# BOARD OF INTERMEDIATE & SECONDARY EDUCATION, HYDERABAD SINDH

*Excellence – Equity – Empathy*

Time: 2 Hours | **MATHEMATICS MODEL PAPER (CLASS IX)** | Marks: 75

**(Condensed Syllabus)**

## SECTION "A"

## *MULTIPLE CHOICE QUESTIONS (MCQs)*

**Marks 37**

**Q1:** ***Choose the correct answer.***

(i) $\{0,1,2,3,...\}$ is the set of _____ .
(a) Natural numbers (b) Integers (c) Whole numbers (d) Odd numbers

(ii) Set of all real numbers between 1 and 2 is _____ .
(a) Empty set (b) Infinite set (c) Finite set (d) None of these

(iii) $\sqrt{2}$ is _____ .number.
(a) natural (b) even (c) rational (d) irrational

(iv) If $x-\frac{1}{x}=3$ then $x^2+\frac{1}{x^2}=$ _____ .
(a) 7 (b) 9 (c) 11 (d) 15

(v) $x^2+xyz+4$ is a polynomial of degree _____ .
(a) 2 (b) 3 (c) 4 (d) 8

(vi) $y^3+z^3=$ _____ .
(a) $(y-z)(y^2+yz+z^2)$ (b) $(y-z)(y^2+2yz+z^2)$
(c) $(y+z)(y^2+2yz+z^2)$ (d) $(y+z)(y^2-yz+z^2)$

(vii) One and only one _____ can pass through three non-collinear points.
(a) Line (b) Plane (c) Line segment (d) Ray

(viii) Supplement of $70^\circ$ is _____ .
(a) $20^\circ$ (b) $-70^\circ$ (c) $130^\circ$ (d) $110^\circ$

(ix) Which of the following is not a convex set.
(a) Line (b) Line segment (c) Circle (d) Plane

(x) A triangle having no sides congruent , is called _____ triangle .
(a) Isosceles (b) Scalene (c) Equilateral (d) Right

(xi) If a transversal intersects two parallel lines ,the _____ angles are congruent.
(a) Interior (b) Exterior (c) Adjacent (d) Alternate .

(xii) Sum of all angles of a triangle is _____ .
(a) $360^\circ$ (b) $180^\circ$ (c) $90^\circ$ (d) $40^\circ$

(xiii) $(5x-9)(5x+9)=$ _____ .
(a) $5x^2-81$ (b) $5x^2+81$ (c) $25x^2-81$ (d) $25x^2+81$

(xiv) The characteristic of log 56.34 is _____ .
(a) 0 (b) 1 (c) 2 (d) 3

(xv) The natural logarithm has the base _____ .
(a) $\pi$ (b) e (c) 10 (d) 0

(xvi) $(x-y)^3=$ _____ .
(a) $x^3-y^3-3xy$ (b) $x^3+y^3-3xy$
(c) $x^3+y^3-3xy(x-y)$ (d) $x^3-y^3-3xy(x-y)$

(xvii) A parallelogram whose each angle is right angle , is called _____ .
(a) Rhombus (b) Rectangle (c) Trapezoid (d) None of these

(xviii) _____ lines can pass through a point.
(a) Infinite (b) Finite (c) One (d) No

(xix) If $(x+5,1+y)=(7,2)$ then values of x and y are _____ respectively.
(a) 1 and 3 (b) 2 and 1 (c) 2 and -1 (d) none of these

(xx) The point $(-2,7)$ is located in _____ quadrant.
(a) First (b) Second (c) Third (d) Fourth

(xxi) The ordinate of any point on x-axis is always _____.
(a) Non-zero (b) Zero (c) Negative (d) Positive

(xxii) _____ is multiplicative identity in set of real numbers.
(a) 1 (b) 0 (c) -1 (d) None of these

(xxiii) The expression $x^2 \times 5y - 3$ is _____.
(a) Monomial (b) Trinomial (c) Binomial (d) All of these

(xxiv) The H.C.F of $6x^3y^2$ and $4x^2y^3$ is _____.
(a) $6x^3y^3$ (b) $6x^2y^2$ (c) $2x^2y^2$ (d) $4x^2y^2$

