Monthly Progressive Test

Class: IX

Subject: PCMB

Solutions (Set-G)

Physics

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1. Ⓐ

$v = u + at$ as $u = 0$ $\Rightarrow v = at$ or $v \propto t$

2. Ⓒ

$s = \left(\dfrac{1}{2}\right)(2)(2 \times 4 - 1) = 7 \text{ m}$

3. Ⓒ

$6 + \dfrac{1}{2} \cdot 3 \cdot t^2 = ut$ $\Rightarrow 3t^2 - 2ut + 12 = 0$

If $t = 2$ s then $u = 6$ m/s

4. Ⓐ

Slope of S–t graph = constant

5. Ⓑ

$H = \dfrac{u^2}{2g} = \dfrac{25}{2 \times 10}$ $\Rightarrow 10H = 12.5$

6. Ⓓ

$h = -ut + \dfrac{1}{2}gt^2$

$h = -(4.9)(2) + \dfrac{1}{2} \cdot 9.8 \times 2 \times 2$ $\Rightarrow \dfrac{h}{2} = -4.9 + 9.8 = 4.9 \text{ m}$

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[1]

7. Ⓒ

$$h = \frac{1}{2}gt^2 \quad \Rightarrow \frac{h}{t} = \frac{1}{2} \times 10 \times 10$$

8. Ⓓ

$$v^2 = 2gh = 2 \times 10 \times 1 = 20$$

$$v = \sqrt{20} \text{ m/s}$$

9. Ⓑ

$$h = \frac{1}{2} \cdot g \cdot t^2 \quad \Rightarrow 1 = \frac{1}{2} g \cdot t^2$$

$$t^2 = \frac{2}{10} = 0.2$$

$$t = \sqrt{(0.2)} \text{ s}$$

10. Ⓒ

Zero as there is no change in velocity

11. Ⓐ

As velocity is increasing

12. Ⓑ

As g = 10 m/s^2 (↓)

13. Ⓐ

$v = u + at$ put $a = 0$

14. Ⓑ

Area of velocity-time graph gives distance

$v - u = at$ = area under $a-t$ graph

15. Ⓒ

As no change in position

16. Ⓐ

$8 \times 60 + 20 = 500$ s

17. Ⓐ

$$\left[\frac{v-u}{t}\right] \Rightarrow \text{m/s}^2$$

18. Ⓑ

As $F \cdot t = mv - mu$

19. Ⓒ

As speed can't be negative

20. Ⓑ

time can't be negative. Two positions for same time is impossible.

21. Ⓑ

At same level, magnitude of upward velocity and downward velocity is same

22. Ⓑ

$$h = \frac{1}{2}gt^2 = \frac{1}{2} \cdot 10 \cdot (1)^2 = 5 \text{ m}$$

(from free fall)

23. Ⓒ

$v = 0$ m/s (instantaneously at rest)

24. Ⓓ

$v = gt = (10)(1) = 10$ m/s (from free fall)

25. Ⓐ

$v = 0$ but $a = g = 9.8$ m/s^2 (↓)

Chemistry

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26. Ⓓ

Sodium chloride is highly soluble in water and forms a colourless solution. On the other hand, chalk powder, sand and starch are insoluble.

27. Ⓒ

Sulphur is highly soluble in carbon disulphide while iron is insoluble.

28. Ⓓ

White coloured ammonium chloride is solid and sublimes readily and hence its liquid state is not possible at room temperature. But it is highly soluble in water.

29. Ⓒ

On gentle heating, ammonium chloride sublimes and gets deposited at the cooler part of the funnel. But at that temperature, common salt cannot achieve either its boiling point or melting point and hence solid sodium chloride stays on the china dish.

30. Ⓒ

At the first step the mixture is gently heated and amonium chloride sublimes and gets deposited at the cooler part of the system. On the next step, the sand and sodium chloride mixture is dissolved in water and is properly filtered. This filtration process separates the sand and the aqueous solution contains only sodium chloride. Now, proper evaporation gives the pure solid sodium chloride.

31. Ⓓ

Plasma, a fused ionic state is found in the stars and it is less abundant in the atmosphere. In the ionosphere , a small amount of plasma state is found due to ultraviolet ray from sun.

32. Ⓑ

Molecules, made up of same or different atoms can stay independently

33. Ⓒ

Mixture, an impure substance is made after the mixing of various pure components in various proportions.

34. Ⓓ

The elements chemically combine with each other to form compounds where the elements suffer the change in chemical and physical properties.

35. Ⓒ

The diagram is about chromatography.

36. Ⓑ

In case of chromatography, three different bands are developed on the filter paper at various lengths.

37. Ⓓ

Chromatography is the method of separation of various components in a mixture. It is used to separate a small amount of component present inside another component of large quantity.

38. Ⓓ

According to the given diagram, it is clear that it is for the separation of the components by using sublimation method. Now, NH_4Cl can sublime while sodium chloride and sugar cannot.

39. Ⓑ

The immiscible liquids form different layers as they do not mix with each other properly while miscible liquids are not associated with the formation of different layers.

40. Ⓐ

In case of evaporation, the energy of the liquid particles increases and intermolecular force of attraction decreases.

41. Ⓓ

Given formula is MCl_3. So, the valency of the metal is 3 as valency of chlorine is 1. Now, valency of oxygen is 2. So, the formula of oxide is M_2O_3.

42. Ⓒ

According to the question, this is associated with the latent heat. For the conversion of ice into water at $0°C$, latent heat is 80 cal/gm.

