Roll No _____ (To be filled in by the candidate)

(Academic Sessions 2020 – 2022 to 2022 – 2024)

MATHEMATICS 224-1st Annual-(INTER PART – II) Time Allowed : 30 Minutes

Q.PAPER – II (Objective Type) GROUP – I Maximum Marks : 20

PAPER CODE = 8195

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	If $f(x)=3-\sqrt{x}$ then $f'(1)$ is equal to : (A) $-\frac{1}{2}$ (B) 0 (C) $\frac{1}{2}$ (D) 1
2	$4\int_0^{\pi/4} \sin 2x\,dx =$: (A) $4-2\sqrt{2}$ (B) $\frac{\sqrt{3}}{2}$ (C) $\frac{1}{2}$ (D) $\sqrt{3}$
3	$\lim_{x\to 0} \frac{\sin ax}{\sin bx} =$: (A) $-\frac{a}{b}$ (B) $-\frac{b}{a}$ (C) $\frac{a}{b}$ (D) $\frac{b}{a}$
4	$\int \ell nx\,dx =$: (A) $\frac{1}{x}+c$ (B) $x\,\ell nx+c$ (C) $\frac{(\ell nx)^2}{2}+c$ (D) $x(\ell nx-1)+c$
5	Let $f(x)=\sqrt{1-x^2}$ in R then domain of f is : (A) Real numbers (B) $\lvert x\rvert \le 1$ (C) Negative real numbers (D) Integers
6	If $\int x\ e^{x^2}\,dx = k\ e^{x^2}$ then k = : (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{x}{3}$ (D) $\frac{x}{2}$
7	If $f(x)$ has second derivative at c such that $f'(c)=0$ and $f''(c)<0$ then c is point of : (A) Maxima (B) Minima (C) Point of inflection (D) Origin
8	If $y=\cot x$, then $\frac{dy}{dx}$ is given by : (A) $\text{cosec}^2 x$ (B) $-\text{cosec}^2 x$ (C) $\tan x$ (D) $-\text{cosec}\,x\cot x$
9	$\int \frac{1}{x^2+a^2}dx =$: (A) $\tan^{-1}\frac{x}{a}+c$ (B) $\frac{1}{a}\tan^{-1}\frac{x}{a}+c$ (C) $\frac{a}{x}\tan^{-1}\frac{x}{a}+c$ (D) $\frac{1}{a}\tan^{-1}\frac{a}{x}+c$

(Turn Over)

1-10	For $y = \log_e 5x$, $\frac{dy}{dx} =$: (A) $\frac{1}{x}$ (B) 5 (C) $\frac{1}{5x}$ (D) 1
11	The straight line $y = mx + c$ is tangent to the parabola $y^2 = 4ax$ if : (A) $c = \frac{a}{m}$ (B) $c = \frac{m}{a}$ (C) $c = \frac{a^2}{m^2}$ (D) $c = am$
12	y-coordinate of any point on x-axis is : (A) 0 (B) x (C) 1 (D) y
13	The volume of parallelepiped determined by $\underline{u} = \underline{i} + 2\underline{j} - \underline{k}$, $\underline{v} = \underline{i} - 2\underline{j} + 3\underline{k}$, $\underline{w} = \underline{i} - 7\underline{j} - 4\underline{k}$ is : (A) 48 (B) 50 (C) 52 (D) 55
14	The distance between the centres of the circles $x^2 + y^2 + 2x + 2y + 1 = 0$ and $x^2 + y^2 - 4x - 6y - 3 = 0$ is : (A) 1 (B) 4 (C) 5 (D) 15
15	If $\underline{a} + \underline{b} + \underline{c} = 0$ then which one is correct : (A) $\underline{a} \times \underline{b} \times \underline{c} = 0$ (B) $\underline{a} \times \underline{b} = \underline{b} \times \underline{c} = \underline{c} \times \underline{a}$ (C) $\underline{a} \cdot \underline{b} = \underline{b} \cdot \underline{c} = \underline{c} \cdot \underline{a}$ (D) $\underline{a} = \underline{b} = \underline{c}$
16	The x-intercept of the line $2x + 3y - 1 = 0$ is : (A) 2 (B) 3 (C) $\frac{1}{3}$ (D) $\frac{1}{2}$
17	The graph of $2x - 3y \leq 6$ is : (A) On the origin side (B) Not on the origin side (C) Not decided (D) Through the origin
18	The area of the triangle having $\underline{a}$ and $\underline{b}$ as its two sides is given by : (A) $\lvert \underline{a} \cdot \underline{b} \rvert$ (B) $\frac{1}{2} \lvert \underline{a} \cdot \underline{b} \rvert$ (C) $\lvert \underline{a} \times \underline{b} \rvert$ (D) $\frac{1}{2} \lvert \underline{a} \times \underline{b} \rvert$
19	Homogeneous equation of second degree $ax^2 + 2hxy + by^2 = 0$ where a, b, h are not all zero, represents two imaginary lines if : (A) $h^2 = ab$ (B) $h^2 > ab$ (C) $h^2 < ab$ (D) $h = ab$
20	The eccentricity of the ellipse $\frac{x^2}{64} + \frac{y^2}{28} = 1$ is : (A) $\frac{3}{4}$ (B) $\frac{4}{3}$ (C) $\sqrt{\frac{3}{4}}$ (D) $\sqrt{\frac{4}{3}}$