



Monthly Progressive Test (Solution)

Class: IX

Subject: PCMB



Test Booklet No.: MPT02

Test Date:

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Physics

1. Ⓓ

$|\text{distance}| \geq |\text{displacement}|$

2. Ⓓ

$$\frac{1}{2} \times 1 \times 20 + 1 \times 20 + 1 \times 10 + \frac{1}{2} \times 1 \times 10 = 10 + 20 + 10 + 5 = 45$$

3. Ⓑ

$$= \frac{x+x}{\frac{x}{v_1} + \frac{x}{v_2}} = \frac{2v_1v_2}{v_1+v_2}$$

4. Ⓓ

$$t = \frac{120}{9+3} = 10 \text{ s}$$

5. Ⓑ

$$t = \frac{u}{a} = \frac{10}{1} = 10 \text{ s}$$

6. Ⓒ

$$x = \frac{1}{2} a \times 100$$

$$x + y = \frac{1}{2} \cdot a \cdot 400 \Rightarrow x + y = 4x \text{ by solving, we get } y = 3x$$

7. Ⓓ

'g' constant.

8. Ⓑ

$$10 = a \times 5 \quad a \Rightarrow 2 \text{ m/s}^2$$

9. Ⓒ

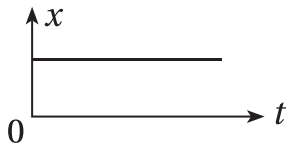
$$V = gt \Rightarrow V = 10 \times 10 = 100 \text{ m/s} \quad [\text{as } u = 0]$$

[1]

10. (B)

 $V = \text{final velocity}$

11. (C)



12. (D)

Displacement is zero.

13. (C)

$$\frac{\text{Distance}}{\text{time}} = \frac{2\pi r}{t}$$

14. (A)

$$\frac{10+11}{2+5} = 3 \text{ m/s}$$

15. (C)

$$36 \text{ km/hr} = 10 \text{ m/s}$$

16. (B)

As pressure \times area = Force

17. (C)

$$[L] - [L] = [L]$$

18. (D)

$$\frac{\Delta L}{L} \equiv \text{Dimensionless}$$

19. (D)

impulse = force \times time

20. (A)

$$\text{L.C} = 0.1 \text{ mm}$$

21. (B)

 $t = 0 \text{ s}$, x has two values

22. (C)

Speed can't be negative

23. ©

as instantaneous rest, $v = 0$

24. Ⓐ

$$\frac{2+4}{2} \times 2 = 6 \text{ m}$$

25. Ⓑ

$$(0)^2 = u^2 - 2as \Rightarrow s = \left(\frac{u^2}{2a} \right)$$

Chemistry

26. ©

Both iron and chalk are solid but the interparticle force of attraction is higher in iron than chalk.

27. ©

Boiling point of water is 100°C . So, in Kelvin scale the temperature is $(100 + 273) = 373 \text{ K}$

28. Ⓐ

The term fluid means the substance which has the ability to flow from one place to the other. So, liquid and gas are the fluids

29. Ⓑ

Boiling point : It is the temperature at which one solid turns into liquid when pressure is one atmosphere

30. Ⓓ

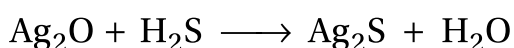
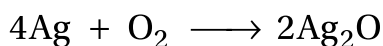
Sublimation : The process in which one solid turns into vapour when heat is supplied.

31. Ⓓ

When solid calcium chloride absorbs water then it becomes soluble in water but the chemical property does not change.

32. Ⓐ

It is a chemical change and related equations are given below



33. ©

On increasing temperature, the rates of evaporation, diffusion, and expansion of gases increase sharply.

34. Ⓑ

Lattice energy : It is the energy needed for the change of state of 1 mole of substance at a constant temperature

35. Ⓓ

Gases do not have definite shape and volume

36. Ⓑ

Gas molecules move randomly inside the container and the perpendicular force applied by them on the inner wall of the container is the measure of pressure

37. Ⓑ

Density of 1 kg sugar is higher than 1 kg cotton. Now, $\text{density} = \frac{\text{mass}}{\text{volume}}$. So, volume of 1 kg cotton is greater than that of 1 kg sugar.

38. Ⓑ

When gas molecules move freely then they obey the linear motion

39. Ⓐ

Evaporation occurs from surface not from bulk

40. Ⓑ

Boiling occurs at a particular temperature and at normal atmospheric pressure

41. ©

Symbol

42. Ⓑ

Argon is an inert gas. Other inert gases are helium, neon, krypton, xenon, radon

43. Ⓐ

Atom

44. Ⓑ

Arsenic

45. Ⓐ

Co

46. (A)

Pascal = Newton / meter²

47. (A)

 $\text{NH}_3 + \text{HCl} \longrightarrow \text{NH}_4\text{Cl}$ it is a chemical change

48. (C)

Solid

49. (B)

Sugar is highly soluble in water hence a solution is formed as no chemical change is going on here.

50. (B)

Material of the container is not a factor of evaporation of a liquid.

