



Monthly Progressive Test (Solution)

Class: IX

Subject: PCMB



Test Booklet No.: MPT09

Test Date:

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Physics

1. ©

$$\frac{30+90}{1+\frac{90}{u}} = 60 \rightarrow 2 = 1 + \frac{90}{u} \quad u = 90 \text{ km/hr}$$

2. Ⓐ

$$\frac{9 \times \frac{1}{6} + u \times \frac{1}{3}}{\frac{1}{2}} = 12 \Rightarrow \frac{3}{2} + \frac{u}{3} = 6 \Rightarrow 9 + 2u = 36 \Rightarrow u = 13.5 \text{ km/h}$$

3. Ⓑ

$$v_{avg} = \frac{20}{1} = 20 \text{ cm/min}$$

4. ©

$$\frac{45-40}{\frac{2}{60}} = \frac{5 \times 60}{2} = 150 \text{ km/h}^2$$

5. Ⓓ

$$\frac{15+75}{2} \times \frac{4}{60} = \frac{90}{30} = 3 \text{ km}$$

6. Ⓐ

It is balanced

7. Ⓑ

It is called normal force

8. ©

True. Spring pulls the attached string

9. Ⓑ

Earth pulls objects towards its centre

10. Ⓐ

Table exerts a force of friction on the ball

11. ©

As per Newton's third law

12. Ⓓ
It is the interactive attractive force between Earth and stone.
13. Ⓒ
We require sharp edge of knife.
14. Ⓑ
With depth of water, pressure increases
15. Ⓓ
Density of water at 4°C is 1 g/c.c or 1000 kg/m³
16. Ⓑ
Weight and upthrust
17. Ⓐ
As $F = G \cdot \frac{m_1 \cdot m_2}{r^2}$
18. Ⓒ
Centripetal acceleration is $\left(\frac{v^2}{r}\right)$
19. Ⓒ
As per Kepler's law of period
 $T^2 \propto r^3$
20. Ⓑ
Use the relation $GM = gR^2$
21. Ⓐ
 $mgh = (1)(9.8) \frac{50}{100} \sin 30^\circ = 2.45 \text{ J}$
22. Ⓑ
 $v^2 = 2gH \Rightarrow 40 \times 40 = 19.6H \Rightarrow H = 81.6 \text{ m}$
23. Ⓓ
Assertion is wrong statement and Reason part statement is correct.
24. Ⓐ
Ultrasonic wave
25. Ⓒ
The intensity falls in the cracked zone.

Chemistry

26. Ⓒ
90% ; 10%
Average atomic mass of element x = 16.2 u.
Let the % of ¹⁶Mg = x
∴ % y ¹⁸Mg = (100 - x)

[3]

$$16.2 = \frac{16 \times (x) + 18(100 - x)}{100}$$

$$\Rightarrow x = 90\%$$

$$\therefore \% \text{ of } ^{16}\text{Mg} = 90\%$$

$$\therefore \% \text{ of } ^{15}\text{Mg} = 100 - 90 = 10\%$$

27. Ⓓ

Kerosene & water is a heterogeneous mixture.

28. Ⓓ

DHOKLA is a solution of Gas in solid.

29. Ⓓ

Shaving cream is not an example of Aerosol. Colloids are classified on the basis of the physical state of the dispersion medium and dispersed phase. In fog, clouds and mist dispersed phase is liquid and dispersion medium is gas.

30. Ⓐ

Cheese is an example of Gel.

31. Ⓒ

Tyndall effect in colloids is due to scattering of light.

32. Ⓑ

$$-80^\circ\text{C} = 273 - 80\text{K} = 193\text{K}.$$

33. Ⓒ

Remain the same.

34. Ⓒ

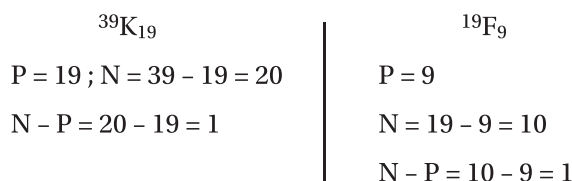
$$1 \text{ molecule} \equiv 5.32 \times 10^{-23} \text{ g}$$

$$6.022 \times 10^{23} \text{ molecule} \equiv 5.32 \times 10^{-23} \times 6.022 \times 10^{23} \text{ g}.$$

$$\equiv 32.04 \approx 32 \text{ g}.$$

35. Ⓓ

Isodiaphers : The atoms of different elements that show same isotopic number i.e. same (n-p) value is called isodiaphers.



