

SECTION 1

Max. Marks: $1 \times 25 = 25$

- (1) $\frac{2\pi}{3}$ radians =
(a) 160° (b) 120° (c) 0° (d) 180°
- (2) The multiplicative inverse of $-i$
(a) i (b) $-i$ (c) 1 (d) -1
- (3) $\sqrt{\frac{5}{16}}$ is:
(a) Rational number (b) Irrational number
(c) Prime number (d) Whole number
- (4) If A is a square matrix of order 3×3 then $|KA|$ equal.
(a) $K|A|$ (b) $K^2|A|$ (c) $K^3|A|$ (d) $K^4|A|$
- (5) A die is rolled once. The probability that the dots on the top are greater than four is:
(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{6}$
- (6) The number of terms in the expansion of $(2a + b)^{13}$ are
(a) 12 (b) 13 (c) 14 (d) 15
- (7) If ω is the imaginary cube root of unit then $\omega^2 =$
(a) 1 (b) -1 (c) ω^{-1} (d) ω^{-2}
- (8) Set of the first elements of the ordered pairs forming a relation is called
(a) Domain (b) Range (c) Binary (d) Set
- (9) Solution set of equation $6x^2 + x - 15 = 0$ is
(a) $\left\{\frac{2}{3}, \frac{-5}{3}\right\}$ (b) $\left\{\frac{3}{2}, \frac{-5}{3}\right\}$ (c) $\left\{\frac{-3}{2}, \frac{-5}{3}\right\}$ (d) $\left\{\frac{2}{3}, \frac{3}{5}\right\}$
- (10) An equation, which remain unchanged when x is replaced by $\frac{1}{x}$ is called
(a) Exponential equation (b) Radical Equation
(c) Reciprocal equation (d) Quadratic Equation

(3) Product of all fourth roots of unity is

- (a) 1 (b) i (c) $-i$ (d) -1

(12) A.M between $x - 3$ and $x + 5$ is

- (a) $4\sqrt{x}$ (b) $x + 1$ (c) $1 + x^2$ (d) $x^2 - 5$

(13) Factorial form of $20.19.18.17 \cdot$

- (a) $\frac{20!}{16!}$ (b) $\frac{10!}{16!}$ (c) $\frac{52!}{4!}$ (d) $\frac{16!}{20!}$

(14) $\cos P - \cos Q =$

- (a) $2\cos \frac{P+Q}{2} \cos \frac{P-Q}{2}$ (b) $2\sin P \cos Q$
(c) $2\sin \frac{P+Q}{2} \sin \frac{P-Q}{2}$ (d) $2\cos \frac{P+Q}{2} \sin \frac{P-Q}{2}$

(15) Evaluate of ${}^{10}P_7 =$

- (a) 480600 (b) 6048000 (c) 60480 (d) 604800

(16) Simplest form of $6\frac{2}{5}:9.6:16$ is

- (a) 2:5:3 (b) 5:2:3 (c) 2:3:5 (d) 1:5:0

(17) Complete the sequence 2, 5, 10, 13, 26

- (a) 29, 58, 61 (b) 27, 57, 61 (c) 29, 78, 42 (d) 61, 74, 42

(18) If $8(x - 5) = 4(3x - 3)$ value of $x =$

- (a) 7 (b) -7 (c) 8 (d) -8

(19) Distance between $A(3, -11)$, $B(3, 4)$ is

- (a) 14 (b) 7 (c) 5 (d) 28

(20) Lowest form of $\frac{120x^2y^3z^5}{30x^3yz}$ is

- (a) $4x^2y^3z^5$ (b) $\frac{4y^2z^4}{x}$ (c) $\frac{4x^2y^3z^5}{z}$ (d) $\frac{4xyz}{x}$

(21) Which of the following is a solution to: $x + x^2 = 1$

- (a) -1 (b) 0 (c) $\frac{1}{2}$ (d) 1 (e) one

(22) $\sin^2 x + \cos^2 x =$

- (a) -1 (b) 1 (c) 0 (d) 2

(23) The greatest angle is opposite to:

- (a) Smallest side (b) Greatest side
(c) right side (d) none of these

(24) If integer x was divided by 7, the quotient would be 12 with a remainder of 1. Therefore x equals.

- (a) 91 (b) 90 (c) 85 (d) 83

25 What is 10% of 20% of 30%?

- (a) 0.006% (b) 0.6% (c) 6% (d) 60%

SECTION 2

Max. Marks: $5 \times 5 = 25$

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

Q No.2	An open water tank with length 20 cm width 15 cm holds 4 litres of water. Calculate the height of water level in the tank and total surface of cuboid in contact with water.
Sol.	

Q No.3	Prove $\cos^2\theta - \sin^2\theta = \frac{1-\tan^2\theta}{1+\tan^2\theta}$
Sol.	

Q No.4	Simplify $\frac{x^2+x-6}{x^2-x-6} \times \frac{x^2-4}{x^2-9}$
Sol.	

Q No.5	Write solution set of $2\frac{2}{3}x + \frac{2}{3}(5x - 4)7 - \frac{1}{3}(8x + 7)$
Sol.	

	MATHS
Q No.6	If $A = \begin{bmatrix} 1 & 2 & 0 \\ 3 & 2 & -1 \\ -1 & 3 & 2 \end{bmatrix}$, show that (i) $A + A'$ is symmetric.
Sol.	NATIONAL COLLEGE OF ARTS LAUREL CAMPUS ADMISSION ACADEMIC SESSION (SELF FINANCE SCHEME) MATHEMATICS TEST Total Marks: 50 Total Time: 45 minutes Name of candidate _____ Roll No. _____ Note: Please read the instructions carefully. Write your name and roll no. in the given space. Use this paper to write the answer of the questions. Use of calculator is not allowed. No mark will be awarded for writing overwriting or using extra paper. Section A & B is of 1 part. Each question of Section C is of five marks. No. Extra sheet will be provided for doing rough work.