



Monthly Progressive Test

Class: IX

Subject: PCMB (G)

Test Booklet No.: MPT05

Test Date:

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Time: 180 mins

Full Marks: 200

Solutions

Physics

1. Ⓐ

$$u = 10 \text{ ms}^{-1}$$

$$v = 0$$

$$s = 4\text{m}$$

$$v^2 = u^2 - 2as$$

$$m = 1000 \text{ kg}$$

$$\Rightarrow a = \frac{u^2}{2s}$$

$$\therefore F = \frac{mu^2}{2S} = \frac{1000 \times 10 \times 10}{2 \times 4}$$

$$\Rightarrow F = 125000\text{n} = 12.5 \text{ kN}$$

2. Ⓓ

$$m = 1\text{kg}$$

$$a = \frac{9-9}{3-0} = 3\text{ms}^{-2}$$

$$F = ma = 1 \times 3 = 3\text{N}$$

3. Ⓓ

$$F = 0$$

$$ma = 0$$

$$m \neq 0; a = 0$$

So body may be at rest or moving with uniform velocity.

4. (B)

5. (D)

As per Newton's 3rd Law

6. (C)

Horizontal component of reaction from ground

7. (A)

The object must be at rest condition is not the only criterion because object can be in uniform motion/constant velocity

8. (C)

As per Newton's 3rd law

9. (A)

As $P = mv$ and inertia is measured by mass

10. (B)

As $F_{\text{net}} = ma$ and $a = 0$

11. (C)

$$x \text{ dyne} = 0.1 \text{ N}$$

$$\Rightarrow x \times 10^{-5} \text{ N} = 0.1 \text{ N}$$

$$\Rightarrow x = \frac{0.1}{10^{-5}} = 10^4$$

12. (A)

13. (A)

14. (A)

$$F = ma$$

$$(i) 2\text{kg} \times 5 \text{ ms}^{-2} = 10 \text{ N} = F$$

$$(ii) 4\text{kg} \times 5 \text{ ms}^{-2} = 20 \text{ N} = 2F$$

$$a = \text{constant} \Rightarrow F \propto m$$

15. (C)

16. (D)

[3]

$$I = F \cdot t = ma \cdot t = m(v - u)$$

17. (A)

18. (B)

19. (C)

Apply $v = u - gt$ or $v^2 = u^2 - 2gh$

20. (C)

$$u = 40 \text{ ms}^{-1}$$

$$v = 10 \text{ ms}^{-1}$$

$$t = 6 \text{ s}$$

$$v = u + at$$

$$\therefore 10 = 40 + a \cdot 6$$

$$\Rightarrow 6a = -30$$

$$\Rightarrow a = -5 \text{ ms}^{-2}$$

21. (C)

Upthrust and weight

22. (B)

When weight > upthrust

23. (C)

Density of solid < density of water

24. (A)

Restore force

25. (B)

$$F_{\text{net}} > 0$$

Chemistry

26. (A)

Valency of sodium = 1 and charge on sulphate radical = 2

So, Molecular formula of sodium sulphate is Na_2SO_4

27. (C)

Molecular formula $\text{C}_6\text{H}_{12}\text{O}_6$

So, molecular mass = $[(12 \times 6) + (12 \times 1) + (16 \times 6)] = 180$

28. Ⓑ

When two different atoms combine with each other then a heteroatomic molecule is formed

29. Ⓐ

The molecular formula of oxygen molecule is O_2 . Hence the molecular mass
 $= (16 \times 2) = 32$ amu

30. Ⓑ

Iron is strongly attracted by magnet but sand is a non-magnetic substance. Sulphur, chalk powder, common salt are also non-magnetic substances.

31. Ⓐ

True solution is homogeneous i.e. all components mix with each other properly in a particular ratio and stability of a solution depends on the nature of the components.

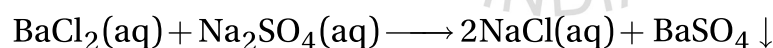
32. Ⓑ

Molecular formula of alum is $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$

It is a double salt as chemical properties of the ions K^+ , Al^{3+} and SO_4^{2-} remain same after the formation of the molecule

33. Ⓒ

The correct equation is given below



34. Ⓓ

(white)

When camphor is kept in open space, then its mass decreases due to sublimation.