36. Ⓒ

Assertion is true but reason is false. Milk is an example of emulsion. Thus the answer is C.

37. Ⓐ

Both assertion and reason are correct. Reason is the correct explanation of Assertion. Thus the answer is 'A'.

38. (A)

$$\text{G. M.W. of } K_2CO_3 = 78 + 12 + 3 \times 16 = 138 \text{ g}$$

Gram. At wt of C = 12 g.

1g - atom of carbon contain 6.022×10^{23} carbonation.

Here both assertion & reason are correct and reason is the correct explanation of Assertion. Thus the answer is 'A'.

39. (C)

Assertion is correct but reason is wrong. Thus, the answer is 'C'.

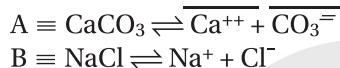
40. (A)

$$197 \text{ g Au} \equiv 6.022 \times 10^{23} \text{ atoms of Au}$$

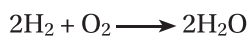
$$19.7 \text{ g Au} \equiv \frac{6.022 \times 10^{23} \times 19.7}{197} \text{ atom y Au}$$

$$\equiv 6.022 \times 10^{22} \text{ atom of Au.}$$

41. (D)



42. (D)



$$2 \times 2 \quad 2 \times 16 \quad 2 \times 18$$

$$= 4g \quad = 32g \quad = 36g$$

$$4g \text{ H}_2 \equiv 32g \text{ O}_2$$

$$15g \text{ H}_2 \equiv \frac{8 \times 32 \times 15}{4} g \text{ O}_2$$

$$\equiv 120g \text{ O}_2$$

43. (D)

The elements having different atomic number but same mass number are called isobars. ex : $^{40}\text{Ar}_{18}$ & $^{40}\text{Ca}_{20}$

44. (A)

No. of electrons = No. of proton (P) = 15

No. of Neutron (N) = 16

Mass no = P + N = 15 + 16 = 31

So, correct representation = $^{31}\text{X}_{15}$

45. (D)

Maximum number of electrons = $2n^2$

$$\text{N - shell} \Rightarrow n = 4 \quad = 2(4)^2$$

$$= 32$$

46. (B)

K < L < M < N — Increase Energy

47. (C)

E. C = K₂ L₈ M₃

∴ Total electron = 13 = total proton.

∴ Atomic number = 13.

Then the element is $^{27}\text{Al}_{13}$

48. ©

$^{27}\text{Al}_{13}$ No. of electrons in M^{3+} ion = 10
 No. of electron in the neutral atom = $10 + 3 = 13$
 Atomic number = No. of proton = No. of electron = 13
 Mass no = Proton + Neutron
 = $13 + 14 = 27 = 27$
 Then the element is $^{27}\text{Al}_{13}$

49. ©

$\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy}$
 1 molecule of glucose $\text{C}_6\text{H}_{12}\text{O}_6 = 180$ g. of glucose requires 6 oxygen molecules to burn and release energy.
 \therefore 180 g of glucose requires = 6O_2 or 12 'O' atom.
 = $12 \times 16 = 192$ g of 'O'
 \therefore 40 g of glucose requires = $\frac{192}{180} \times 40$ g of 'O' per hr.
 = 42.66 g of 'O' per hr.
 \therefore For 24×30 oxygen (30 days) requires = $42.66 \times 720 = 30722.4$ g = 30.7 kg.

50. ©

1.9×10^{10} yrs.
 1 Avogadro number rupees = 6.022×10^{23} rupees.
 Time required to spend 10 lac rupees = 1 sec.
 \therefore Time required to spend 1 Avogadro number of rupees = $\frac{1}{10^6} \times 6.022 \times 10^{23}$ sec.
 = $\frac{6.022 \times 10^{23}}{10^6 \times 60 \times 60 \times 24 \times 365}$
 = 1.909×10^{10} yrs.

