

**KANTIPUR ENGINEERING COLLEGE**  
**Dhapakhel, Lalitpur**  
**Model Entrance Test (2074)**

**Solution Set: II (B)**

**Section I**

- |   |         |         |         |         |
|---|---------|---------|---------|---------|
| 1. (D)  | 2. (B)  | 3. (C)  | 4. (A)  | 5. (A)  |
| 6. (B)  | 7. (C)  | 8. (D)  | 9. (B)  | 10. (D) |
| 11. (A)   | 12. (C) | 13. (C) | 14. (A) | 15. (B) |
| 16. (D) Hint: $\log_a m^{x^n} = \frac{n}{m} \log_a x$             |         |         |         |         |
| $y = \log_{x^{1/2}} x = \frac{1}{\frac{1}{2}} \log_x x = 2$       |         |         |         |         |
| 17. (A)   |         |         |         |         |
| 18. (A) Hint: $x = \sqrt{2+x} \Rightarrow x^2 = 2+x$              |         |         |         |         |
| 19. (C) Hint: $ \text{adj. } A  =  A ^{n-1}$                      |         |         |         |         |
| 20. (C) Hint: A (a, 0, 0), B(0, b, 0), C(0, 0, c)                 |         |         |         |         |
| $\alpha = \frac{a}{3}, \beta = \frac{b}{3}, \gamma = \frac{c}{3}$ |         |         |         |         |
| $\Rightarrow a = 3\alpha, b = 3\beta, c = 3\gamma$                |         |         |         |         |
| 21. (D)   | 22. (D) | 23. (B) | 24. (B) | 25. (D) |
| 26. (B)   | 27. (C) | 28. (A) | 29. (D) | 30. (D) |
| 31. (D)   | 32. (A) | 33. (A) | 34. (A) | 35. (C) |
| 36. (C)   | 37. (C) | 38. (B) | 39. (B) | 40. (B) |
| 41. (B)   | 42. (A) | 43. (C) | 44. (D) | 45. (D) |
| 46. (A)   | 47. (C) | 48. (B) | 49. (B) | 50. (D) |
| 51. (C)   |         |         |         |         |
| 52. (A)   |         |         |         |         |

**Solution**

9.8 g of  $\text{H}_2\text{SO}_4 = 4.8$  g of metal

49 g (gram eq.wt. of  $\text{H}_2\text{SO}_4$ ) =  $4.8 / 9.8 \times 49 = 24$  g ( gram equivalent wt.) of the metal

Equivalent weight of the metal =24

53. (D)                      54. (B)                      55. (A)                      56. (C)                      57. (C)  
 58. (A)                      59. (B)                      60. (D)

**Section II**

61. (B)                      62. (D)

63. (C) Hint:  $\vec{a} + \vec{b} = -\vec{c}$

$$\Rightarrow (\vec{a} + \vec{b})^2 = (\vec{c})^2$$

$$\Rightarrow |\vec{a}|^2 + |\vec{b}|^2 + 2\vec{a}\cdot\vec{b} = |\vec{c}|^2$$

64. (B) Hint: Domain :  $4x - x^2 \geq 0$   
 Range : Min. = 0,      Max. = 2

65. (B)

Solution:  $\frac{r_1}{r^2} = \frac{\Delta/s-a}{\Delta/s-a} = \frac{s-b}{s-a}$

$$\frac{r_1}{r_3} = \frac{s-c}{s-a}$$

$$\left(1 - \frac{r_1}{r_2}\right) \left(1 - \frac{r_1}{r_3}\right) = 2 \text{ gives } a^2 = b^2 + c^2$$

66. (D)                      67. (A)                      68. (C)                      69. (A)

70. (A) Hint:  $6! - 5! = 600$

71. (C) Hint:  $\log(1+x+x^2) = \log \frac{\{(1-n)(1+x+x^2)\}}{1-x} = \log(1-x^3) - \log(1-x)$

72. (B)

73. (C)

Solution:  $\frac{1}{30}, \frac{1}{24}, \frac{1}{20}$  are in A.P.

$$d = \frac{1}{120}$$

$$\text{next term} = \frac{1}{20} + \frac{1}{120} = \frac{7}{120}$$

$$\text{next term of H.P} = \frac{120}{7}$$

74. (B)                      75. (D)                      76. (D)

77. (D)

**Solution:**  $x^1(x) = f^1(x) - f^1(-x) = 0$   
 $f^1(x) = f^1(-x)$

78. (A)

79. (C)

80. (B)

81. (B)

