

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 that question number. Use marker or pen to fill the circles. Cutting or filling of two or more circles will result in zero mark in that question.

- 1- 1- $\int \sec x \tan x \, dx = ?$
(A) $\sec x + c$ (B) $\sec^2 x + c$ (C) $\tan x + c$ (D) $\ln |\sec x + \tan x| + c$
- 2- The focus of parabola $x^2 = -16y$ is
(A) $(0, -4)$ (B) $(0, 0)$ (C) $(4, 0)$ (D) $(-4, 0)$
- 3- $\int_0^2 |x| \, dx$ is
(A) 0 (B) 1 (C) 2 (D) 4
- 4- Derivative of $y = f(x)$ at $x = a$ represents slope of
(A) tangent line at $x = a$ (B) secant line (C) perpendicular line (D) straight line
- 5- Projection of vector $\underline{v}$ along vector $\underline{u}$ is
(A) $\frac{\underline{u} \cdot \underline{v}}{|\underline{u}|}$ (B) $\frac{\underline{u} \cdot \underline{v}}{|\underline{v}|}$ (C) $\frac{\underline{u} \cdot \underline{u}}{|\underline{u}|}$ (D) $\frac{\underline{v} \cdot \underline{v}}{|\underline{v}|}$
- 6- Which one is true?
(A) $\underline{i} \times \underline{i} = \underline{i}$ (B) $\underline{i} \cdot \underline{i} = \underline{i}$ (C) $\underline{k} \times \underline{k} = 0$ (D) $\underline{k} \times \underline{i} = -\underline{j}$
- 7- Which one equation represents a circle?
(A) $y^2 = 8x$ (B) $3x^2 + 3y^2 = 9$ (C) $3x^2 + 5y^2 = 9$ (D) $x^2 - 2y = 0$
- 8- Which one is point-slope form of a straight line?
(A) $y = mx + c$ (B) $y - y_1 = m(x - x_1)$ (C) $\frac{x}{a} + \frac{y}{b} = 1$ (D) $\frac{x}{a} - \frac{y}{b} = 1$
- 9- Order of differential equation $\frac{d^2 y}{dx^2} + \frac{dy}{dx} - 2x = 0$ is
(A) 1 (B) 0 (C) 2 (D) 3
- 10- The interval in which $f(x) = 4 - x^2$; $x \in (-2, 2)$ is increasing
(A) $(0, 2)$ (B) $(-2, 0)$ (C) $(-2, 2)$ (D) $(0, 1)$
- 11- The function $f(x) = \frac{x^2 - 1}{x - 1}$ is not defined at
(A) $x = 0$ (B) $x = 1$ (C) $x = 2$ (D) $x = -1$
- 12- If $f(x) = x^{2/3}$, the $f'(8)$ is
(A) 3 (B) $\frac{1}{3}$ (C) $\frac{2}{3}$ (D) $\frac{1}{2}$
- 13- $\int \frac{f'(x)}{f(x)} \, dx = ?$
(A) $\ln |x| + c$ (B) $\ln |f(x)| + c$ (C) $\ln |f'(x)| + c$ (D) $\ln f(x) \cdot f'(x) + c$
- 14- Slope of the line passing through the points $(0, -1)$ and $(7, -15)$ is
(A) 2 (B) 0 (C) 1 (D) -2
- 15- $\lim_{x \rightarrow \infty} (e^x) = ?$
(A) ∞ (B) $-\infty$ (C) 1 (D) 0
- 16- $[\underline{u} \cdot \underline{v}] = ?$
(A) 1 (B) -1 (C) 0 (D) $\underline{v}$
- 17- Which point is not solution of inequality $x - 2y \leq 6$
(A) $(1, 1)$ (B) $(0, -1)$ (C) $(14, 0)$ (D) $(-4, 0)$
- 18- Major axis of ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ with $(a > b)$ is
(A) $x = 0$ (B) $y = 0$ (C) $x = 1$ (D) $y = 1$
- 19- Derivative of $\tan^{-1} x$ w.r.t. x is
(A) $\frac{1}{1-x^2}$ (B) $\frac{1}{x^2-1}$ (C) $\frac{1}{1+x^2}$ (D) $1+x^2$
- 20- Distance of line $5x + 12y + 39 = 0$ from origin is
(A) 3 (B) 5 (C) 12 (D) 39