



Roll No. _____ to be filled in by the candidate

(For All Sessions)

(Group-I)

Time: 30 Minutes

Marks: 20

Mathematics (Objective)

Note: Write Answers to the Questions on the objective answer sheet provided. Four possible answers A, B, C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or Pen ink on the answer sheet provided.

- 1.1 $\lim_{x \rightarrow 0} \frac{e^{2x} - 1}{x} = ?$ (A) 1 (B) 2 (C) 0 (D) -2
2. $\cos hx + \sin hx = ?$ (A) e^x (B) e^{-x} (C) e^{2x} (D) $2e^x$
3. $\frac{d}{dx} [\ln(2^x)] = ?$ (A) $\ln 2$ (B) 2^x (C) $\frac{1}{2^x}$ (D) $\frac{\ln 2}{2^x}$
4. $\frac{d}{dx} (\cos hx) = ?$ (A) $-\sin hx$ (B) $\sin hx$ (C) $\operatorname{sech} x$ (D) $\operatorname{cosech} x$
5. If $f(x) = \sqrt{x}$, then $f'(0) = ?$ (A) 0 (B) 1 (C) Undefined (D) $1/2$
6. $\frac{d}{dx} (\sin^{-1} x + \cos^{-1} x) = ?$ (A) 1 (B) 0 (C) -1 (D) 2
7. $\int x dx = ?$ (A) x (B) $1/x$ (C) x^2 (D) x^3
8. $\int e^x(x+1) dx = ?$ (A) $xe^x + c$ (B) $e^x + c$ (C) $x + c$ (D) $x^2 + c$
9. $\int_0^{\pi/2} \cos x dx = ?$ (A) 0 (B) -1 (C) 1 (D) 2
10. $\int \frac{\sin 2x}{\sin x} dx = ?$ (A) $2 \cos x + c$ (B) $2 \sin x + c$ (C) $\frac{1}{2} \sin x + c$ (D) $\frac{1}{2} \cos x + c$
11. The slope of a line $x = 5$ is: (A) 0 (B) 1 (C) -1 (D) Infinite
12. Midpoint of (0, -2) and (-2, 0) is: (A) (0, 0) (B) (-1, -1) (C) (-2, -2) (D) (0, -1)
13. Distance between (-1, 2) & (7, 5) is: (A) $\sqrt{73}$ (B) 7 (C) $2\sqrt{73}$ (D) 73
14. The solution of inequality $x + 2y < 6$ is: (A) (1, 4) (B) (1, 3) (C) (1, 1) (D) (1, 5)
15. Equation of Tangent to $x^2 + y^2 = 4$ at (2, 0) is: (A) $x = 1$ (B) $y = 1$ (C) $y = 2$ (D) $x = 2$
16. Slope of tangent to parabola $y^2 = 4ax$ at $(a, 2a)$ is: (A) 2 (B) -1 (C) 1 (D) 3
17. Eccentricity e of a circle is: (A) $e = 0$ (B) $e = 1$ (C) $0 < e < 1$ (D) $e > 1$
18. Radius of a circle $x^2 + y^2 = 2$ is: (A) 2 (B) 1 (C) $1/2$ (D) $\sqrt{2}$
19. If $P = (2, 3)$, $Q = (6, -2)$, then $|\overline{PQ}|$ is: (A) $\sqrt{40}$ (B) $\sqrt{42}$ (C) $\sqrt{41}$ (D) $\sqrt{43}$
20. For a vector $\vec{V} = 2\hat{i} + 3\hat{j} - 6\hat{k}$, then $\cos \beta = ?$ (A) $\frac{3}{7}$ (B) $\frac{2}{7}$ (C) $-\frac{6}{7}$ (D) $-\frac{3}{7}$