(xxv) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ is _____. matrix.
(a) Square (b) Scalar (c) Unit (d) All of these

(xxvi) The matrix A is called --------- matrix if its determinant is zero.
(a) Rectangular (b) Square (c) Singular (d) Non-singular

(xxvii) $(x+y)^2 - (x-y)^2 =$ _____.
(a) $2(x+y)^2$ (b) $x^2 + y^2$ (c) $2(x^2 + y^2)$ (d) 4xy

(xxviii) The order of the matrix $[0 \quad 0]$ is _____.
(a) $0 \times 0$ (b) $1 \times 2$ (c) $2 \times 1$ (d) $1 \times 1$

(xxix) If two adjacent angles are supplementary then their non-common arms are _____.
(a) Coincident (b) Collinear (c) Non-collinear (d) Perpendicular

(xxx) The sum of two complementary angles is equal to _____ degrees.
(a) 90 (b) 180 (c) 360 (d) 100

(xxxi) $\sqrt{3}$ is surd of order _____.
(a) 1 (b) 2 (c) 3 (d) None of these

(xxxii) $\dfrac{\sqrt{256} - \sqrt{144}}{\sqrt{16}} =$ _____.
(a) 10 (b) 5 (c) 1 (d) none of these

(xxxiii) $\sqrt[3]{125} =$ _____.
(a) 50 (b) 25 (c) 15 (d) 5

(xxxiv) Factors of $2x^3 + 2y^3$ are _____.
(a) $(x+y)(x^2 - xy + y^2)$ (b) $2(x+y)(x^2 - xy + y^2)$
(c) $(x-y)(x^2 + xy + y^2)$ (d) $2(x-y)(x^2 + xy + y^2)$

(xxxv) If $\log_2 x = 6$ then $x$ is equal to _____.
(a) 128 (b) 64 (c) 32 (d) 16

(xxxvi) In a right triangle , the acute angles are _____ angles.
(a) Supplementary (b) Alternate (c) Complementary (d) Corresponding

(xxxvii) The sum of two supplementary angles is equal to _____degrees
(a) 90 (b) 180 (c) 360 (d) 100

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## SECTION B

**Marks 24**

**NOTE:** **Attempt any SIX from the following .Each question carries 4 marks.**

Q.2 If a,b represent elements of $Z^+$, find the domain and range of the relation $R=\{(a,b)\,|\,2a+b=10\}$.

Q.3 If $U=\{1,2,3,...,20\}$, $A=\{1,3,5,...,19\}$ *and* $B=\{2,4,6,...,20\}$ then prove any one of the De Morgan's Laws.

Q.4 If $x=\sqrt{5}+2$ then find the value of $x^4+\frac{1}{x^4}$.

Q.5 Find the value of $\frac{\sqrt{431.5}\times(1.2)^2}{\sqrt[3]{36.98}}$ using logarithms.

Q.6 Find the value of $8ab\left(a^2+b^2\right)$ when $a+b=5$ and $a-b=-5$.

Q.7 What should be subtracted from $2x^4+3x^3-x^2-1$ so that it becomes exactly divisible by $x-2$ ?



Q.8 Find the value of $27x^3-\frac{1}{x^3}$ *when* $3x-\frac{1}{x}=2$.

Q.9 Factorize any two : (i) $x^4+4$ (ii) $6x^2+11x-10$ (iii) $2x^3-250y^3$.

## SECTION C
## LONG QUESTIONS

**Marks 14**

**Note: Attempt any ONE (a & b) from the following.**

Q.10 (b) Define any two of the following with figures.

(i) Line segment (ii) Adjacent angles (iii) Ray

(b) Apply Cramer's Rule to solve the system of equations :

$$4x-3y=7$$
$$5x+2y=3$$

Q.13 (a) If two lines intersect , the vertical angles so formed are congruent. Prove it.

(b) If $A=\begin{bmatrix}3 & 2\\ 1 & 0\end{bmatrix}$ then find $A^{-1}$ and verify that $AA^{-1}=I$.