



Monthly Progressive Test

Class: XI

Subject: PCMB

SOLUTION

Physics

1. (B)

In series: $10 + 10 + 10 = 30$ ohm, 10 ohm & 30 ohm are in parallel, therefore equivalent

$$\text{resistance} = \frac{(30 \times 10)}{(30 + 10)} = \frac{15}{2} \text{ ohm}$$

$$\text{Apply Ohms law, } 3 = i \left(\frac{15}{2} \right) \Rightarrow i = 0.4A$$

2. (B)

$$2.5 \text{ ohm} \longrightarrow 120 \text{ cm}$$

$$5 \text{ ohm} \longrightarrow 240 \text{ cm}$$

3. (C)

Potential difference remains same

4. (B)

In series connection current remains same

5. (B)

$$P = \frac{V^2}{R} \Rightarrow 100 = \frac{(220)^2}{R} = 4 \times \frac{(110)^2}{R}$$

$$\text{Therefore } 25 = \frac{(110)^2}{R}$$

6. (D)

Real, inverted, diminished

7. Ⓑ

By definition

8. Ⓒ

By definition

9. Ⓓ

Apply $R = 2f$

10. Ⓒ

 28° (alternate angle)

11. Ⓐ

hertz

12. Ⓑ

Apply, speed of sound = frequency \times wavelength

13. Ⓒ

$$\frac{330}{100} = 3.3 \text{ m}$$

14. Ⓓ

As sound can't travel in free space

15. Ⓑ

20Hz to 20kHz

16. Ⓒ

$$\text{Apply } \left[\frac{(u+v)}{2} \right] \times t = s \Rightarrow 3t = 30, \text{ therefore } t = 10\text{s}$$

17. Ⓓ

$$\frac{[(0+10) \times 5]}{2} = 25 \text{ m}$$

18. Ⓑ

Apply $v = u + at$ with $u = 0 \text{ m/s}$, $v = 10 \text{ m/s}$, $t = 5 \text{ s}$, we get $a = 2 \text{ m/s}^2$

19. Ⓒ

$$s = \left(\frac{1}{2} \right) at^2 \Rightarrow s = 6 \text{ m}$$

20. (B)

$$\text{Speed} = \frac{(x+x)}{\left[\left(\frac{x}{u}\right) + \left(\frac{x}{v}\right)\right]} = \frac{2uv}{(u+v)}$$

21. (A)

—————→ uniform magnetic field
 —————→

22. (B)

Will be magnetized

23. (C)

Pattern of bar magnet and solenoid are identical.

24. (C)

Current reversal, reverses the polarity

25. (D)

Concentric circles

Chemistry

26. (B)

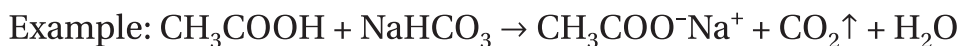
-COOH is carboxylic acid functional group, -CHO is aldehyde functional group,
 -OH is alcohol functional group, -COCl is acid chloride functional group

27. (D)

Diamond, graphite, fullerene all are crystalline allotropes of carbon and gas carbon is the amorphous allotrope.

28. (C)

Decarboxylation reaction is associated with carboxylic acid functional group and the related equation is given below



29. (C)

 CH_4 — methane, $\text{H}_3\text{C} - \text{CH}_3$ — ethane, $\text{H}_2\text{C} = \text{CH}_2$ - ethene, $\text{HC} \equiv \text{CH}$ - ethyne

30. Ⓓ

Isopropyl group is $(\text{CH}_3)_2\text{CH}-$

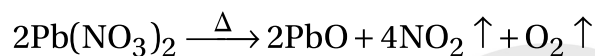
Some examples are $(\text{CH}_3)_2\text{CH}-\text{OH}$ is isopropyl alcohol, $(\text{CH}_3)_2\text{CH}-\text{Br}$ is isopropyl bromide

31. Ⓒ

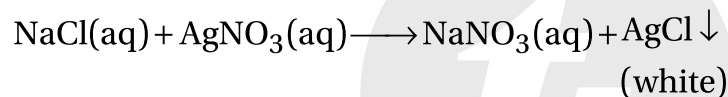
e.s.u - CGS unit of electric charge, Joule - SI unit of energy, Coulomb - SI unit of charge, Watt - SI unit of power

32. Ⓐ

It is a decomposition reaction as a larger compound is decomposed and turns into smaller compounds. This reaction is going on when temperature is increased. Hence it is an example of thermal decomposition. The equation is given below :



33. Ⓒ



In this reaction, both anion and cations are replaced and hence it is an example of double displacement reaction

34. Ⓑ

Endothermic reaction : The reactions in which heat is absorbed known as endothermic reaction

Exothermic reaction : The reaction in which heat is released known as exothermic reaction

35. Ⓓ

The correct unit of pressure is Newton.metre^{-2}

36. Ⓒ



37. Ⓑ



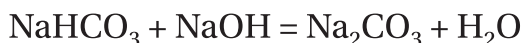
38. Ⓓ

Homologous series : The compounds of same general formula, having same functional group and differ by one $-\text{CH}_2-$ group known as homologs to each other.



