of 30° .
- (iii) If two sides of a triangle are congruent the angle opposite to them are also congruent. Prove it.
5. (i) Eliminate 'x' from the Equation $x + \frac{1}{x} = 2p$; $x - \frac{1}{x} = 2q + 1$
- (ii) If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$ show that $(a^2 + c^2 + e^2)(b^2 + d^2 + f^2) = (ab + cd + ef)^2$
- (iii) Find the solution set $-6 + |5x - 3| = 3$
6. (i) Prove that $\frac{\sin \theta}{1 - \cos \theta} = \frac{1 + \cos \theta}{\sin \theta}$
- (ii) Find the factors of $x^2(y - z) + y^2(z - x) + z^2(x - y)$
- (iii) If a perpendicular is drawn from the centre to a chord of a circle, it bisect the chord. Prove it.

SECTION "C" (DESCRIPTIVE-ANSWER QUESTIONS) (Marks: 30)

Note: Attempt any **THREE** questions from this section including Q.7 which is compulsory.

7. In any correspondence of two triangles, if one side and any two angles of one triangle are congruent to the corresponding side and angles of the other, then two triangles are congruent. Prove it.
8. Find the solution set of the following equations graphically(Find four ordered pairs for each equation.
 $3x - 11 = y$; $x - 3y = 9$
9. (i) The sum of three angles of a triangle is equal to 180° . Prove it.
(ii) The perpendicular bisector of a chord of a circle passes through the centre of the circle. Prove it.
10. Factorize the following:
(i) $a^2 - b^2 - 2a + 1$
(ii) $12x^2 - 13x + 3$
(iii) $a^3 + 8b^3 + 27c^3 - 18abc$
(iv) $a^3 - a^2 + 2$
11. Construct a triangle ABC in which $m\overline{AB} = 4$ cm, $m\overline{BC} = 5$ cm, and $m\angle B = 60^\circ$. Draw the circum circle of the triangle and write the steps of construction.