35. Ⓓ

Fractional distillation is used to separate the components of solution which are miscible and the difference between their boiling point value $25^\circ C$.

36. Ⓐ

Atoms are the basic constituent particles of solid, liquid and gaseous substances. Atoms cannot be created or destroyed and the relative number and kind of atoms are not constant for a given compound.

37. Ⓒ

When pressure is increased, then volume decreases and thus more number of gas

molecules comes more close to the surface of the liquid. Thus solubility of the gas increases at a constant temperature.

38. Ⓑ

To prepare tincture of iodine, small amount of iodine is added to ethyl alcohol. So, iodine is the solute and ethyl alcohol is the solvent.

39. Ⓑ

When more than one letters are used to represent an element then the first letter must be upper case and others are in lower case

40. Ⓑ

Ions are formed due to transfer of electron(s). If the atom receives electron(s) then it forms anion and when it releases electron(s) then cation is formed

41. Ⓓ

Tyndall effect is shown by the colloidal solutions like smoke, foam, jelly while true solution like sugar solution does not show this property

42. Ⓒ

For the conversion of 1 gm ice into water at 0°C , 80 cal heat is needed

So, for 12 gm, the amount of heat needed is $(12 \times 80) = 960$ cal

43. Ⓒ

Sand, camphor and common salt are non-magnetic substances hence magnetic method of separation is not needed here. All components are solid at room temperature hence distillation method cannot be applicable in this case. At first sublimation separates camphor then the mixture is dissolved in water and common salt is dissolved in it. Filtration now separates sand and after that evaporation generates pure common salt in solid form.

44. Ⓑ

Valency of chlorine = 1

So, valency of element 'X' = 3 and valency of element 'Y' = 4

45. Ⓒ

Rate of evaporation increases with temperature and rate of diffusion too. When temperature increases, volume of the gas increases thus the gas expands

46. Ⓐ

Formula of the ions are given below

Bisulphate HSO_4^- , Sulphite SO_3^{2-} , Hydride H^- , Nitrite NO_2^-

47. (B)

Formula of sulphate radical is SO_4^{2-} , sulphite radical SO_3^{2-} . Both have same elements and total charge is same for both radicals but the number of oxygen atoms is different

48. (C)

Sulphate radical (SO_4^{2-}) S : O = 1 : 4

Nitrite (NO_2^-) N : O = 1 : 2

Carbonate (CO_3^{2-}) C : O = 1 : 3

Phosphate (PO_4^{3-}) P : O = 1 : 4

Nitrate (NO_3^-) N : O = 1 : 3

49. (A)

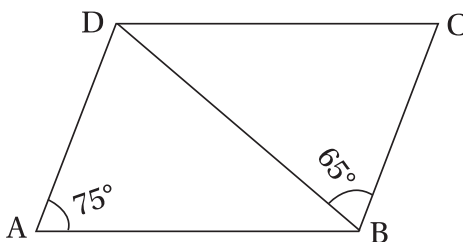
Atoms combine with each other in simple whole number ratio to form molecules. Hence representation by a fraction is not a proper method

50. (D)

Chalk powder is insoluble in water and hence it settles down as it is heavier component in the system

Mathematics

51. (A)



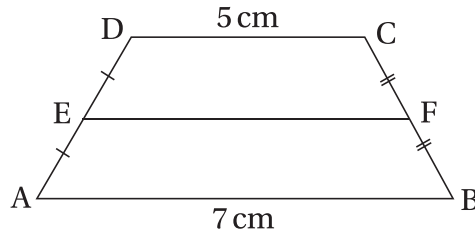
$$\angle A = \angle C = 75^\circ$$

$$\angle DBC = 65^\circ \therefore \angle BDC = 180^\circ - (75^\circ + 65^\circ)$$

$$= 180^\circ - 140^\circ = 40^\circ$$

52. (C)

