

MATHEMATICS Part-I HSSC-11th-Swat-2026 Time: 20 Minutes Marks: 20 Multiple Choice Questions 01 Mark for each	Paper Code ① ● ②	P-403 Roll No. of the Student <table border="1" style="display: inline-table; width: 100px; height: 20px; vertical-align: middle;"></table> Serial No. Of the Answer Book _____
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SECTION-A

Note:

- 1) Attempting all MCQs is compulsory. This paper along with the OMR sheet must be returned to the superintendent after due time.
- 2) Fill the circle (A) (B) (C) (D), which one is correct with blue or black ball point in separate OMR Sheet like ●
- 3) If more than one circle in the OMR sheet is filled then no credit will be given to such answer.

- I. i. The sum of the series $(5 + 6 + 7 + 8 + \dots + 55)$ is:
 (A) 1425 ● 1530 (C) 1475 (D) 1495
- ii. The fifth coefficient in the row of Pascal's Triangle for $(x + y)^8$ is:
 (A) 8 (B) 29 ● 56 (D) 70
- iii. The Domain of the function $f(x) = \sqrt{4 - x^2}$ is:
 ● $-2 \leq x \leq 2$ (B) $x \leq 2$ (C) $x \geq -2$ (D) All real numbers
- iv. The graph of the function $f(x) = \frac{3}{x^6} + 7$ is symmetric about:
 (A) X-axis ● Y-axis (C) Z-axis (D) Origin
- v. The corner points for the region bounded by $y \geq 0, x + y \leq 6$ & $x \geq 0$ are:
 (A) (0,5), (3,5), (0,8) (B) (0,4), (13,5), (0,-8) (C) (4,5), (0,5), (0,4) ● (0,0), (0,6), (6,0)
- vi. The Value of $\cos(\pi + \beta)$ is equal to:
 (A) $\cos \beta$ (B) $\sin \beta$ (C) $\cos(-\beta)$ ● $-\cos \beta$
- vii. When θ lies in the first quadrant then $\sin \theta/2$ equal to:
 (A) $-\sqrt{\frac{1 - \cos \theta}{2}}$ ● $\sqrt{\frac{1 - \cos \theta}{2}}$ (C) $\sqrt{\frac{1 + \cos \theta}{2}}$ (D) $-\sqrt{\frac{1 + \cos \theta}{2}}$
- viii. In any oblique triangle, the relation $a^2 = b^2 + c^2 - 2bc \cos A$ is known as:
 (A) Law of Sines ● Law of Cosines (C) Law of Tangent (D) Law of Cotangent
- ix. The minimum value of the function $y = 3 + 3\cos(4\theta + 2)$ is:
 (A) -1 (B) 1 ● 0 (D) 2
- x. Unlike the tangent function, the functions $y = \sin x$ and $y = \cos x$ are:
 (A) Discontinuous at x ● Continuous for all real numbers (C) Periodic but discontinuous (D) Undefined at the origin
- xi. The modulus of the complex number $-4 + 3i$ is:
 (A) $\sqrt{7}$ (B) $\sqrt{12}$ (C) 25 ● 5
- xii. A square matrix $A = [a_{ij}]$ is called a diagonal matrix if $a_{ij} = 0$ for all:
 (A) $i = j$ ● $i \neq j$ (C) $i < j$ (D) $i > j$
- xiii. The Cofactor of the element a_{21} of the matrix $A = \begin{bmatrix} 1 & 6 & 7 \\ 2 & 5 & 8 \\ 3 & 4 & 9 \end{bmatrix}$ is:
 (A) -4 (B) 4 (C) -35 ● -26
- xiv. The determinant of the matrix $\begin{bmatrix} 1 & 6 & 1 \\ 5 & 5 & 6 \\ 1 & 6 & 1 \end{bmatrix}$ is:
 (A) -5 ● 0 (C) 5 (D) 10
- xv. The unit vector in the direction of the vector $4i + 3j$ is:
 (A) $\frac{4}{5}i - \frac{3}{5}j$ (B) $\frac{3}{5}i + \frac{4}{5}j$ ● $\frac{4}{5}i + \frac{3}{5}j$ (D) $\frac{3}{5}i - \frac{4}{5}j$
- xvi. The magnitude of the vectors $a = 4i + 3j + 12k$ is:
 (A) $5\sqrt{2}$ (B) $12\sqrt{5}$ (C) 25 ● 13
- xvii. The Arithmetic Mean of 11 & 17 is:
 (A) 12 (B) 13 ● 14 (D) 15
- xviii. The Sum of the cubes of the first 10 natural number is:
 (A) 1025 (B) 2025 ● 3025 (D) 3050
- xix. The number of different arrangements of the letters of the word "Statistics" is:
 (A) 44000 (B) 44040 ● 50400 (D) 50800
- xx. The number of ways a committee of 5 members can be formed from a group of 10 people are:
 (A) 110 (B) 125 (C) 210 ● 252

