

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

- | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. C | 2. A | 3. D | 4. A | 5. B | 6. C | 7. A | 8. A |
| 9. B | 10. B | 11. C | 12. A | 13. C | 14. A | 15. B | 16. D |
| 17. C | 18. B | 19. B | 20. C | 21. D | 22. A | 23. A | 24. A |
| 25. D | 26. A | 27. A | 28. A | 29. B | 30. B | 31. D | 32. A |
| 33. A | 34. D | 35. C | 36. B | 37. D | 38. B | 39. C | 40. D |
| 41. A | 42. A | 43. B | 44. C | 45. C | 46. A | 47. B | 48. C |
| 49. A | 50. A | 51. D | 52. D | 53. D | 54. B | 55. C | 56. A |
| 57. A | 58. C | 59. A | 60. C | 61. B | 62. B | 63. A | 64. D |
| 65. D | 66. A | 67. D | 68. B | 69. C | 70. B | 71. A | 72. A |
| 73. A | 74. C | 75. B | 76. B | 77. A | 78. C | 79. B | 80. C |
| 81. B | 82. B | | | | | | |

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

- | | | | | | | | |
|-------|--------|----------|--------|--------|---------|-------|---------|
| 1. AC | 2. AC | 3. ABC | 4. ACD | 5. AB | 6. BC | 7. BC | 8. ABCD |
| 9. AC | 10. AB | 11. ABCD | 12. AB | 13. AB | 14. ABC | | |

Answer Ex-III**SUBJECTIVE QUESTIONS**

1. $\begin{bmatrix} 1 & 0 \\ 3 & 2 \\ 5 & 4 \end{bmatrix}$ 2. $(x, y, z, w) = (1, 2, 4, 5)$ 3. $AB = \begin{bmatrix} 18 & -11 & 10 \\ -16 & 47 & 10 \\ 62 & -23 & 42 \end{bmatrix}$, $BA = \begin{bmatrix} 49 & 24 \\ -7 & 58 \end{bmatrix}$
5. (ii) $|A|^{(n-1)^3}$ 6. $a = -4, b = 1, A^{-1} = \begin{bmatrix} 1 & -2 \\ -1 & 3 \end{bmatrix}$ 7. $\begin{bmatrix} 9 & -3 & 5 \\ -2 & 1 & 0 \\ 1 & 0 & 2 \end{bmatrix}$ 8. $\begin{bmatrix} -191 & -110 \\ 77 & 44 \end{bmatrix}$
11. $A^{-1} = \frac{2}{39} \begin{bmatrix} 26 & -13 & 13 \\ -17 & 10 & -1 \\ 7 & -11 & 5 \end{bmatrix}$ 12. $\alpha \in \mathbb{R} - \left\{0, \frac{6}{5}\right\}$ 13. Rs. 2, Rs. 15 & Rs. 5.
14. (i) $x = 2; y = 2; z = 2$ (ii) $x = -2; y = 7; z = 3$ 15. $x = 1; y = 2; z = 3$
17. $x = \pm \frac{1}{\sqrt{2}}, y = \pm \frac{1}{\sqrt{6}}, z = \pm \frac{1}{\sqrt{3}}$ 18. $A^{-1} = -\frac{1}{7} \begin{bmatrix} -4 & 3 & 17 \\ -3 & 4 & 11 \\ -1 & -1 & -1 \end{bmatrix}$ & $x = 2, y = -3, z = 2$
19. $x = 4, y = -3$ & $z = 1$ 20. $a = 1, b = 4$ 22. $-2, 0$ 23. $A = 0, B = 0$
26. (a) $\lambda \neq 3$ (b) $\lambda = 3, \mu = 10$ (c) $\lambda = 3, \mu \neq 10$