[7]



$$EF = \frac{1}{2}(AB + DC) = \frac{1}{2}(7 + 5) \text{ cm}$$

$$= 6 \text{ cm.}$$

53. Ⓑ

$$AO = 12 \text{ cm}$$

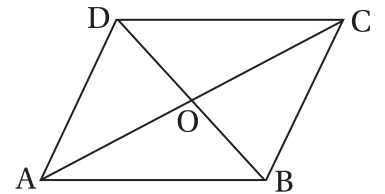
$$BO = 9 \text{ cm}$$

$$\therefore AB = \sqrt{9^2 + 12^2} \text{ cm}$$

$$= \sqrt{81 + 144} \text{ cm}$$

$$= \sqrt{225} \text{ cm}$$

$$= 15 \text{ cm}$$



54. Ⓐ

$$OA = OP = 5 \text{ cm}$$

$$OM = 4 \text{ cm}$$

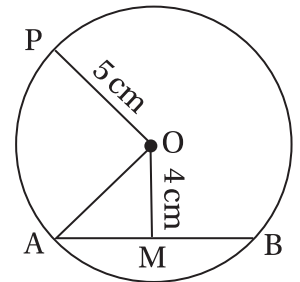
$$\therefore AM = \sqrt{(5)^2 - (4)^2} \text{ cm}$$

$$= \sqrt{25 - 16} \text{ cm}$$

$$= \sqrt{9} \text{ cm}$$

$$= 3 \text{ cm}$$

$$\therefore AB = 6 \text{ cm}$$



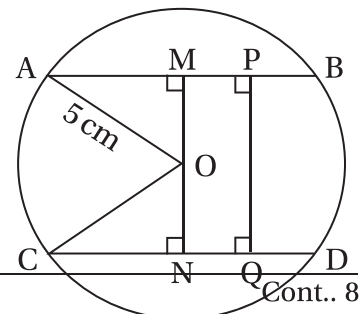
55. Ⓒ

$$AB = 6 \text{ cm}$$

$$CD = 8 \text{ cm}$$

$$OA = 5 \text{ cm}$$

$$AM = 3 \text{ cm}$$



$$OM = \sqrt{25-9} \text{ cm}$$

$$= \sqrt{16} \text{ cm} = 4 \text{ cm}$$

$$CN = 4 \text{ cm}$$

$$ON = \sqrt{25-16} \text{ cm}$$

$$= \sqrt{9} \text{ cm}$$

$$= 3 \text{ cm}$$

$$\therefore MN = (4 + 3) \text{ cm} = 7 \text{ cm}$$

56. Ⓐ

$$\triangle ABC \cong \triangle ADC$$

$$\Rightarrow \angle ACB = \angle ACD \quad (\text{c.p.c.t})$$

$$\angle BAC = 30^\circ, \angle ABC = 100^\circ$$

$$\therefore \angle ACB = 180^\circ - (100^\circ + 30^\circ)$$

$$= 180^\circ - 130^\circ = 50^\circ$$

$$\therefore \angle ACD = 50^\circ$$

57. Ⓑ

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\frac{\angle A}{4} + \frac{\angle B}{4} + \frac{\angle C}{5} = 41^\circ$$

$$\Rightarrow 5\angle A + 5\angle B + 4\angle C = 820^\circ \quad \dots (1)$$

$$\text{Again, } 4\angle A + 4\angle B + 4\angle C = 720^\circ \quad \dots (2)$$

$$\text{From (1) - (2) } \angle A + \angle B = 100^\circ$$

58. Ⓐ

(A): The sum of the angles of a quadrilateral is 360° which is true

(R): A quadrilateral can be divided by one diagonal into two triangles and the sum of the angles of a triangle is 180° .

(R) is true and it is the correct explanation of (A).

59. Ⓑ

(A): The diagonals of a rhombus bisect each other at right angle which is true.

(R): A rhombus is a quadrilateral with all sides equal which is true. But (R) is not the correct explanation of (A).

60. Ⓓ

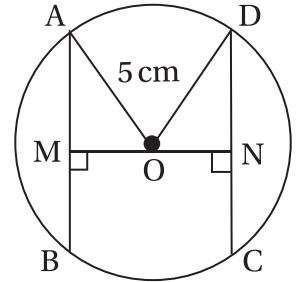
$$OA = 5 \text{ cm}$$

$$OM = 3 \text{ cm}$$

$$ON = 4 \text{ cm}$$

$$\begin{aligned} \therefore AM &= \sqrt{25 - 9} \text{ cm} \\ &= 4 \text{ cm} \end{aligned}$$

$$\therefore AB = 8 \text{ cm}$$



61. Ⓒ

$$DN = \sqrt{25 - 16} \text{ cm} = 3 \text{ cm}$$

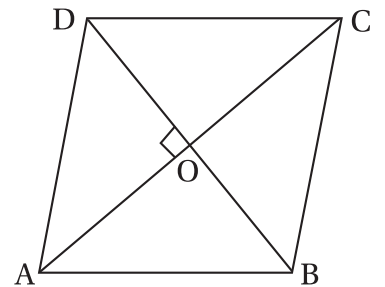
$$\therefore CD = 6 \text{ cm}$$

62. Ⓐ

$$\begin{aligned} \text{When } AB \parallel CD, \text{ then } MN &= OM + ON \\ &= (3 + 4) \text{ cm} \\ &= 7 \text{ cm} \end{aligned}$$