Mathematics

51. (B)

$$\begin{aligned}
 & x^2 + \frac{x}{6} - \frac{1}{6} \\
 &= \frac{1}{6}(6x^2 + x - 1) = \frac{1}{6}(6x^2 + 3x - 2x - 1) \\
 &= \frac{1}{6}\{3x(2x+1) - 1(2x+1)\} \\
 &= \frac{1}{6}(2x+1)(3x-1)
 \end{aligned}$$

52. (D)

$$\begin{aligned}
 x - \frac{1}{x} = 2 &\Rightarrow x^2 + \frac{1}{x^2} = 6 \\
 &\Rightarrow x^4 + \frac{1}{x^4} = 34
 \end{aligned}$$

53. (D)

$$\frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab} = \frac{a^3 + b^3 + c^3}{abc} = \frac{3abc}{abc} = 3$$

54. (B)

$$a^{1/3} + b^{1/3} + c^{1/3} = 0$$

$$\therefore (a^{1/3})^3 + (b^{1/3})^3 + (c^{1/3})^3 = 3a^{1/3} b^{1/3} c^{1/3}$$

$$\Rightarrow a + b + c = 3(abc)^{1/3}$$

$$\Rightarrow (a + b + c)^3 = 27abc$$

55. Ⓓ

Any number

56. Ⓓ

Rene Descartes

57. Ⓐ

 $PQ = 5$ units, $SP = 5$ units \therefore Co-ordinates of S is $(-3, 3)$

58. Ⓒ

$$\sqrt{2}x^2 - \sqrt{3}x + 6$$

59. Ⓓ

 $5\sqrt{3}$ is constant polynomial. So, degree = 0

60. Ⓓ

$$p(x) + p(-x) = x + 4 - x + 4 = 8$$

61. Ⓓ

$$a + b + c = 12, a^2 + b^2 + c^2 = 50$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$$

$$\Rightarrow (12)^2 = 50 + 2(ab + bc + ca)$$

$$\Rightarrow 144 - 50 = 2(ab + bc + ca)$$

$$\Rightarrow 94 = 2(ab + bc + ca)$$

$$\Rightarrow ab + bc + ca = 47$$

62. Ⓑ

 $P(-5, 3)$ lies in quadrant II

63. Ⓒ

The origin

64. (A)

Distance of the point A (7, 5) from y-axis = 7 units

65. (C)

Abscissa of A — abscissa of B = 3 - (-2) = 5

66. (C)

$$\sqrt[4]{\sqrt[3]{2^2}} = (4^{1/3})^{1/4} = (4)^{1/12} = 2^{1/6}$$

67. (A)

$$\begin{aligned} & \sqrt[3]{2} \times \sqrt[4]{2} \times \sqrt[12]{32} \\ &= 2^{1/3} \times 2^{1/4} \times (32)^{1/12} = 2^{1/3 + 1/4 + 5/12} = 2^{12/12} = 2 \end{aligned}$$

68. (C)

$$\begin{aligned} & \frac{(x^{2a+2b} \times x^{2b+2c} \times x^{2c+2a})}{x^{4a} \times x^{4b} \times x^{4c}} \\ &= \frac{x^{4a+4b+4c}}{x^{4a+4b+4c}} = 1 \end{aligned}$$

69. (D)

$$\frac{(25)^{5/2} \times (243)^{2/5}}{(16)^{3/4} \times (8)^{5/3}} = \frac{(5)^5 \times (3)^2}{(2)^3 \times (2)^5} = \frac{28125}{256}$$

70. (A)

$$\begin{aligned} a &= \frac{1}{3-2\sqrt{2}} = 3+2\sqrt{2}, b = \frac{1}{3+2\sqrt{2}} = 3-2\sqrt{2} \\ a^2 + b^2 &= (3+2\sqrt{2})^2 + (3-2\sqrt{2})^2 \\ &= 2(9+8) = 34 \end{aligned}$$

71. (C)

$$\begin{aligned} (x^2 + 2x)^2 &= (45)^2 \\ \Rightarrow x^4 + 4x^3 + 4x^2 &= 2025 \\ \Rightarrow x^4 + 4x^3 + 4x^2 - 13 &= 2012 \end{aligned}$$

72. (A)

$$\begin{aligned} p(x) &= x^3 - 5x^2 + 7 \\ p(-2) &= -8 - 20 + 7 = -21 \end{aligned}$$

73. ©

$$a = 2^{1/3} - 2^{-1/3}$$

$$\Rightarrow a^3 = 2 - 2^{-1} - 3 \times 2^{1/3} \times 2^{-1/3} \times (2^{1/3} - 2^{-1/3})$$

$$= 2 - \frac{1}{2} - 3a = \frac{3}{2} - 3a$$

$$\Rightarrow 2a^3 = 3 - 6a \Rightarrow 2a^3 + 6a - 3 = 0$$

74. Ⓓ

A trapezium

75. Ⓑ

A line parallel to the x -axis is given by $y = a$

Biology

76. Ⓐ

Lysosomes

Helps in intracellular digestion.

77. ©

Vacuole

78. Ⓐ

Mitochondria

79. Ⓐ

Membrane biogenesis - ER

RER produces proteins, while SER produces lipids. Both of these are required for forming new membranes.

80. Ⓓ

All of the above

81. Ⓐ

Lipids and steroids

82. Ⓑ

Secretion

83. Ⓑ
Chloroplast
84. Ⓑ
Kolliker
85. Ⓓ
Lysosome
In case of old or worn out cells, the lysosome bursts to release its enzymes, which digests the entire cell.
86. Ⓒ
Chloroplast
Site of photosynthesis.
87. Ⓒ
ATP
88. Ⓒ
Protein synthesis
89. Ⓒ
Ribosome
90. Ⓒ
Ribosome
91. Ⓐ
Nucleus
Regulates all the activities of a cell.
92. Ⓓ
Selectively permeable
It allows only certain substances to enter or exit a cell.
93. Ⓒ
Centrosome
It is a distinct organelle.
94. Ⓒ
Bacterial cell



Its a prokaryotic cell.

95. ©

Endosmosis

Water being hypotonic, enters the cell through the process of osmosis.

96. ©

Leucoplast

Its function is to store food, hence does not require pigments.

97. Ⓐ

Ribosome

98. Ⓓ

A single big vacuole occupies almost the entire inner space of the cell

99. ©

Lysosome

100. Ⓐ

Endoplasmic reticulum