Answer Ex-IV**ADVANCED SUBJECTIVE QUESTIONS**

1. $EF = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$, $FE = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ 2. 8 3. $x = \frac{3}{2}$, $y = 2$ 5. $V = \begin{bmatrix} 0 \\ 1 \\ 11 \end{bmatrix}$ 7. 1
8. $f(a) = 1/4$, $a = 1/2$ 10. $\alpha = \pm \frac{1}{\sqrt{2}}$, $\beta = \pm \frac{1}{\sqrt{6}}$, $\gamma = \pm \frac{1}{\sqrt{3}}$ 11. $\left(-\frac{4\sqrt{2}}{3}, \frac{2}{3}, 2\sqrt{2}\right), \left(\frac{4\sqrt{2}}{3}, \frac{2}{3}, -2\sqrt{2}\right), (3, 3, -1)$
12. 2 14. $\begin{bmatrix} 1 & 0 & 0 \\ 2 & 3 & 0 \\ -1 & 0 & 4 \end{bmatrix} + \begin{bmatrix} 0 & 2 & 5 \\ 0 & 0 & -6 \\ 0 & 0 & 0 \end{bmatrix}; \begin{bmatrix} 1 & 2 & 2 \\ 2 & 3 & -3 \\ 2 & -3 & 4 \end{bmatrix} + \begin{bmatrix} 0 & 0 & 3 \\ 0 & 0 & -3 \\ -3 & 3 & 0 \end{bmatrix}$ 15. 4 16. 650
17. $f = -(a + d)$; $g = ad - bc$ 18. 225 19. $\begin{bmatrix} 17 & 4 & -19 \\ -10 & 0 & 13 \\ -21 & -3 & 25 \end{bmatrix}$ 20. $\begin{bmatrix} -4 & 7 & -7 \\ 3 & -5 & 5 \end{bmatrix}$
21. (i) $\begin{bmatrix} \cos \alpha & \sin \alpha & 0 \\ -\sin \alpha & \cos \alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$, (ii) $\frac{1}{3} \begin{bmatrix} 1 & 1 & 1 \\ 1 & w^2 & w \\ 1 & w & w^2 \end{bmatrix}$ (iii) $\begin{bmatrix} 1/a & 0 & 0 \\ 0 & 1/b & 0 \\ 0 & 0 & 1/c \end{bmatrix}$ 24. $\frac{1}{13} \begin{bmatrix} -12 & -5 \\ 5 & -12 \end{bmatrix}$
25. (i) $x = 2$, $y = 1$, $z = 0$; (ii) $x = 1$, $y = 2$, $z = 3$; (iii) $x = 2 + k$, $y = 1 - 2k$, $z = k$ where $k \in \mathbb{R}$; (iv) inconsistent, hence no solution
26. $x_1 = 1$, $x_2 = -1$, $x_3 = 1$ 27. $\frac{1}{19} \begin{bmatrix} 48 & -25 \\ -70 & 42 \end{bmatrix}$ 28. $\frac{1}{kn - lm} \begin{bmatrix} n & -m \\ -l & k \end{bmatrix}$
29. (i) $X = \begin{bmatrix} a & b \\ 2-2a & 1-2b \end{bmatrix}$ for $a, b \in \mathbb{R}$; (ii) X does not exist; (iii) $X = \begin{bmatrix} a & -3a \\ c & -3c \end{bmatrix}$ $a, c \in \mathbb{R}$ and $3a + c \neq 0$
30. $x = 2$, $y = 1$, $z = -1$ 31. $X = \begin{bmatrix} -2c & -2d \\ c & d \end{bmatrix}$, where $c, d \in \mathbb{R} - \{0\}$, No
32. (i) $a \neq -3$, $b \in \mathbb{R}$; (ii) $a = -3$ and $b \neq 1/3$; (iii) $a = -3$, $b = 1/3$
33. (a) $X = \begin{bmatrix} -3 & -3 \\ 5/2 & 2 \end{bmatrix}$ (b) $X = \begin{bmatrix} 1 & 2 \\ -1 & -2 \end{bmatrix}$, (c) no solution

Answer Ex-V**JEE PROBLEMS**

1. (a) A 2. D 4. $r = 2$; $x = k$; $y = \frac{k}{7}$; $z = -k$ where $k \in \mathbb{R} - \{0\}$ 5. $x = n\pi$, $n \in \mathbb{I}$
6. If $\lambda = 5$, system is consistent with infinite solution given by $z = K$, $y = \frac{1}{2}(3K + 4)$ and $x = -\frac{1}{2}(5K + 2)$ where $K \in \mathbb{R}$;
If $\lambda \neq 5$, system is consistent with unique solution given by $z = \frac{1}{3}(1 - \lambda)$; $x = \frac{1}{3}(\lambda + 2)$ and $y = 0$.
8. B 9. 4 10. D 11. A 14. C 15. A 16. (a) A, (b) B, (c) A
17. (a) D; (b) A 18. (A)-R; (B)-Q, S; (C)-R, S; (D)-P, R 19. (a) A, (b) B, (c) B
20. A 21. (a) D, (b) C, (c) D 22. 4 23. C 24. 0009 25. D
26. D 27. A, D