

**Answer Ex-I****SINGLE CORRECT (OBJECTIVE QUESTIONS)**

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|-------|-------|-------|-------|-------|-------|-------|
| 1. C  | 2. C  | 3. A  | 4. B  | 5. D  | 6. B  | 7. D  |
| 8. C  | 9. D  | 10. A | 11. C | 12. D | 13. B | 14. C |
| 15. D | 16. C | 17. B | 18. C | 19. A | 20. B | 21. B |
| 22. B | 23. D | 24. B | 25. A | 26. B | 27. D | 28. D |
| 29. C | 30. B | 31. A | 32. B | 33. B | 34. B | 35. C |
| 36. D | 37. D | 38. A |       |       |       |       |

**Answer Ex-II****MULTIPLE CORRECT (OBJECTIVE QUESTIONS)**

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|--------|--------|--------|--------|--------|--------|----------|
| 1. AB  | 2. BC  | 3. AD  | 4. BC  | 5. BC  | 6. ABC | 7. ACD   |
| 8. AD  | 9. AB  | 10. AD | 11. AB | 12. AD | 13. AC | 14. ABCD |
| 15. AB | 16. CD | 17. AB | 18. AC |        |        |          |

**Answer Ex-III****SUBJECTIVE QUESTIONS**

1.  $a \in \mathbb{R}^+$                       3.  $[1 - \sqrt{6}, 1 + \sqrt{6}]$
4. (i) M.D. in  $(-\infty, -3] \cup [0, 2]$                       M.I. in  $(-3, 0] \cup [2, \infty)$
- (ii) M.I. in  $\left[\frac{2}{4n+3}, \frac{2}{4n+1}\right], n \in \mathbb{Z}$                       M.D. in  $\left[\frac{2}{4n+1}, \frac{2}{4n-1}\right], n \in \mathbb{Z}$
- (iii) M.D. in  $\left(0, \frac{1}{\sqrt{3}}\right]$                       M.I. in  $\left[\frac{1}{\sqrt{3}}, \infty\right)$
5.  $(-\infty, -3]$                       6.  $(\pi/6) + (1/2) \cdot \ln 3, (\pi/3) - (1/2) \cdot \ln 3$                       10.  $2 \sin x + \tan x > 3x$ , limit = 0
11.  $[\sqrt{5}, \sqrt{10}]$                       12.  $f(x)$  is injective  $\forall x \in [0, \infty)$
14. increasig when  $x \in \left(\frac{\pi}{4}, \frac{\pi}{2}\right)$                       decreasin when  $x \in \left(0, \frac{\pi}{4}\right)$ .
16.  $a < -(2 + \sqrt{5})$  or  $a > \sqrt{5}$                       17.  $(-\infty, -2) \cup (0, \infty)$                       18.  $\ln(1+x)$
20. Neither increasing nor decreasing at  $x = -1$ , increasing at  $x = 0, 1$ .
21.  $[1, \infty)$                       24.  $[-7, -1] \cup [2, 3]$
26. (a) I in  $(2, \infty)$  & D in  $(-\infty, 2)$                       (b) I in  $(1, \infty)$  & D in  $(-\infty, 0) \cup (0, 1)$
- (c) I in  $(0, 2)$  & D in  $(-\infty, 2) \cup (2, \infty)$                       (d) I for  $x > \frac{1}{2}$  or  $-\frac{1}{2} < x < 0$  & D for  $x < -\frac{1}{2}$  or  $0 < x < \frac{1}{2}$

27.  $(-2, 0) \cup (2, \infty)$
28. (a) I in  $[0, 3\pi/4) \cup (7\pi/4, 2\pi]$  & D in  $(3\pi/4, 7\pi/4)$   
 (b) I in  $[0, \pi/6) \cup (\pi/2, 5\pi/6) \cup (3\pi/2, 2\pi]$  & D in  $(\pi/6, \pi/2) \cup (5\pi/6, 3\pi/2)$   
 (c) I in  $[0, \pi/2) \cup (3\pi/2, 2\pi]$  & D in  $(\pi/2, 3\pi/2)$
29. continuous but not diff. at  $x = 1$
30. (a) Maximum at  $x = 1$  and  $f(-1) = 18$ ; Minimum at  $x = 1/8$  and  $f(1/8) = -9/4$   
 (b)  $2$  &  $-10$
31.  $a \in (-\infty, -3] \cup [1, \infty)$       32.  $0 \leq a \leq \frac{3}{2}$       33.  $\uparrow$  in  $(3, \infty)$  and  $\downarrow$  in  $(1, 3)$
34.  $a \geq 0$
35. (a)  $(-\infty, 0]$  (b)  $\uparrow$  in  $\left(1, \frac{5}{3}\right)$  and  $\downarrow$  in  $(-\infty, 1) \cup \left(\frac{5}{3}, \infty\right) - \{-3\}$  (c)  $x = \frac{5}{3}$   
 (d) removable discont. at  $x = -3$  (missing point) and non removable discont. at  $x = 1$  (infinite type)  
 (e)  $-2$
38.  $(-1, 0) \cup (0, \infty)$       39.  $(b-a)^{3/4}$

**Answer Ex-IV****ADVANCED SUBJECTIVE QUESTIONS**

11.  $c = \frac{mb + na}{m + n}$  which lies between  $n$  &  $b$       16.  $a = 3, b = 4$  and  $m = 1$
17.  $y = -5x - 9$  and  $y = 5x + 11$ .

**Answer Ex-V****JEE PROBLEMS**

1. (a) B ; (b) D ; (c) C      2. (a) A, (b)  $\cos\left(\frac{1}{3}\cos^{-1}p\right)$       3. A      5. (a) D; (b) C
7. D      8. (a) B; (b) (i) B, (ii) A, (iii) A; (c) (A)–P, Q, R ; (B)–P, S ; (C)–R, S ; (D)–P, Q
9. (a) C, (b) A, B, C, D      10. B, C, D      11. B, C