82. (D)

**Solution:**  $R = \sqrt{Rx^2 + Ry^2} \Rightarrow R^2 = Rx^2 + Ry^2$   
 $R_x = \sqrt{R^2 - Ry^2} = \sqrt{(20)^2 - (12)^2} = 16 \text{ N}$

83. (C) **Solution:** Since  $KI = \text{content}$

$$K^1 \cdot 1/2 = kI$$
$$\therefore k^1 = 2k$$

84. (A) **Solution:**  $T = (L_f - L_i)/t = (4L_0 - L_0)/4 = 3/4 L_0$

85. (A) **Solution:**  $f = f \frac{v - \vartheta_0}{v - \vartheta_s} = 140 \text{ Hz}$

86. (D)

**Solution:**  $\frac{\text{Scale reading} - LFP}{UFP - LFP} = \cos \theta$   
 $\Rightarrow \frac{c - 0}{100 - 0} = \frac{59 - 5}{95 - 5} \Rightarrow c = 60^\circ$

87. (B) **Solution:**  $p = \frac{mlf}{t} = \frac{60 \times 80 \times 4.2}{60} = 336 \text{ sec}$

88. (C) **Solution:**  $E_x = \frac{dv}{dy} \Big|_{x=0, y=0, z=0} = 6 \text{ V/m}$

$$E_y = \frac{dv}{dy} \Big|_{x=0, y=0, z=0} = -8 \text{ V/m}$$

$$E_z = \frac{dv}{dz} \Big|_{x=0, y=0, z=0}$$

$$E = \sqrt{E_x^2 + E_y^2 + E_z^2} = 10 \text{ V/m}$$

$$\therefore F = qE = 2 \times 10 = 20 \text{ N}$$

89. (D) **Solution:**  $U = \frac{1}{2} q v = \frac{1}{2} \times 200 \times 0.1 = 10 \text{ J}$

90. (D)

**Solution:**

Let R be the resistance of each wire

In series, heat produced is  $Q_1 = \mathcal{E}^2 / 2R$

In parallel, heat produced is  $Q_2 = \mathcal{E}^2 / R/2$

$$\therefore \frac{Q_1}{Q_2} = \frac{1}{4} = 1:4$$

91. (C) Hint: since  $\beta \propto \frac{1}{r}$

92. (B)

Hint:  $w = \frac{1}{\sqrt{LC}} 50 \text{ rad/s}$

93. (B)

Hint:  $\mu = \sin\left(\frac{A + Dm}{2}\right) / \sin A/2$

94. (A)

Hint:  $\beta^1 = \frac{\lambda D}{d^1 \mu} = \frac{\lambda D}{\frac{d}{2} \cdot \mu} = \frac{2\beta}{4/3} = \frac{3}{2} \beta$

95. (C)

**Solution:**

In This reaction, the energy released will be in the form of heat energy

$$\begin{aligned} \text{Energy released} &= \text{Binding energy of } 2 \text{ H}_e^4 \text{ minus twice the binding energy of } 1 \text{ H}_2 \\ &= 28 = 2 \times 2.2 = 23.6 \text{ Mev} \end{aligned}$$

96. (A)

**Solution:**

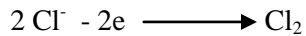
Here  $\frac{N}{N_0} = \frac{1}{4}$

$$\frac{1}{4} = \left(\frac{1}{2}\right)^{t/T} \Rightarrow \frac{t}{T} = 2$$

$$\therefore t = 2T = 2 \times 4 = 8 \text{ months.}$$

97. (D)

**Solution:**



$$2F = 22.4 \text{ litres at NTP}$$

$$\text{For } 2.24 \text{ lit } Q = 2 / 22.4 \times 2.24 = 0.2F = 0.2 \times 96500 \text{ C}$$

$$I = Q / t = 0.2 \times 96500 / 60 \times 60 = 5.36 \text{ amp}$$

98. (B)

**Solution:**  $V_1 = 0.6 \text{ litres} = 1000 \times 0.6 \text{ ml} = 600 \text{ ml}$  ;  $S_1 = 0.205 \text{ N}$   
 $S_2 = 0.1 \text{N}, V_2 = ?$

We know  $V_1 S_1 = V_2 S_2$

$$V_2 = V_1 S_1 / S_2 = 600 \times 0.205 / 0.1 = 1230 \text{ ml}$$

The amount of water =  $(1230 - 600) \text{ ml} = 630 \text{ ml}$

99. (C)

100. (A)

\*\*\*\*\*