63. Ⓒ

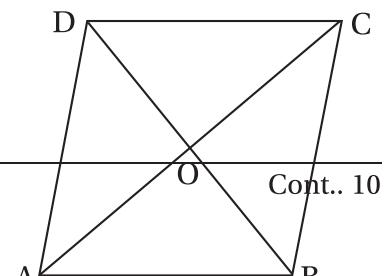
$$\begin{aligned} AB^2 &= AO^2 + BO^2 \\ &= \left(\frac{1}{2}AC\right)^2 + \left(\frac{1}{2}BD\right)^2 \\ &= \frac{1}{4}AC^2 + \frac{1}{4}BD^2 \\ \Rightarrow 4AB^2 &= AC^2 + BD^2 \end{aligned}$$



64. Ⓒ

$$\angle ACB = 40^\circ$$

$$\therefore \angle DAC = 40^\circ$$



$$\angle AOD = 90^\circ$$

$$\begin{aligned}\therefore \angle ADO &= 180^\circ - (90^\circ + 40^\circ) \\ &= 50^\circ\end{aligned}$$

$$\Rightarrow \angle ADB = 50^\circ$$

65. Ⓓ

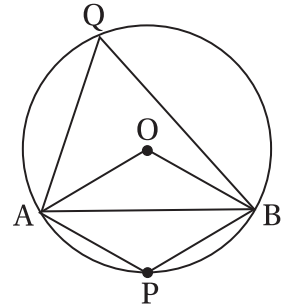
$$OA = OB = AB$$

$\Rightarrow \Delta OAB$ is equilateral

$$\therefore \angle AOB = 60^\circ$$

$$\therefore \angle AQB = 30^\circ$$

$$\therefore \angle APB = 180^\circ - 30^\circ = 150^\circ$$



66. Ⓓ

Let the angle be x°

$$\therefore 180^\circ - x^\circ = 3(90^\circ - x^\circ)$$

$$\Rightarrow 180 - x = 270 - 3x$$

$$\Rightarrow 2x = 90$$

$$\Rightarrow x = 45$$

$$\therefore \text{the angle} = 45^\circ$$

67. Ⓐ

$$\angle A = \angle B + \angle C$$

$$\text{But } \angle A + \angle B + \angle C = 180^\circ$$

$$\Rightarrow 2\angle A = 180^\circ \Rightarrow \angle A = 90^\circ$$

\therefore triangle is a right triangle.

68. Ⓐ

Let two numbers be x and y .

$$\therefore x + y = 12, \quad xy = 35$$

$$\therefore \frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy} = \frac{12}{35}$$

69. Ⓒ

$$A(3, 4), \quad B(-2, 5)$$

$$\begin{aligned} \therefore \text{abscissa of } A - \text{abscissa of } B \\ = 3 - (-2) = 3 + 2 = 5 \end{aligned}$$

70. (A)

$$2^x = 3^y = 6^z = K \text{ (let)}$$

$$\therefore 2 = K^{\frac{1}{x}}, 3 = K^{\frac{1}{y}}, 6 = K^{\frac{1}{z}}$$

$$\therefore 2 \times 3 = K^{\frac{1}{z}}$$

$$\Rightarrow K^{\frac{1}{x}} \times K^{\frac{1}{y}} = K^{\frac{1}{z}}$$

$$\Rightarrow K^{\frac{1}{x} + \frac{1}{y}} = K^{\frac{1}{z}}$$

$$\Rightarrow \frac{1}{x} + \frac{1}{y} = \frac{1}{z}$$

71. (A)

$$\angle ADC = \angle ABC = 56^\circ$$

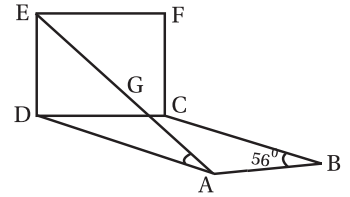
$$\therefore \angle ADE = 90^\circ + 56^\circ = 146^\circ$$

$$\begin{aligned} \therefore \angle DAE + \angle DEA &= 180^\circ - 146^\circ \\ &= 34^\circ \end{aligned}$$

$$DA = DC = DE$$

$$\Rightarrow \angle DAE = \angle DEA = 17^\circ$$

$$\therefore \angle DAG = 17^\circ$$



72. (A)

