:: ANSWER KEY ::

Exercise-I

1.	D	**2.**	A	**3.**	C	**4.**	B	**5.**	A	**6.**	D
7.	A	**8.**	B	**9.**	C	**10.**	D	**11.**	C	**12.**	A
13.	B	**14.**	(a) A (b) D	**15.**	B	**16.**	B	**17.**	A	**18.**	C
19.	C	**20.**	A	**21.**	C	**22.**	B	**23.**	A	**24.**	D
25.	A	**26.**	B	**27.**	C	**28.**	B	**29.**	C	**30.**	C
31.	A	**32.**	A	**33.**	A	**34.**	A	**35.**	B	**36.**	B
37.	A	**38.**	C	**39.**	A	**40.**	A	**41.**	B	**42.**	A
43.	D	**44.**	B	**45.**	D	**46.**	B	**47.**	A	**48.**	C
49.	B	**50.**	D	**51.**	B	**52.**	B	**53.**	B	**54.**	A
55.	A	**56.**	C								

Exercise-II

1.	CD	**2.**	ABC	**3.**	ABD	**4.**	AB	**5.**	ABCD	**6.**	CD
7.	D	**8.**	D	**9.**	A,C	**10.**	A,B	**11.**	D	**12.**	A,B
13.	A,B,CD	**14.**	B								

Exercise-III

1. H = 590 Kcal. **2.** 136 km **3.** 8.6×10^{-3} °C **4.** $\Delta\theta = \frac{315}{11}$°C = 28.66°C

5. $L_B > L_A = L_C$ **6.** $S_A = S_B > S_C > S_D$ **7.** $\frac{1050}{2.27}$ sec. = 7.7 min

8. 25.5°C **9.** 4°C **10.** 27/85

11. 0°C, 125/4 g ice, 1275/4 g water **12.** (i) 0.02 kg, (ii) 40,000 cal kg^{-1}, (iii) 750 cal kg^{-1} K^{-1}

13. 64 J **14.** 5×10^{-5} g/s **15.** 4.0 W **16.** 2 : π

17. 10 cm from end in contact with water at

18. $\frac{t_1 + t_2 + t_3}{\frac{t_1}{k_1} + \frac{t_2}{k_2} + \frac{t_3}{k_3}}$ **19.** 65°C **20.** 5°C **21.** 4/3 ω

22. 15 W/m–°C **23.** $\frac{K\pi r_1 r_2(\theta_2 - \theta_1)}{L}$

24. 12 °C/s **25.** 1800 J **26.** 10 sec **27.** $(6/\pi)^{1/3}$ **28.** 2 : 1 **29.** 3025 K **30.** 80 Watt.

31. 1700 K **32.** 0.3 **33.** 15°C

34. 6×10^3 K ; 4×10^3 K **35.** 7.31×10^{10} erg/cm^2 sec. **36.** $\lambda_m = 3$ μm

37. 7 minutes. **38.** 34°C

Exercise-IV

1. 1 : 1.26 **2.** 800 cal kg^{-1} K^{-1}, 1000 cal kg^{-1} K^{-1} **3.** (a) 37.8 J/s (Watts), (b) 2.005 N-m

4. 5000 J/°C kg **5.** 45°C **6.** $K_{11} > K_{\perp}$, $K_{\parallel} = \frac{K_A + K_B}{2}$, $K_{\perp} = \frac{2K_AK_B}{K_A + K_B}$

7. $\frac{a^2 s}{2K}\log_e\left(\frac{b}{a}\right)\log_e\left(\frac{T_0 - T_1}{T_0 - T_2}\right)$ **8.** $\frac{l_1}{l} = \frac{k(T_1 - T_m)}{k(T_1 - T_m) + (T_m - T_2)}$ **9.** (a) –100°C/m, (b) 1000 J

10. 166.3 sec **11.** 9.72°C/min **12.** $T_A = 423K$ **13.** T'' = $\sqrt[4]{2}$ × 500 = 600 K

14. 10 minutes **15.** (i) 74 cm, (ii) 73.94 cm, (iii) 69.52 cm

16. (i) $p_1 = p_{H_2} \simeq 1.25 \times 10^6$ Pa ; $p_2 = p_{H_2} + p_{O_2} + p_{N_2} \simeq 2.8125 \times 10^6$ Pa ; $p_3 = p_{H_2} + p_{N_2} \simeq 1.5625 \times 10^6$ Pa

17. 60°C

Exercise-V

1. 12 gm **2.** 60°C **3.** 41.53 Watt; 26.48 °C ; 0.55 °C **4.** D **5.** 5.5 min

6. $k = \frac{\log_e 2}{t_1}$; $T = 300 + 50\exp.\left[-\left\{\frac{KA}{LC} + \frac{\log_e 2}{t_1}\right\}2t_1\right]$ **7.** D **8.** A

9. B **10.** B **11.** D **12.** 0.5 kg **13.** A **14.** A

15. (a) 595 watt/m^2, (b) $T_0 \approx 420K$ **16.** B **17.** D **18.** C

19. $\gamma_l = 2\alpha_s$ **20.** $\frac{K}{4e\sigma LT_S^3 + K}$ **21.** A **22.** C **23.** A **24.** A **25.** B **26.** A,D **27.** 273K

28. (A) S, Q ; (B) Q ; (C) P, Q ; (D) Q, R **or** (A) S, (B) Q, (C) P, (D) R **29.** 9 **30. 8 g** **31. C**