

SECTION 1

MAX. MARKS: 1X 25 =25

Note: Each part of Section 1 has four possible answers (a), (b), (c), & (d). Encircle the correct answer.

- i. $\sqrt{25}$ is a
(a) an irrational number (b) a rational number
(c) an even integer (d) none of these
- ii. The set of students of your class is
(a) infinite set (b) finite set (c) null set (d) solution set
- iii. The order of the matrix $\begin{bmatrix} 7 & 2 & 3 \\ 0 & 1 & 2 \end{bmatrix}$ is:
(a) 3×2 (b) 2×2 (c) 3×1 (d) 2×3
- iv. $3x^2 + 6x + 1 = 0$ is a
(a) polynomial of degree 3 (b) polynomial of degree 1
(c) polynomial of degree 2 (d) polynomial of degree 4
- v. To resolve a combined fraction into its parts is called :
(a) rational fraction (b) partial fraction
(c) combined fraction (d) none of these
- vi. The geometric mean between a and b is
(a) $\frac{a-b}{2}$ (b) $\frac{b-a}{2}$
(c) $\frac{a+b}{2}$ (d) $\pm\sqrt{ab}$
- vii. A die is rolled once, the probability that the dots on the top are greater than 3 is
(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) none of these

- viii. Number of terms in the expansion of $(a + b)^n$ is
 (a) $n + 1$ (b) $n - 1$ (c) n (d) $n^2 + 1$
- ix. θ° is measured in
 (a) Circular System (b) Sexagesimal System
 (c) MKS System (d) CGS System
- x. $\sin(\alpha + \beta) =$
 (a) $\cos \alpha \cos \beta - \sin \alpha \sin \beta$ (b) $\cos \alpha \cos \beta + \sin \alpha \sin \beta$
 (c) $\sin \alpha \cos \beta - \cos \alpha \sin \beta$ (d) $\sin \alpha \cos \beta + \cos \alpha \sin \beta$
- xi. The period of $\sin x$ is
 (a) $\frac{\pi}{3}$ (b) $\frac{\pi}{2}$ (c) $\frac{2\pi}{3}$ (d) 2π
- xii. The number of bacteria in a jar doubles every minute. After 40 minutes the jar is full. The jar would be half full after :
 (a) 20 minutes (b) 25 minutes (c) 32 minutes (d) 39 minutes
- xiii. The area of a square of side length 6 =
 (a) 18 square units (b) 36 square units
 (c) 24 square units (d) 48 square units
- xiv. $\frac{d}{dx}(x^2 - 3)^5 =$
 (a) $10x(x^2 - 3)^4$ (b) $2x(x^2 - 3)^4$
 (c) $5x(x^2 - 3)^4$ (d) $5(x^2 - 3)^4$
- xv. $\int \frac{d}{dx} x^n dx =$
 (a) $\frac{x^{n+1}}{n} + c$ (b) $\frac{x^{n-1}}{n-1} + c$ (c) $\frac{x^{n+1}}{n+1} + c$ (d) $x^n + c$
- xvi. The value of $x + x(x^x)$ when $x = 3$ is::
 (a) 18 (b) 21 (c) 84 (d) 81

- xvii. A pentagon has
(a) 3 sides (b) 4 sides (c) 5 sides (d) 6 sides
- xviii. Equation of circle with center at origin and radius r is:
(a) $x^2 - y^2 = r^2$ (b) $x^2 + y^2 = r^2$ (c) $x + y = r$ (d) $x - y = r$
- xix. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ is :
(a) scalar matrix (b) diagonal matrix
(c) identity matrix (d) zero matrix
- xx. $4 \times 10 \div 5 - 3 = ?$
(a) 5 (b) 10 (c) 20 (d) 8
- xxi. Evaluation of $8^4 \times 8^3 \times 8^{-7}$ is
(a) 1 (b) 0 (c) 8 (d) none of these
- xxii. The distance light travels in one year is approximately 5,870,000,000,000 miles. The distance light travels in 10 years is
(a) 587×10^{10} miles (b) 587×10^{11} miles
(c) 587×10^{-11} miles (d) 587×10^{-10} miles
- xxiii. The simplest form of $2.5 : 3.5$ is?
(a) $10 : 15$ (b) $15 : 25$ (c) $0.75 : 1.25$ (d) $5 : 7$
- xxiv. The average of first 12 natural numbers is:
(a) 6.1 (b) 6 (c) 6.5 (d) 2
- xxv. A clock strikes once at 1 o'clock, twice at 2 o'clock, thrice at 3 o'clock and so on. How many times will it strike in 24 hours?
(a) 78 (b) 136 (c) 156 (d) 196

SECTION 2

MAX. MARKS: 3 X 5 =15

Note: Solve the following QUESTIONS in the given space, each question has three marks.

Q No.1	Convert the equation $\frac{y}{y+1} + \frac{y+1}{y} = \frac{5}{2}$ to a quadratic equation.
Sol:	
Q No.2	The sum of two consecutive numbers is 41. Find the numbers.
Sol:	

Q No.3	Pakistan and India play a cricket match. Find the probability that the match ties.
Sol:	
Q No.4	Find the number A.M. between $3\sqrt{5}$ and $5\sqrt{5}$.
Sol:	

Q No.5	If ${}^nC_{12} = {}^nC_6$, find n
Sol.	${}^nC_{12} = {}^nC_6$ $\Rightarrow n - 12 = 6$ $\Rightarrow n = 18$

SECTION 3

MAX. MARKS: 5 X 2 =10

Note: Solve the following QUESTIONS in the given space, each question has five marks.

Q No.1	If $y = x^4 - 2x^2 + 4$, prove that $\frac{dy}{dx} = 4x\sqrt{y-3}$
Sol:	

Q No.2	Find the value of r if $a_4 = \frac{8}{27}$ and $a_7 = -\frac{64}{729}$ of a G.P.
Sol:	<p>NATIONAL COLLEGE OF ARTS (LAHORE & RAWALPINDI CAMPUS) ADMISSION ACADEMIC SESSION 2022 (SINDH & KHYBERPAKHTUNKHWA)</p> <p>Time: 1 Hour Total Time: 1 Hour</p> <p>Name: _____</p> <p>Roll No: _____</p> <p>Please read the instructions carefully.</p> <p>The paper is divided into two parts.</p> <p>Calculator is not allowed.</p> <p>There will be no extra marks for writing answers or doing rough work.</p> <p>Each question carries 10 marks.</p> <p>Total marks are 100.</p>