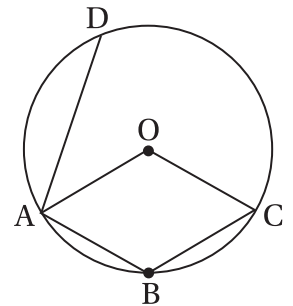
$$\angle ABC = 135^\circ$$

$$\begin{aligned} \angle ADC &= 180^\circ - 135^\circ \\ &= 45^\circ \end{aligned}$$

$$\angle AOC = 90^\circ$$

$$\therefore \text{length of arc } ABC = \frac{1}{4} \text{ of circumference}$$

$$\therefore \text{Ratio of length of arc } ABC \text{ to the circumference} = 1 : 4$$



73. (C)

$$\angle A + \angle B = 125^\circ, \angle A + \angle C = 113^\circ$$

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\therefore \angle B = 180^\circ - 113^\circ = 67^\circ$$

$$\therefore \angle A = 125^\circ - 67^\circ = 58^\circ$$

74. Ⓑ

exterior angle = 110°

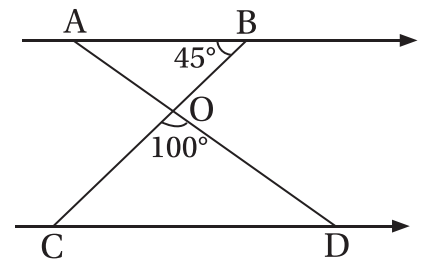
one interior opposite angle = 45° .

\therefore other opposite interior angle = $110^\circ - 45^\circ = 65^\circ$.

75. Ⓒ

$$\angle OCD = \angle ABO = 45^\circ$$

$$\begin{aligned} \therefore \angle CDO &= 180^\circ - (100^\circ + 45^\circ) \\ &= 180^\circ - 145^\circ = 35^\circ. \end{aligned}$$



Biology

76. Ⓓ

Fluid connective tissue

Blood has a fluid matrix, called plasma, and connects various parts of the body.

77. Ⓓ

Hyaline

It is a cartilage

78. Ⓐ

Articulation of bone and attachment of muscle.

Ligaments help in attaching bones at a joint. Tendons help to attach muscles to bones.

79. Ⓑ

Neuron

These are nerve cells which make up the nervous tissue.

80. Ⓐ

Brain cells

Neurons do not have centrosomes. So these cells cannot divide.

81. Ⓑ

Hind limb

Hind limb contains skeletal muscles which are voluntary in nature.

82. Ⓐ

Protein

83. Ⓑ

Both A and R are true but R is not the correct explanation of A.

These are individual functions of the two tissues.

84. Ⓑ

Both A and R are true but R is not the correct explanation of A.

The cells are branched for faster transmission of signals. They are involuntary as they cannot be controlled by our will.

85. Ⓒ

Cyton

86. Ⓒ

Short branched processes

87. Ⓓ

All the above statements are incorrect.

Adipose tissue is a loose connective tissue, stores fat. Tendons connect bones to muscles.

88. Ⓐ

Bone

89. Ⓒ

Cartilage

It prevents frictional damage at the ends of bones.

90. Ⓑ

WBC

91. Ⓓ

All of the above

92. Ⓒ



Vacuole

93. (A)

Membrane biogenesis - ER

94. (D)

Growth of plant

95. (D)

Sclerenchyma

It is a dead tissue.

96. (D)

Bone

The others are components of blood

97. (C)

Epidermal tissue

It is a plant tissue

98. (B)

Ciliated columnar epithelium

Pillar like cells with cilia at one end.

99. (A)

Mouth

The squamous cells of the mouth do not have cilia.

100. (B)

It helps in the forward movement of mucous