Mathematics

51. ©

$$\begin{array}{l}
 h_1 = 4.1 \text{ cm} \\
 h_2 = 4.3 \text{ cm} \\
 \frac{1}{3}\pi r_1^2 h_1 + \frac{1}{3}\pi r_2^2 h_2 = \frac{4}{3}\pi r^3
 \end{array}
 \left.
 \begin{array}{l}
 r_1 = 2.1 \text{ cm} \\
 r_2 = 2.1 \text{ cm}
 \end{array}
 \right\}
 \begin{array}{l}
 \text{ATQ. } \frac{1}{3}\pi r_1^2 h_1 + \frac{1}{3}\pi r_2^2 h_2 = \frac{4}{3}\pi r^3 \\
 \Rightarrow \frac{1}{3}\pi (r_1^2 h_1 + r_2^2 h_2) = \frac{4}{3}\pi r^3 \\
 \Rightarrow (2.1)^2 [4.1 + 4.3] = 4r^3 \\
 \Rightarrow 2.1 \times 2.1 \times 8.4 = 4r^3 \\
 \Rightarrow 2.1 \times 2.1 \times 2.1 = r^3 \\
 \therefore R = 2.1 \Rightarrow D = 4.2
 \end{array}$$

52. ©

$$\left.
 \begin{array}{l}
 \angle BDE = \angle A = 54^\circ \\
 \angle BFD = 180^\circ - x
 \end{array}
 \right\}
 \begin{array}{l}
 35^\circ + 54^\circ + 180^\circ - x = 180^\circ \Rightarrow x = 89^\circ \\
 \text{Again, } x + y + 54^\circ = 180 \Rightarrow 89 + y + 54 = 180 \Rightarrow y = 37^\circ
 \end{array}$$

53. ©

$$c = 75^\circ, a = \frac{2}{5} \times 75^\circ = 30^\circ$$

$$a + b = c = 75^\circ$$

$$30^\circ + b = 75^\circ \Rightarrow b = 45^\circ \Rightarrow d = 135^\circ$$

$$b + \frac{d}{2} = 45^\circ + \frac{135^\circ}{2} = 112.5^\circ$$

54. Ⓓ

$$x + y < 180^\circ \Rightarrow l \text{ and } m$$

Intersect on the side of x and y

55. Ⓐ

$$\text{First axiom : } a = b; c = b \Rightarrow a = c$$

56. Ⓐ

465

57. Ⓑ

Boundary of surface \rightarrow curve

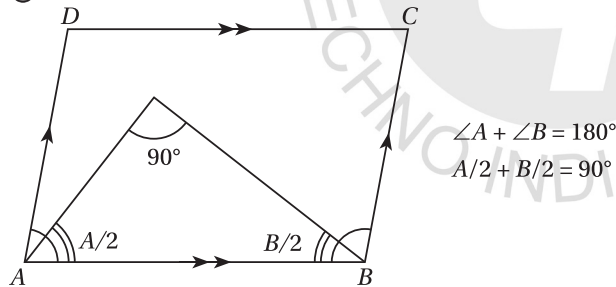
58. Ⓑ

$$120^\circ + 98^\circ + 92^\circ + x^\circ = 360^\circ \Rightarrow x = 50^\circ$$

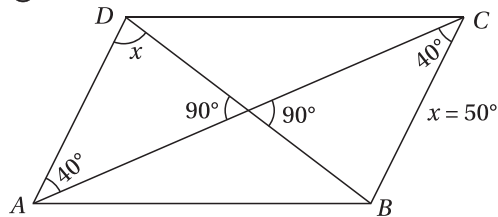
59. Ⓓ

Square

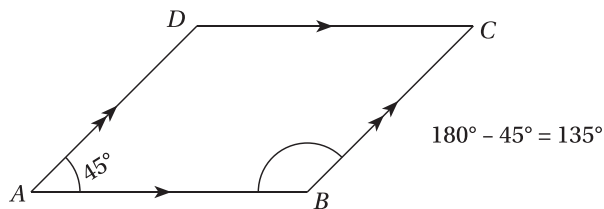
60. Ⓓ



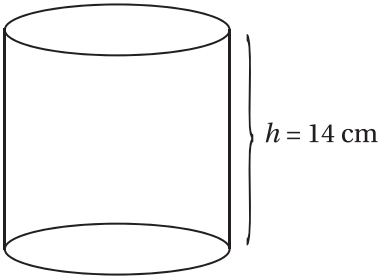
61. ©



62. Ⓓ



63. ②



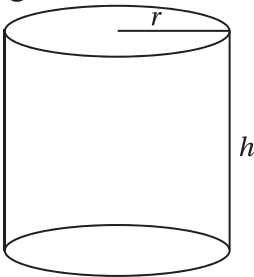
$$2\pi rh = 88 \Rightarrow 2 \times \frac{22}{7} \times r \times 14 = 88 \Rightarrow r = 1 \Rightarrow D = 2$$