MATHEMATICS Part-I

HSSC-11th-Swat-2026

Note: Time allowed for section B and C is 2 hours and 40 minutes.

SECTION "B"

Marks: 50

II. Attempt any Ten Parts out of the following. Each Part carries equal marks.

- i. Find the additive and multiplicative inverse of complex number, $5 - 3i$.
- ii. Using cofactors find determinant of the Matrix: $A = \begin{bmatrix} 4 & 2 & 1 \\ 7 & 5 & 3 \\ 3 & 4 & 6 \end{bmatrix}$
- iii. Reduce the given matrix to its Row Echelon form $\begin{bmatrix} 7 & -4 & 1 \\ 5 & 5 & 2 \\ 3 & -3 & 5 \end{bmatrix}$
- iv. Find the direction cosines of the vector from point A (4,3,-3) to B(6,5,1).
- v. Find the angle between two vectors $\vec{OA}$ & $\vec{OB}$ where $\vec{OA} = 6i - 3j$ $\vec{OB} = 5i + 4j$.
- vi. Find the sum of the infinite series: $\frac{2}{9}, -\frac{2}{27}, +\frac{2}{81}, -\frac{2}{243}, +\dots$
- vii. Find the sum of the series $2 \cdot 1 + 5 \cdot \frac{1}{2} + 8 \cdot \frac{1}{4} + 11 \cdot \frac{1}{8} + \dots$ to n term.
- viii. If a pair of dice is rolled, find the probability that the sum of the digits is either 10 or 12.
- ix. Using binomial expansion, find $\sqrt[3]{26}$ correct up to four decimal places
- x. Without graphing, Determine the vertex, axis, and opening direction for $f(x) = x^2 - 4x + 7$.
- xi. Express $\sin 5\theta - \sin 7\theta + \sin 9\theta - \sin 11\theta$ as a product.
- xii. Find measure of the angles of a triangle whose sides are 8, 12 & 13.
- xiii. Find Domain and Range of $y = 5\cos 2x + 3$

SECTION "C"

Marks: 30

Note: Attempt any Three questions of the following. Each question carries equal Marks.

- III. a. Factorize the polynomial $P(z) = z^3 + 3z^2 - 4z - 12$ into linear factors.
- b. Using elementary row operations find inverse of the Matrix: $A = \begin{bmatrix} 2 & 5 & 1 \\ 6 & 2 & -3 \\ 3 & 1 & 2 \end{bmatrix}$
- IV. a. For what value of m the following vectors are coplanar?
 $\vec{a} = 3i - 2j + 4k$, $\vec{b} = i + j + k$, $\vec{c} = 2i - 3j + mk$
- b. Find the 15th term of the harmonic sequence: $2, \frac{2}{3}, \frac{2}{5}, \dots$
- V. a. A curator has 11 paintings and space to hang 7. How many arrangements of paintings can be selected if:
 - (a) Three specific "Masterpiece" paintings must always be displayed.
 - (b) Three specific paintings are under restoration and must be excluded.
- b. A tailor has 100 square meters of fabric to make Shirts and Trousers. A shirt requires 1.5 meters, and a pair of trousers requires 2.5 meters. He has a total 60 man-hours available. Making a shirt takes 1 hour, while trousers take 2 hours. If the profit on a shirt is Rs. 300 and on trousers is Rs. 500, how many of each should be produced?
- VI. a. Find the circumscribing radius for a triangle whose sides are 5, 7 & 10.
- b. Describe the Amplitude, Period & Frequency without drawing the graph of the function:
 $y = 4\cos \frac{2x}{3}$