**Model Paper “Mathematics-II”**

<table>
<thead>
<tr>
<th>D</th>
<th>C</th>
<th>B</th>
<th>A</th>
<th>Questions / سوالات</th>
<th>عدد</th>
</tr>
</thead>
<tbody>
<tr>
<td>$a^2 + b^2$</td>
<td>$-4ab$</td>
<td>$4ab$</td>
<td>$2(a^2 + b^2)$</td>
<td>$(a+b)^2 - (a-b)^2 =$</td>
<td>1</td>
</tr>
<tr>
<td>$\frac{1}{2}$</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>$\sqrt{a} = a^{\frac{1}{2}}$ is a surd of order:</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>A cubic polynomial is degree:</td>
<td>3</td>
</tr>
<tr>
<td>$(x-2)(x+4)$</td>
<td>$(x-2)(x+2)$</td>
<td>$(x^2 + 4)$</td>
<td>$(x-2)(x+2)$</td>
<td>Factorization of $x^3 - y^3$ is:</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>The methods to determine HCF are:</td>
<td>5</td>
</tr>
<tr>
<td>${-8, 2}$</td>
<td>${8, 2}$</td>
<td>${-8, -2}$</td>
<td>${8, -2}$</td>
<td>Find the solution set of $</td>
<td>x</td>
</tr>
<tr>
<td>Constant</td>
<td>Solution</td>
<td>Inequation</td>
<td>Equation</td>
<td>The value of the variable which makes the equation a true statement is called the:</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>A quadratic equation has a degree:</td>
<td>8</td>
</tr>
<tr>
<td>${-1}$</td>
<td>${\pm 1}$</td>
<td>${\pm 1}$</td>
<td>${1}$</td>
<td>The solution set of $x^2 = 1$ is:</td>
<td>9</td>
</tr>
<tr>
<td>$A^1B^1$</td>
<td>$B^1A^1$</td>
<td>B</td>
<td>A</td>
<td>In matrices $(AB)^1 =$</td>
<td>10</td>
</tr>
<tr>
<td>$\begin{bmatrix} -1 &amp; 3 &amp; -3 \ 2 &amp; 4 &amp; 3 \end{bmatrix}$</td>
<td>$\begin{bmatrix} 1 &amp; 2 \ -3 &amp; 4 \end{bmatrix}$</td>
<td>$\begin{bmatrix} 1 &amp; 3 \ -1 &amp; 2 \end{bmatrix}$</td>
<td>$\begin{bmatrix} -1 &amp; 2 \ 3 &amp; 4 \end{bmatrix}$</td>
<td>The transpose of $B = \begin{bmatrix} -1 &amp; 2 \ 3 &amp; 4 \end{bmatrix}$ is:</td>
<td>11</td>
</tr>
<tr>
<td>$360^\circ$</td>
<td>$270^\circ$</td>
<td>$180^\circ$</td>
<td>$90^\circ$</td>
<td>The sum of the angles of triangles is:</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>The number of medians in a triangle is:</td>
<td>13</td>
</tr>
<tr>
<td>$r$</td>
<td>$\frac{1}{2}$</td>
<td>$\sqrt[3]{a}$</td>
<td>$\pi r^2$</td>
<td>Area of a circle formula is:</td>
<td>14</td>
</tr>
<tr>
<td>Equal points</td>
<td>Non-collinear points</td>
<td>Collinear points</td>
<td>Distance formula</td>
<td>$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ is called:</td>
<td>15</td>
</tr>
</tbody>
</table>
Model Paper “Mathematics-II”

Note: Write same question number and its part number in answer book, as given in the question-paper.

(PART – I)

2. Write short answers to any SIX (6) questions:

(i) Simplify: \( \sqrt{180} + \sqrt{24} \) (i)

(ii) If \( x = \sqrt{5} + 2 \) then find the value of \( x + \frac{1}{x} \) (ii)

(iii) Simplify: \( (7 + \sqrt{3}) (5 + \sqrt{2}) \) (iii)

(iv) Factorize: \( 9a^2 - (b + c)^2 \) (iv)

(v) Factorize: \( 27x^3 + 1 \) (v)

(vi) Evaluate the polynomial for the value indicated:

\[ P(x) = 2x^3 - 5x^2 + 7x - 7; P(2) \] (vi)

(vii) Define Highest Common Factor (H.C.F.). (vii)

(viii) Find H.C.F of 6pq and 15qrs (viii)

(ix) Find L.C.M. of: 2ab, 3ab, 4ca (ix)

3. Write short answers to any SIX (6) questions:

(i) Define inequation. (i)

(ii) Solve: \( x - 7 \leq 5 - 2x \) (ii)

(iii) Solve: \( |x - 3| = 5 \) (iii)

(iv) Write the names of two methods to solve the quadratic equation. (iv)

(v) Solve by factorization: \( x^2 - 4x + 12 = 0 \) (v)

(vi) Solve by quadratic formula if: \( a = 1, b = -5, c = 6 \) (vi)

(vii) Define symmetric matrix. (vii)

(viii) Find transpose of: \( B = \begin{bmatrix} -3 & -2 \\ -1 & 4 \end{bmatrix} \) (viii)

(ix) If \( A = \begin{bmatrix} 1 \\ 4 \\ 5 \end{bmatrix}, B = \begin{bmatrix} 4 \\ 7 \\ 6 \end{bmatrix} \) then find \( A + B \) (ix)

4. Write short answers to any SIX (6) questions:

(i) Define diameter of circle. (i)

(ii) Define concyclic point. (ii)

(iii) Define concentric circle. (iii)

(iv) Define the medians of a triangle. (iv)
4. (v) Define centroid of triangle.
(vi) Define Pythagoras Theorem.
(vii) Write a formula for the volume of a right circular cylinder.
(viii) Write a distance formula.
(ix) Differentiate between collinear and non-collinear points.

(PART-II)

Note: Attempt any THREE questions.

5. (a) If \( x = \sqrt{3} - \sqrt{2} \) then find the value of \( x^2 + \frac{1}{x^2} \)

5 (b) Factorize: \( a - b - a^3 + b^3 \)

6. (a) Find the square root: \( \left( \frac{x^2 + \frac{1}{x^2}}{2} \right) - 10 \left( \frac{x + \frac{1}{x}}{2} \right) + 27 \)

6 (b) Solve: \( \frac{4x}{5} - \frac{3x}{4} = 4 \)

7. (a) If \( A = \begin{bmatrix} 2 & 4 \\ 1 & 5 \end{bmatrix} \) and \( B = \begin{bmatrix} 3 & -2 \\ 4 & 6 \end{bmatrix} \) then find \( A^t + B^t \)

7 (b) If \( A = \begin{bmatrix} 4 & 2 \\ 5 & 4 \end{bmatrix} \) then find \( A^{-1} \)

8. (a) Find two consecutive positive numbers such that the sum of their squares is 113.

8 (b) Draw an equilateral \( \triangle ABC \) in which \( m\angle A = m\angle B = m\angle C = 60^\circ \). Draw its altitudes.

9. (a) Find the volume of a right circular cylinder, with circumferences of base 4 cm and altitude 1 m.

9 (b) Show that the points \( A (-1, 1) \), \( B (3, 2) \) and \( C (7, 3) \) are collinear.

270-014-II-(Essay Type)-68000
(New Scheme)