DPP No. : A4 (JEE-MAIN)

Total Marks : 60 **Max. Time : 40 min.**

Single choice Objective ('–1' negative marking) Q.1 to Q.20 **(3 marks 2 min.)** **[60, 40]**

1. If $f(x) = x^3$; $g(y) = y - 1$; $h(z) = z + 1$
The value of $f(g(h(x)))$ is :
(A) $x^3 - 1$ (B) $x^3 + 1$ (C) $x + 1$ (D) x^3

2. If $y = x^3 + 2x^2 + 7x + 8$ then $\frac{dy}{dx}$ will be -
(A) $3x^2 + 2x + 15$ (B) $3x^2 + 4x + 7$ (C) $x^3 + 2x^2 + 15$ (D) $x^3 + 4x + 7$

3. If $y = \frac{1}{x^4}$ then, $\frac{dy}{dx}$ will be :
(A) $\frac{4}{x^3}$ (B) $4x$ (C) $-\frac{4}{x^5}$ (D) $\frac{4}{x^5}$

4. If $y = x^2 \sin x$, then $\frac{dy}{dx}$ will be -
(A) $x^2 \cos x + 2x \sin x$ (B) $2x \sin x$ (C) $x^2 \cos x$ (D) $2 x \cos x$

5. If $y = e^x \cdot \cot x$ then $\frac{dy}{dx}$ will be–
(A) $e^x \cot x - \text{cosec}^2 x$ (B) $e^x \text{cosec}^2 x$
(C) $e^x[\cot x - \text{cosec}^2 x]$ (D) $e^x \cot x$

6. If $y = x \ \ell nx$ then $\frac{dy}{dx}$ will be–
(A) $\ell nx + x$ (B) $1 + \ell n\, x$ (C) ℓnx (D) 1

7. $y = 4 + 5x + 7x^3$. Find $\frac{dy}{dx}$:
(A) $5 - 21x^2$ (B) $5 + 21x^2$ (C) $9 + 7x^2$ (D) $5 + 21x$

8. $y = x + x^2 + \frac{1}{x} + \frac{1}{x^3}$ Find $\frac{dy}{dx}$
(A) $1 + 2x - \frac{1}{x^2} - \frac{3}{x^4}$ (B) $1 + 2x - \frac{1}{x^2} + \frac{2}{x^4}$
(C) $1 - 2x - \frac{1}{x^2} + \frac{3}{x^4}$ (D) $1 + 2x - \frac{1}{x^2} - \frac{3}{x^3}$

9. If $f(x) = x^3 \ell n (x)$
Then f '(x) is :
(A) $x^2 + 3x^2 \ell nx$ (B) $x^2 (1 + \ell nx)$ (C) $4x^2$ (D) None of these

10. If $f(x) = \frac{x+2}{x-2}$
The value f (–1) is
(A) $\frac{1}{3}$ (B) $-\frac{1}{3}$ (C) 3 (D) –3

11. $y = x^2 + \frac{1}{x^2}$ .Find $\frac{dy}{dx}$
(A) $2x - \frac{2}{x^3}$ (B) $2x - \frac{2}{x^4}$ (C) $2x + \frac{2}{x^3}$ (D) None of these

12. $f(x) = \sin^2 x - \cos^2 x$
then the value of f' $\left(\frac{\pi}{4}\right)$
(A) 2 (B) 0 (C) 1 (D) None of these

13. Double differentiation of displacement w.r.t. time is :
(A) acceleration (B) velocity (C) force (D) none of these

14. If $y = x^3$ then $\frac{d^2y}{dx^2}$ is -
(A) $6x^2$ (B) 6x (C) $3x^2$ (D) 3x

15. If $y = 2 \sin^2 \theta + \tan \theta$ then $\frac{dy}{d\theta}$ will be -
(A) $4\sin \theta \cos \theta + \sec \theta \tan \theta$ (B) $2 \sin 2 \theta + \sec^2 \theta$
(C) $4 \sin \theta + \sec^2 \theta$ (D) $2 \cos^2 \theta + \sec^2 \theta$

16. If y = sinx, then $\frac{d^2y}{dx^2}$ will be :
(A) cos x (B) sin x (C) – sin x (D) sin x + C

17. The value of f''(x) at x = 1 for the function $f(x) = x \ell n x$ is
(A) $\ell n2$ (B) 2 (C) 1 (D) 0

18. Find value of $\sin^2 15^o + \sin^2 645^o$:
(A) $\frac{1}{2}$ (B) 1 (C) $\frac{1}{\sqrt{3}}$ (D) None of these

19. Slope of graph y = tanx drawn between y and x, at $x = \frac{\pi}{4}$ is :
(A) 0 (B) 1 (C) 2 (D) $\frac{1}{\sqrt{2}}$

20. $y = \frac{1}{x+1}$. Find $\frac{dy}{dx}$
(A) $-\frac{2}{(x+1)^2}$ (B) $-\frac{1}{(x-1)^2}$ (C) $-\frac{1}{(x+1)^2}$ (D) $\frac{1}{(x+1)^2}$

ANSWER KEY

DPP No. : A4

1.	(D)	**2.**	(B)	**3.**	(C)	**4.**	(A)	**5.**	(C)	**6.**	(B)	**7.**	(B)
8.	(A)	**9.**	(A)	**10.**	(B)	**11.**	(A)	**12.**	(A)	**13.**	(A)	**14.**	(B)
15.	(B)	**16.**	(C)	**17.**	(C)	**18.**	(B)	**19.**	(C)	**20.**	(C)		