

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 the degree of a polynomial function is 1, then it is called : (A) Identity function (B) Linear function (C) Constant function (D) Trigonometric function
2	$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x^2 - x} = :$ (A) 2 (B) $\frac{1}{2}$ (C) 4 (D) 5
3	If $y = \frac{1}{x^2}$, then $\frac{dy}{dx}$ at $x = -1$ is : (A) 2 (B) 3 (C) $\frac{1}{3}$ (D) 4
4	$\frac{d}{dx}(\cot^{-1} x) = :$ (A) $\frac{1}{1+x^2}$ (B) $\frac{-1}{1+x^2}$ (C) $-\operatorname{cosec}^2 x$ (D) $\sec^2 x$
5	Two positive integer whose sum is 30 and their product will be maximum are : (A) 14, 16 (B) 15, 15 (C) 10, 20 (D) 12, 18
6	$\frac{d}{dx} \left[\frac{f(x)}{g(x)} \right] = :$ (A) $\frac{f(x)g'(x) - f'(x)g(x)}{[g(x)]^2}$ (B) $\frac{f'(x)g(x) - f(x)g'(x)}{[f(x)]^2}$ (C) $\frac{g(x)f'(x) - f(x)g'(x)}{[g(x)]^2}$ (D) $\frac{g'(x)f(x) - g(x)f'(x)}{[g(x)]^2}$
7	$\int \sec x \, dx = :$ (A) $\ln(\sec x + \tan x) + c$ (B) $\ln(\operatorname{cosec} x + \cot x) + c$ (C) $\ln(\sin x + \cos x) + c$ (D) $\sec x + \tan x + c$
8	The solution of differential equation $\frac{dy}{dx} = -y$ is : (A) $y = x e^{-x}$ (B) $y = c e^{-x}$ (C) $y = e^x$ (D) $y = c e^x$
9	$\int_{-1}^3 x^3 \, dx = :$ (A) 20 (B) 40 (C) 30 (D) 60

10	$\int \sin 3x \, dx = :$ (A) $-\frac{\cos 3x}{3} + c$ (B) $\frac{\cos 3x}{3} + c$ (C) $3 \cos 3x + c$ (D) $-3 \cos 3x + c$
11	An equation of the horizontal line through the point P (7 , - 9) is : (A) $y = -9$ (B) $y = 9$ (C) $x = 7$ (D) $x = -7$
12	The perpendicular distance of line $3x + 4y + 10 = 0$ from the origin is : (A) 0 (B) 1 (C) 2 (D) 3
13	Slope of line perpendicular to line $3x - 4y + 5 = 0$ is : (A) $-\frac{3}{4}$ (B) $-\frac{4}{3}$ (C) $\frac{3}{4}$ (D) $\frac{4}{3}$
14	Point of intersection of lines $x - 2y + 1 = 0$ and $2x - y + 2 = 0$ equals : (A) (1 , 0) (B) (0 , 1) (C) (- 1 , 0) (D) (0 , - 1)
15	(0 , 0) is the solution of inequality : (A) $7x + 2y > 3$ (B) $x - 3y > 0$ (C) $x + 2y < 6$ (D) $x - 3y < 0$
16	The condition for a line $y = mx + c$ to be the tangent to the circle $x^2 + y^2 = a^2$ is : (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) $c = \pm m\sqrt{1-a^2}$
17	In an ellipse, the foci lie on : (A) Major axis (B) Minor axis (C) Directrix (D) Z-axis
18	The radius of the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ is : (A) $\sqrt{g^2 + f^2 + c}$ (B) $\sqrt{g^2 - f^2 + c}$ (C) $g + f - c$ (D) $\sqrt{g^2 + f^2 - c}$
19	Length of the vector $2\hat{i} - \hat{j} + 2\hat{k}$ is : (A) 6 (B) 4 (C) 3 (D) 5
20	Cosine of the angle between two non-zero vectors $\underline{a}$ and $\underline{b}$ is : (A) $\underline{a} \cdot \underline{b}$ (B) $\frac{ \underline{a} \underline{b} }{\underline{a} \cdot \underline{b}}$ (C) $\frac{\underline{a} \cdot \underline{b}}{ \underline{a} \underline{b} }$ (D) $\frac{\underline{a} \times \underline{b}}{ \underline{a} \underline{b} }$