39. ©

Acid salts contain one acidic hydrogen atom and can further react with base. Related equation is



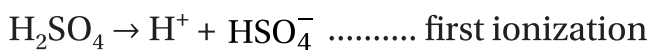
40. Ⓓ

Oxyacids : Acids having both hydrogen and oxygen along with other elements.

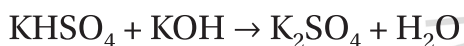
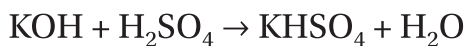
Oxygen is absent in hydrochloric acid (HCl), hence it is not an oxyacid

41. ©

Dibasic acid : The acid that can release two H^+ ions on ionization. The ionization processes are given below



an example is given below



42. Ⓓ

In NaOH, KOH, $\text{Ca}(\text{OH})_2$ contain strong metals and hence these are strong bases. But, NH_4OH does not contain any strong metal and hence it is a weak base.

43. ©

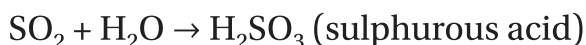
Milk of magnesia is an antacid and it contains $\text{Mg}(\text{OH})_2$

44. Ⓓ



45. Ⓑ

CH_4 , O_2 and N_2 cannot react with water. But SO_2 is an acidic oxide and can react with water to form acidic solution. The equation is given below



46. Ⓑ

According to mole concept

22.4L O₂ gas at STP → 32 gm O₂

$$\therefore 0.112 \text{ L O}_2 \text{ gas at STP} \rightarrow \left[\frac{32 \times 0.112}{22.4} \right] = 0.16 \text{ gm}$$

47. (B)

According to mole concept

32 gm O₂ → 6.02 × 10²³ molecules

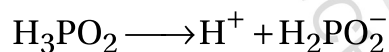
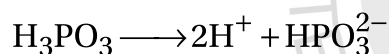
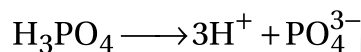
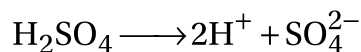
$$\therefore 6.4 \text{ gm O}_2 \rightarrow \left[\frac{6.4 \times 6.02 \times 10^{23}}{32} \right] = 12.04 \times 10^{22} \text{ molecules}$$

48. (D)

According to mole concept

0.448 L N₂ gas is equal to $\frac{0.448}{22.4} = 0.02$ mole N₂

49. (D)



50. (B)

$$0.03 \text{ mole H}_2\text{SO}_4 = (98 \times 0.03) = 2.94 \text{ gm H}_2\text{SO}_4$$

Mathematics

51. (B)

$$\sqrt{4} < \sqrt{5} < \sqrt{6.25}$$

52. (A)

$$\sqrt{3-2\sqrt{2}} = \sqrt{(\sqrt{2}-1)^2} = \sqrt{2}-1$$

53. (C)

$$x = 7 + 4\sqrt{3}, \frac{1}{x} = \frac{1}{7+4\sqrt{3}} = 7 - 4\sqrt{3}, \frac{1}{y} = x = 7 + 4\sqrt{3}$$

$$\frac{1}{x^2} + \frac{1}{y^2} = (7-4\sqrt{3})^2 + (7+4\sqrt{3})^2 = 2(49+48) = 194$$

54. Ⓓ

$$2^x = 3^y = 6^{-z} = k, 2^x = k \Rightarrow 2 = k^{\frac{1}{x}}, 3 = k^{\frac{1}{y}}, 6 = k^{\frac{-1}{z}} \Rightarrow$$

$$2 \times 3 = k^{\frac{-1}{z}} \Rightarrow k^{\frac{1}{x}} \times k^{\frac{1}{y}} = k^{\frac{-1}{z}} \Rightarrow k^{\frac{1}{x} + \frac{1}{y}} = k^{\frac{-1}{z}} \Rightarrow \frac{1}{x} + \frac{1}{y} = \frac{-1}{z} \Rightarrow \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$$

55. Ⓑ

$$\frac{1}{1+x^{a-b}} + \frac{1}{1+x^{b-a}} = \frac{x^b}{x^b+x^a} + \frac{x^a}{x^a+x^b} = \frac{x^b+x^a}{x^b+x^a} = 1$$