64. ④

$$D_m = \frac{1}{4} D_E \Rightarrow r_m = \frac{1}{4} r_E$$

$$\Rightarrow 4\pi r_m^2 : 4\pi r_E^2 = \left(\frac{1}{4} r_E\right)^2 : r_E^2 = \frac{1}{16} r_E^2 : r_E^2 = 1 : 16$$

65. ②



$$h \rightarrow 2h$$

$$r \rightarrow 2r$$

$$LSA = 2\pi rh$$

$$\text{New LSA} = 2\pi(2r)(2h)$$

$$\text{NEW LSA} = 8\pi rh = 4 \cdot \text{LSA}$$

$$k = 4$$

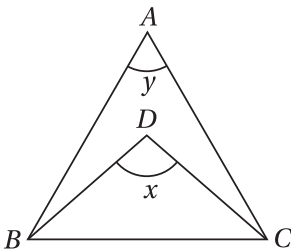
66. ③

$$BG = 6 \Rightarrow GE = 3 \Rightarrow BE = 9$$

67. ④

$$\frac{\frac{1}{2} \times BD \times AD}{\frac{1}{2} \times DC \times AD} = \frac{BD}{DC} = \frac{m}{n} = m : n$$

68. ①



$$x = 90^\circ + y/2 \Rightarrow 2x = 180^\circ + y \Rightarrow 2x - y = 180^\circ$$

69. Ⓑ

$$r = 20 \text{ cm}$$

$$\text{rate} = 25 \text{ cm/s}$$

$$\text{volume of water} = \pi \times (20)^2 \times 25 \times 60 \text{ cm}^3 = 3.14 \times 20 \times 20 \times 25 \times 60 \text{ cm}^3 = \frac{3.14 \times 20 \times 20 \times 25 \times 60}{1000} \text{ l} = 1,884 \text{ l}$$

70. Ⓐ

Orthocentre

71. Ⓐ

A → True

R → True and correct explanation ⇒ option Ⓐ

72. Ⓑ

A → True

R → True but not the correct explanation ⇒ option Ⓑ

73. Ⓐ

$$A = 3B; C = 2B \quad \Rightarrow A + B + C = 180^\circ \quad \Rightarrow 3B + B + 2B = 180^\circ \quad \Rightarrow B = 30^\circ$$

74. Ⓒ

$$C = 2 \times 30^\circ = 60^\circ$$

75. Ⓓ

$$A = 3 \times 30^\circ = 90^\circ$$

Biology

76. Ⓒ

Mixed farming.

77. Ⓐ

Boron.

Required in very small amounts.

78. Ⓒ

Sahiwal.

Native breed.

79. Ⓓ

All of the above.

80. Ⓓ

Chromosome.

81. Ⓑ

Endocytosis.

82. Ⓓ

Endoplasmic reticulum.

83. Ⓓ
Tracheids
84. Ⓐ
Sclerenchyma.
85. Ⓓ
Involuntary, faintly striated and uninucleate.
86. Ⓐ
Ligament.
87. Ⓒ
A is true but R is false.
88. Ⓒ
A is true but R is false.
Meiosis occurs during the formation of gametes
89. Ⓑ
Both A and R are true and R is the correct explanation of A.
90. Ⓐ
Both A and R are true and R is the correct explanation of A.
91. Ⓒ
A is true but R is false.
92. Ⓓ
A is false but R is true.
When a cell is placed in a hypertonic solution, it shrinks due to exosmosis.
93. Ⓐ
Brain of cell.
94. Ⓒ
Blue green algae.
95. Ⓐ
Sieve tubes.
To enable the smooth passage of food through them.
96. Ⓐ
Nucleolus is covered by a single membrane.
Nucleolus is membrane-less.
97. Ⓒ
Sclerenchyma, Collenchyma, Sclerenchyma.
98. Ⓒ
Tissue C.
99. Ⓑ
Tissue B.
100. Ⓓ
None.
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