Mathematics

Paper : I

SWL-21

Roll No. | | | | | | |

(To be filled in by the candidate

Inter (Part-I)-A-2021

Objective – (III)

Paper Code | 6 | 1 | 9 | 5 |

Time : 30 Minutes

Marks : 20

Note: -You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of the question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

Q.1	Questions	A	B	C	D
1.	$\sin\left(\frac{3\pi}{2}-\theta\right)=$	$\sin\theta$	$\cos\theta$	$-\sin\theta$	$-\cos\theta$
2.	$Tan^{-1}\left(-\sqrt{3}\right)=$	$\frac{2\pi}{3}$	$\frac{-2\pi}{3}$	$\frac{-\pi}{6}$	$\frac{-\pi}{3}$
3.	Radius of the inscribed circle is:	$r=\frac{\Delta}{S}$	$r=\frac{abc}{4\Delta}$	$r=\frac{S}{\Delta}$	$r=\frac{S-a}{\Delta}$
4.	If n is any positive integer, then $2^n>2(n+1)$ is true for all.	$n\leq 3$	$n<3$	$n\geq 3$	$n>3$
5.	The period of $3\sin 3x$ is:	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	π
6.	If $\sin x=\frac{-\sqrt{3}}{2}$, then solution is:	$\frac{4\pi}{6},\frac{5\pi}{6}$	$\frac{4\pi}{3},\frac{5\pi}{3}$	$\frac{5\pi}{6},\frac{7\pi}{6}$	$\frac{\pi}{3},\frac{7\pi}{3}$
7.	Any real number "a" is equal to:	ia	(a,b)	a	(b,a)
8.	What angle is quadrantal angle?	120°	270°	60°	45°
9.	If a,b,c have their usual meanings then $\frac{c^2+a^2-b^2}{2ac}=$	$\cos\alpha$	$\cos\beta$	$\cos\gamma$	$\sin\beta$
10.	$\frac{{}^nP_r}{r!}$ is equal to:	${}^nC_r$	${}^nC_{r-1}$	${}^{n+1}C_r$	${}^{n-1}C_r$
11.	Rank of matrix $\begin{bmatrix}1&0&0\\0&1&0\\0&0&0\end{bmatrix}$ is:	1	2	3	4
12.	If a,A,b are in A.P, then 2A is:	$a-b$	$\frac{a+b}{2}$	$a+b$	$b-a$
13.	If $a_{n-3}=2n-5$, its nth term is:	$2n+1$	$2n+3$	$2n-2$	$2n-8$
14.	$\frac{x^3+1}{(x-1)(x+2)}$ is:	proper fraction	improper fraction	identity	both B & C
15.	If one root of the equation $x^2-3x+a=0$ is 2, then a is:	2	-2	3	-3
16.	An equation of the form $ax^2+bx+c=0$ is called quadratic if:	$a=0$	$b=0$	$a\neq 0$	$b\neq 0$
17.	Let A,G,H be the A.M, G.M and H.M between a and b respectively, then $G^2=$	$A+H$	$\sqrt{ab}$	$\frac{A}{H}$	AH
18.	If A is a matrix of order 3×4, then the order of AA' is:	4×3	3×3	3×4	4×4
19.	$\{x\mid x\in E\wedge 4<x<6\}$ equals:	$\{4\}$	$\{5\}$	$\{6\}$	ϕ
20.	If $\cos\theta=\frac{1}{\sqrt{2}}$, then θ is equal to:	30°	45°	60°	90°

Roll No. | | | | | | | (To be filled in by the candidate)

Mathematics — Inter (Part-I)-A-2021 — Time : 2:30 Hours

Paper : I SWL - 21 — Subjective — Marks : 80

Note: - Section I is compulsory. Attempt any three questions from section II.

Section – I

2. Write short answers to any Eight parts. **(8 x 2 = 16)**

i. Find the multiplicative inverse of $(\sqrt{2}, -\sqrt{5})$

ii. Prove that $-\frac{7}{12} - \frac{5}{18} = \frac{-21-10}{36}$

iii. If $z_1 = 2+i$, $z_2 = 3-2i$, $z_3 = 1+3i$ then express $\frac{\overline{z_1}\,\overline{z_3}}{z_2}$ in the form $a+ib$

iv. Write the inverse and contrapositive of conditional $\sim p \rightarrow \sim q$

v. Show $A-B$ and $B-A$ by Venn diagram when A and B are overlapping sets.

vi. If a and b are elements of a group G, then solve the equation $xa = b$

vii. Find the matrix X if $X\begin{bmatrix} 5 & 2 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 12 & 3 \end{bmatrix}$

viii. Show that $\begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ yz & zx & xy \end{vmatrix} = \begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ x^2 & y^2 & z^2 \end{vmatrix}$

ix. If $A = \begin{bmatrix} -1 & 2 \\ 1 & 4 \\ 2 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \\ -2 & 1 \end{bmatrix}$ show that $(AB)' = B'\,A'$

x. Find two consecutive numbers, whose product is 132.

xi. Evaluate $\left(-1+\sqrt{-3}\right)^5 + \left(-1-\sqrt{-3}\right)^5$

xii. Find numerical value of K, if the polynomial $x^3 + kx^2 - 7x + 6$ has a remainder of -4, when divided by $x+1$

3. Write short answers to any Eight parts. **(8 x 2 = 16)**

i. Write into partial fraction form of $\frac{4x^2}{(x^2+1)^2(x-1)}$ without finding constants.

ii. Write into partial fraction form of $\frac{1}{(x-1)^2(x^2+2)}$ without finding constants.

iii. If $a_{n-3} = 3n-11$, find nth term of the sequence.

iv. Find the Geometric Mean between $-2i$ and $8i$.

v. If $y = 1+2x+4x^2+8x^3+\ldots$ show that $x = \frac{y-1}{2y}$

vi. Find 8^{th} term of H.P; $\frac{1}{2}, \frac{1}{5}, \frac{1}{8}, \ldots$

vii. Write $\frac{52.51.50.49}{4.3.2.1}$ in the factorial form.

viii. Find the value of n when ${}^{11}P_n = 11.10.9$

ix. Find the value of n, when ${}^{n}C_5 = {}^{n}C_4$

x. Show that the inequality $4^n > 3^n + 4$ is true, for integral values of $n \geq 2$.

xi. Calculate $(9.98)^4$ by means of binomial theorem.

xii. Expand $(1+x)^{\frac{-1}{3}}$ upto 4 terms.

(Turn Over)