

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	The mid point of the line segment joining the foci of an ellipse is called : (A) Vertex (B) Directrix (C) Centre (D) Minor axis
2	If (3 , 5) is mid point of (5 , a) and (b , 7) then : (A) $a = 4, b = 2$ (B) $a = 3, b = 3$ (C) $a = 7, b = -2$ (D) $a = 3, b = 1$
3	If 2 and 2 are x and y components of a vector, then its angle with x-axis is : (A) 30° (B) 60° (C) 45° (D) 90°
4	(3 , 2) is not a solution of the inequality : (A) $x - y > 1$ (B) $x + y > 2$ (C) $3x + 5y > 8$ (D) $3x - 7y < 3$
5	$\underline{i} \times \underline{j} = :$ (A) $\underline{k}$ (B) $\underline{i}$ (C) $-\underline{k}$ (D) $\underline{j}$
6	Slope of line $3x - 2y + 5 = 0$ is : (A) $-\frac{2}{3}$ (B) $\frac{2}{3}$ (C) $\frac{3}{2}$ (D) $-\frac{3}{2}$
7	Length of the diameter of the circle $(x+5)^2 + (y-8)^2 = 12$: (A) $2\sqrt{3}$ (B) 12 (C) 24 (D) $4\sqrt{3}$
8	Transverse axis of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is : (A) $x = \frac{a}{e}$ (B) $y = 0$ (C) $x = 0$ (D) $y = \frac{a}{e}$
9	Equation of line in slope intercept form is : (A) $y = mx + c$ (B) $\frac{x}{a} + \frac{y}{b} = 1$ (C) $y - y_1 = m(x - x_1)$ (D) $x \cos \alpha + y \sin \alpha = p$
10	The condition for a line $y = mx + c$ to be tangent to the circle $x^2 + y^2 = a^2$ is that : (A) $c = \pm m\sqrt{1+a^2}$ (B) $c = \pm a\sqrt{1+m^2}$ (C) $c = \pm a\sqrt{1-m^2}$ (D) $c = \pm \sqrt{1-m^2}$

11	$f(x) = f(o) + xf'(o) + \frac{x^2}{2!} f''(o) + \frac{x^3}{3!} f'''(o) + \dots$ is called : (A) Taylor's series (B) Binomial series (C) Maclaurin's series (D) Laurent series
12	$\lim_{x \rightarrow 0} \frac{\sin 7x}{x} = :$ (A) 7 (B) -7 (C) $-\frac{1}{7}$ (D) $\frac{1}{7}$
13	$\int \frac{e^x}{e^x + 1} dx = :$ (A) $\ln(e^x + 1) + c$ (B) $\ln e^x + c$ (C) $e^{-x} + c$ (D) $e^x + c$
14	$\frac{d}{dx}(x^2 + 1)^2 = :$ (A) $2x(x^2 + 1)$ (B) $\frac{(x^2 + 1)^3}{3}$ (C) $2(x^2 + 1)$ (D) $4x(x^2 + 1)$
15	$\int \sin^2 x dx = :$ (A) $\frac{x}{2} - \frac{\sin 2x}{4} + c$ (B) $\frac{x}{2} + \frac{\sin 2x}{4} + c$ (C) $\frac{x}{2} - \frac{\sin 2x}{2} + c$ (D) $\frac{x}{2} + \frac{\sin 2x}{2} + c$
16	$\frac{d}{dx}(\tan x^2) = :$ (A) $\sec^2 x^2$ (B) $2x \sec^2 x^2$ (C) $-\sec^2 x^2$ (D) $-2x \sec x^2$
17	$\int e^x (\cos x - \sin x) dx = :$ (A) $e^x \sin x + c$ (B) $e^x \cos x + c$ (C) $e^x \tan x + c$ (D) $e^x \cot x + c$
18	If $f(x) = \sin x + \cos x$ then $f(x)$ is : (A) Even function (B) Odd function (C) Neither even nor odd (D) Constant function
19	$\int_0^3 \frac{1}{9 + x^2} dx = :$ (A) $\frac{\pi}{4}$ (B) $-\frac{\pi}{12}$ (C) $-\frac{\pi}{4}$ (D) $\frac{\pi}{12}$
20	$\frac{d}{dx}(f(x) \sin x) = :$ (A) $f(x) \cos x + f'(x) \sin x$ (B) $f'(x) \sin x - f(x) \cos x$ (C) $f'(x) \cos x$ (D) $f'(x) \cos x + f(x) \sin x$