



Monthly Progressive Test

Class: IX

Subject: PCMB

Test Booklet No.: MPT01

Test Date:

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Time: 180 mins

Full Marks: 200

Solutions

Physics

1. (B)

$$1 \text{ N} \cdot \text{m} = 10^5 (\text{dyne})(100 \text{ cm}) = 10^7 \text{ dyne} \cdot \text{cm}$$

2. (C)

Newton

3. (A)

$$8 \times 60 + 20 = 500 \text{ s}$$

4. (C)

$$\text{kg} \cdot \text{m} (\text{m/s}^2) = \text{kg} (\text{m/s}^2) \cdot \text{m} = \text{joule}$$

5. (A)

P is directly proportional to v and P is directly proportional to F , therefore P is directly proportional to $(F \cdot v)$.

6. (C)

$$\left(\frac{\text{ML}}{\text{T}^2}\right)\left(\frac{\text{L}}{\text{M}}\right) = \left(\frac{\text{L}}{\text{T}}\right)^2 \Rightarrow (\text{velocity})^2$$

7. (D)

$$\text{Least count} = \frac{2}{40} \text{ mm} = 0.05 \text{ mm}$$

8. (D)

Giga ohm

9. ©

$$\text{L.C} = \frac{1}{10} \text{ mm} = 0.1 \text{ mm}$$

10. Ⓐ

SI unit of acceleration is m/s^2

11. ©

$$P = mv \Rightarrow (\text{kg})(\text{m/s}) = \text{kg m/s}$$

12. Ⓑ

$$\text{Impulse} = mv - mu$$

13. ©

$$1 \text{ litre} = 1000 \text{ cc and } 1 \text{ m}^3 = 10^6 \text{ cc}$$

14. Ⓓ

Mole

15. Ⓓ

radian

16. Ⓑ

$$\text{as } F = ma; \Rightarrow \text{kgm/s}^2$$

17. Ⓓ

$$F \cdot t \Rightarrow N \cdot s \text{ and } mv - mu \text{ gives kgm/s}$$

18. Ⓐ

1 mm

19. Ⓐ

0.1 mm

20. Ⓐ

$$20 \text{ MSD} \times 0.5 \text{ mm} = 10 \text{ mm}$$

21. Ⓐ

$$\left(\frac{\text{MLT}^2}{\text{T}^2} \right) = \text{ML}$$

[3]

22. Ⓑ

$$L^3$$

23. Ⓑ

as Force = Pressure \times area

24. Ⓒ

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

25. Ⓓ

as numerator and denominator have same dimensions.

Chemistry

26. Ⓒ

H₁ : Electronic configuration of H = K₁

He₂ : Electronic configuration of He = K₂

So, number of electrons present in K shells of hydrogen and helium are 1 & 2 respectively.

27. Ⓑ

Charge possessed by permanganate ion (MnO₄⁻¹) = -1

Charge possessed by bisulphite ion (HSO₃⁻¹) = -1

28. Ⓑ

Formula of chlorides of X = XCl₃;

Formula of chlorides of Y = YCl₄

So, valency of X & Y are respectively 3 & 4

29. Ⓒ

'A' = Metal; 'A' has valency = 2

'B' = Non-metal; 'B' has valency = 1

So, Formula AB₂

30. Ⓑ

Neon is inert gas. It does not react due to stable electronic configuration (octet).

Electronic configuration of Ne₁₀ = K₂L₈.

31. Ⓓ

Formula of metal chloride = MCl_2

So, the valency of metal = 2

as valency is interchange.

32. Ⓑ

Helium, He_2 : E.C. = K_2

Neon, Ne_{10} : E.C. = K_2L_8

Argon, Ar_{18} : E.C. = $K_2L_8M_8$

Xenon, Xe_{54} : E.C. = $K_2L_8M_{18}N_{18}O_8$

33. Ⓐ

Silicate = SiO_3^{2-}

Ammonium = NH_4^{1+}

Ferrous = Fe^{2+}

Chromium = Cr^{3+} or Cr^{6+}

34. Ⓑ

Formula of non-metallic oxide = X_2O_5 . So valency of 'X' = 5

Now, formula of chloride of 'X' = XCl_5 [\because valency of Cl = 1]

35. Ⓒ

Formula of metal Nitrite = $M(NO_2)_2$

So, valency of metal = 2

Now, the formula of metal dihydrogenphosphate = $M(H_2PO_4)_2$

Since valency of Dihydrogenphosphate (H_2PO_4) = 1

36. Ⓓ

Atomic Number = 20

Mass Number = 40

So, Number of neutron (N) = Mass no. - Atomic no.

$$= 40 - 20 = 20$$

Atomic Number = 13

Mass Number = 27

No. of neutron (N) = Mass no. - Atomic no.

$$= 27 - 13 = 14$$

37. ©

Non-metal = X

X gain 3 electrons to complete Octet

So, the valency of X = 3

∴ Formula of Hydride of X = XH_3

as valency of H = 1

38. ©

Since atom is neutral, total number of +ve charge = total number of -ve charge
= total number of electrons

 $A_{10} = 2,8$ $B_{18} = 2,8,8$ $C_8 = 2,6$

A and B have octet. C has 6 electrons in valence shell.

39. Ⓑ

Uninegative (-1) ion

Neutron (N) = 10

Proton (p) = 9

∴ Electron = $9 + 1 = 10$

E.C. = of the atom = 2,7

40. Ⓐ

Carbonate (CO_3^{2-}); Nitrate (NO_3^{-}); Chloride (Cl^{-}); Phosphate (PO_4^{3-})

41. Ⓓ

Carbondioxide (CO_2); Water (H_2O);Air is a mixture of O_2 , N_2 etc.Nitrogen (N_2)

42. ©

The short form of an element is known as symbol.

