

: : ANSWER KEY : :

ANSWER Ex-I**(OBJECTIVE PROBLEMS)**

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

ANSWER Ex-II**(SUBJECTIVE PROBLEMS)**

1. (i) hollow sphere > solid sphere, (ii) hollow sphere = solid sphere
2. (a) 450 (b) 449 (c) 12 : 14 : 59 (d) (i) 1 (ii) $\frac{900}{451} \text{ s}$ (iii) $\frac{1}{450 \times 10^{-5}} \text{ s}$
3. (a) $h^1 = h \{1 + \alpha_c \Delta\theta\}$, $A^1 = A \{1 + 2\alpha_s \Delta\theta\}$, $v^1 = Ah \{1 + 3\alpha_s \Delta\theta\}$
 volume of liquid $V_w = Ah_1(1 + \gamma_L \Delta\theta)$
 (b) $h^1 = h \{1 + \gamma_L \Delta\theta\}$ (c) (i) $\gamma_L < 3\alpha_c$ (ii) $\gamma_L > 3\alpha_c$ (iii) $\gamma_L = 3\alpha_c$.
 (d) $\Delta V = Ah (\gamma_L - 3\alpha_c) \Delta\theta$ (e) $3h\alpha_c = h_1\gamma_L$
 (f) (i) $h_1 (1 - 3\alpha_c \Delta\theta)$, (ii) $h_1(1 + \gamma_L \Delta\theta)$, (iii) (1) $\gamma_L > 2\alpha_c$ (2) $\gamma_L < 2\alpha_c$ (3) $\gamma_L = 2\alpha_c$.
4. $Y_R = \left(\frac{1}{9} + 27 \times 37 \times 10^{-6} \right) / ^\circ\text{C}$ 5. (a) $V_0 d_0 g \left(\frac{1 + 3\alpha_s \Delta\theta}{1 + \gamma_L \Delta\theta} \right)$ (b) (i) $\gamma_L < 3\alpha_s$ (ii) $\gamma_L > 3\alpha_s$ (iii) $\gamma_L = 3\alpha_s$.
6. 5 sec slow 7. 10000 N 8. $4 \times 10^{-6} \text{ m/}^\circ\text{C}$ 9. $5\alpha/3$ 10. $h/5R$ 11. $3V/20$ 12. 10 cm, 40 cm
13. (a) All tie (b) 50°X , 50°Y , 50°W . 14. -40°C or -40°F

ANSWER Ex-III**(JEE PROBLEMS)**

1. $2 \times 10^{-4} \text{ C}$ 2. B,D 3. A 4. $\gamma_l = 2\alpha_s$ 5. 4