56. Ⓑ

$$p(x) = x^2 - 2\sqrt{2}x + 1 \Rightarrow p(2\sqrt{2}) = (2\sqrt{2})^2 - 2\sqrt{2}(2\sqrt{2}) + 1 = 8 - 8 + 1 = 1$$

57. Ⓑ

$$p(x) = x^3 + 7kx^2 - 4kx + 12, p(-3) = (-3)^3 + 7k(-3)^2 - 4k(-3) + 12 = 0$$

$$\Rightarrow -27 + 63k + 12k + 12 = 0 \Rightarrow 75k = 15 \Rightarrow k = \frac{1}{5}$$

58. Ⓓ

6^n ends with 6 and 5^n ends with 5. So, $6^n - 5^n$ ends with 1

59. Ⓑ

$$p(x) = 2x^2 + 2ax + 5x + 10, p(-a) = 2(-a)^2 + 2a(-a) + 5(-a) + 10 = 0$$

$$\Rightarrow 2a^2 - 2a^2 - 5a + 10 = 0 \Rightarrow a = 2$$

60. Ⓒ

$$x^2 - 2x - 3 = (x-3)(x+1) \text{ one zero is } -1$$

61. Ⓒ

The quadratic polynomial having zeroes 1 and -2 is $x^2 + x - 2$

62. Ⓑ

$$\alpha + \beta = 5, \alpha\beta = k, \alpha - \beta = 1$$

$$(\alpha - \beta)^2 = (\alpha + \beta)^2 - 4\alpha\beta \Rightarrow 1 = 25 - 4k \Rightarrow 4k = 24 \Rightarrow k = 6$$

63. Ⓑ

Graph of $y = x^2 - 3x - 4$ will be parabola.

64. ©

$$\frac{3}{6} = \frac{-1}{-k} = \frac{8}{16} \Rightarrow \frac{1}{k} = \frac{1}{2} \Rightarrow k = 2$$

65. (A)

$$\frac{1}{3} = \frac{2}{k} \Rightarrow k = 6$$

66. (A)

$$\frac{3}{4} \neq \frac{4}{-6} \Rightarrow \text{equations have unique solution}$$

67. (B)

$$\frac{x}{4} + \frac{y}{3} = \frac{5}{12} \Rightarrow 3x + 4y = 5, x + 2y = 2$$

$$\text{Solving, } x = 1 \text{ and } y = \frac{1}{2} \cdot x + y = \frac{3}{2}$$

68. ©

$$16k^2 = 4 \times 16 \times 9 \Rightarrow k^2 = 36 \Rightarrow k = \pm 6$$

69. (A)

$$\text{One root is reciprocal to other} \Rightarrow \alpha\beta = 1 \Rightarrow \frac{\lambda - 4}{4} = 1 \Rightarrow \lambda = 8$$

70. (B)

$$\alpha + \beta = \frac{1}{2}\alpha\beta \Rightarrow (k + 6) = (2k - 1) \Rightarrow k = 7$$

71. (D)

$$2^2 - a \times 2 + 12 = 0 \Rightarrow a = 8$$

$$x^2 + 8x + q = 0, \text{ for equal roots } 4q = 64 \Rightarrow q = 16$$

72. (A)

$$16 - 4k > 0 \Rightarrow 4 > k$$

73. (D)

$$b^2 = 4ac \Rightarrow c = \frac{b^2}{4a}$$

74. ©

$$x^2 - 5x - 6 = (x - 6)(x + 1) \Rightarrow x = 6 \text{ \& } x = -1$$

75. (A)

one root = $3 + 2\sqrt{3}$, another root must be $3 - 2\sqrt{3}$

The equation is $x^2 - 6x - 3 = 0$

Biology

76. (B)

A little room

77. (B)

Organelles

78. (A)

Bacteria

79. (C)

Mitochondria

80. (A)

Hypotonic

81. (C)

Increasing the width of stem

82. (B)

Parenchyma

83. (B)

Four

84. (C)

Cuboidal epithelium

85. (C)

Cardiac

86. (A)

Carbon dioxide is reduced to carbohydrate

87. (D)

Buccal cavity

88. Ⓓ
Parasites
89. Ⓐ
Carbon dioxide and water
90. Ⓒ
The trachea is surrounded by incomplete rings of ligament
91. Ⓐ
Right atrium
92. Ⓒ
Translocation of food both in upward and downward directions
93. Ⓑ
Transpiration
94. Ⓒ
Urinary bladder
95. Ⓓ
Bile
96. Ⓐ
Testis
97. Ⓑ
Fallopian tube
98. Ⓒ
Placenta
99. Ⓒ
Cervix
100. Ⓑ
The egg is not fertilised