43. Ⓓ

There are altogether 118 element.

44. Ⓑ

Argon (Ar) is an inert gas.

45. Ⓑ

Bromine is the only non-metallic liquid.

46. (A)

Smallest particle of the element which may or may not exist independently but take part in the chemical reaction is known as atom.

47. (B)

Arsenic (As) is a metalloid, carbon (C) is non-metal.

Iron (Fe) is metal.

Sodium (Na) is metal.

48. (A)

The symbol of cobalt is Co

49. (C)

The chemical formula of potassium permanganate is KMnO_4 .

50. (D)

${}^{39}\text{K}_{19}$.

Mass number = Total no. of Proton (p) + total no. of Neutron (N) = 39

Atomic number = Total no. of Proton (p) = 19

\therefore Total no. of Neutrons (N) = 39 - 19 = 20

Mathematics

51. (A)

The sum of a rational number and an irrational number is irrational.

52. (C)

$$\sqrt{13 - x\sqrt{10}} = \sqrt{8} + \sqrt{5} \Rightarrow 13 - x\sqrt{10} = 8 + 5 + 4\sqrt{10} = 13 + 4\sqrt{10} \Rightarrow x = -4$$

53. (B)

$$2^{2008} - 2^{2007} - 2^{2006} + 2^{2005} = k \times 2^{2005} \Rightarrow 2^{2005}(8 - 4 - 2 + 1) = k \times 2^{2005} \Rightarrow 3 = k$$

54. (C)

$$\left(\frac{X^b}{X^c}\right)^{\frac{1}{bc}} \times \left(\frac{X^c}{X^a}\right)^{\frac{1}{ca}} \times \left(\frac{X^a}{X^b}\right)^{\frac{1}{ab}} = (x)^{\frac{b-c}{bc}} \times (x)^{\frac{c-a}{ca}} \times (x)^{\frac{a-b}{ab}} = x^0 = 1$$

55. (A)

$$\sqrt[4]{16} = 2$$

56. (A)

$$3 \cdot \bar{6} = \frac{11}{3}$$

57. (C)

$$\frac{100\sqrt{25}}{\sqrt{25+x}} = 50 \Rightarrow \frac{500}{5+x} = 50 \Rightarrow 5+x=10 \Rightarrow x=5 = \sqrt{25}$$

58. (D)

Every rational number is real number.

59. (C)

$$2 < \sqrt{5} < 2.5$$

60. (A)

$$(256)^{0.16} \times (256)^{0.09} = (256)^{\frac{1}{4}} = 4$$

61. (A)

$$2.2323\dots = \frac{221}{99}$$

62. (D)

$$3\sqrt{6} + 4\sqrt{6} = 7\sqrt{6}$$

63. (A)

$$\sqrt[3]{216} - \sqrt[3]{125} = 6 - 5 = 1$$

64. (B)

$$x = \frac{\sqrt{7}}{5} \text{ and } \frac{5}{x} = p\sqrt{7} \Rightarrow p = \frac{25}{7}$$

65. (A)

Co-prime numbers are 2,3

66. (D)

$$X^{\frac{1}{12}} = 49^{\frac{1}{24}} \Rightarrow x = 7$$

67. (A)

$$X^2 + \frac{1}{X^2} = 5$$



68. (A)

$$\frac{1}{\sqrt{4}-\sqrt{3}} = 2 + \sqrt{3}$$

69. (D)

$$12 - 2\sqrt{35}$$

70. (A)

$$x = 3 + 2\sqrt{2}, y = 3 - 2\sqrt{2} \quad \therefore x^2 + y^2 = 34$$

71. (A)

$$3 < \sqrt{11} < 4$$

72. (A)

$$x = 2 + \sqrt{3}, y = 2 - \sqrt{3} \quad \therefore x + y = 4$$

73. (B)

$$4^{2x-1} = 32 \Rightarrow 2^{4x-2} = 2^5 \Rightarrow 4x = 7 \Rightarrow x = \frac{7}{4}$$

74. (A)

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

75. (A)

$$\sqrt{x} + \frac{1}{\sqrt{x}} = 2 \Rightarrow x + \frac{1}{x} = 2 \Rightarrow (x-1)^2 = 0 \Rightarrow x = 1 \quad \therefore x^8 + \frac{1}{x^8} = 2$$

Biology

76. (B)

Cell membrane is the outer covering of animal cells.

77. (D)

78. (B)

79. (A)

Nucleus controls all the functions of a cell.

80. (A)

Prokaryotic cells contain naked chromatin.

81. Ⓑ

82. Ⓐ

83. Ⓐ

84. Ⓓ

It regulates the entry and exit of different substances across itself.

85. Ⓑ

86. Ⓒ

87. Ⓒ

88. Ⓑ

89. Ⓐ

Like the brain to the body, the nucleus monitors and regulates all the activities of a cell.

90. Ⓒ

Centrosome is an organelle found in animal cells and is not a part of nucleus.

91. Ⓒ

Bacterial cell is a prokaryotic cell with a primitive nucleus or nucleoid.

92. Ⓐ

The chromatin network present in the nucleus contain genes.

93. Ⓒ

The cell wall is hard and rigid, maintaining the shape of the cell and providing support.

94. Ⓒ

Water, being hypotonic with respect to the solution inside the raisin, enters into it by endosmosis.

95. Ⓐ

96. Ⓓ

97. Ⓑ

The function is owing to the selective permeability of the cell membrane.

98. Ⓒ

99. Ⓒ

100. Ⓒ

15 cm in length and 13 cm in width.