So, for 12 gm water or ice the heat change is $(80 \times 12) = 960$ cal

43. Ⓓ

When water is heated in a beaker then temperature increases regularly and after sometime temperature change becomes constant.

44. Ⓑ

With the increase in surface area and temperature, rate of evaporation increases and with the increase in humidity, rate of evaporation decreases. But the material of the vessel is a factor on which rate of evaporation does not depend.

45. Ⓓ

The element is $_{19}K^{39}$

So, number of electron = number of proton = 19

So, number of neutron = $(39 - 19) = 20$

46. Ⓒ

Wood is a mixture.

47. Ⓑ

When iron and sulphur are properly mixed, crushed and heated then they react with each other to form iron sulphide.

48. Ⓒ

Blood is considered as a mixture.

49. Ⓓ

Tyndal effect is shown by colloidal solutions only and particles are very small in size.

50. Ⓓ

Salt solution is a true solution and it does not show Tyndall effect as it is shown only by colloidal solutions.

Mathematics

51. Ⓒ

$x = y$

$x - z = y - z$ ($\because$ Equal value can be subtracted from both sides of equals to remain the result same)

52. Ⓓ
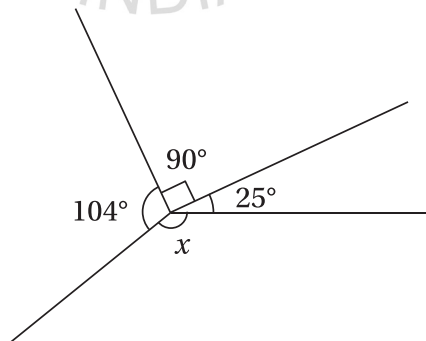
Let x be the angle its complement angle $= (90° - x)$

Its complement angle $= (90° - x)$

Its supplement angle $= (180° - x)$

ATQ, $(180° - x) = 3(90° - x)$ $\Rightarrow 180° - x = 270° - 3x$ $\Rightarrow -x + 3x = 270° - 180°$

$\Rightarrow 2x = 90°$ $\Rightarrow x = 45°$

53. Ⓐ

ATQ, $104° + 90° + 25° + x = 360°$ $\Rightarrow 219° + x = 360°$ $\Rightarrow x = 141°$

54. Ⓑ

Let $\angle A + \angle B = 116°$ and $\angle A - \angle B = 24°$

$\therefore \angle A = \dfrac{116° + 24°}{2} = 70°$ $\angle B = \dfrac{116° - 24°}{2} = 46°$ $\therefore \angle C = 180° - (70° + 46°) = 180° - 116° = 64°$

55. Ⓐ

$x + y + z = 180 \qquad \Rightarrow x + x = 180 \qquad \Rightarrow 2x = 180 \qquad \boxed{x = 90}$
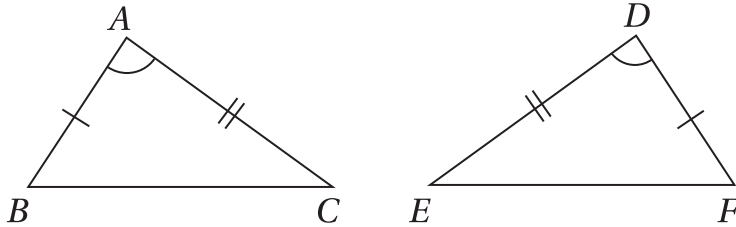
$\angle A = 90°$

Hence, the triangle is a right triangle.

Given $x = y + z$

56. Ⓑ
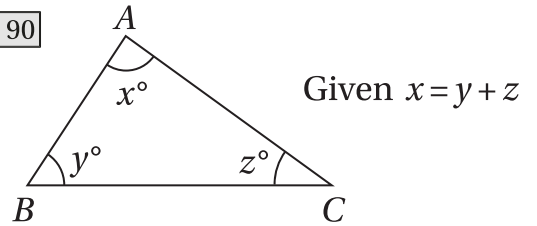
$AC = DE$

In $\triangle ABC$ and $\triangle DFE$,
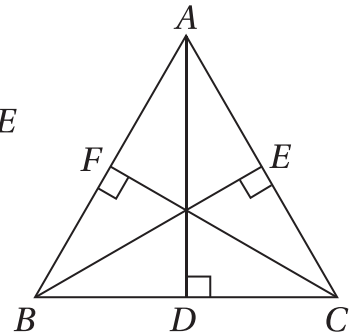$\angle A = \angle D; \qquad AB = DF$
For SAS axiom
$AC = DE$

57. Ⓐ

Given : AD = BE = CF.

In $\triangle ADC$ and $\triangle BEC$, $AD = BE$, $\angle ADC = \angle BEC$ and $\angle ACD = \angle BCE$

$\therefore \ \triangle ADC \cong \triangle BEC \,(\text{A–A–S}) \qquad \therefore \ AC = BC \,(\text{c·p·c·t})$

Similarly, AB = AC $\qquad \therefore \ AB = AC = BC$

58. Ⓓ

a theorem.

59. Ⓒ

$90°00' \ \rightarrow \ 89°60'$

$72°40' \ \rightarrow \ 72°40'$

_____

$\qquad\qquad 17°20'$

60. Ⓐ

SSA

61. Ⓑ

A : True

B : True. But (R) is not a correct explanation of (A)

62. Ⓐ

A : 50 + 70 = 120
3rd Angle = (180 – 120) = 60° True
B : True

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63. Ⓑ

$y + 4y + 60° = 180°$ (straight angle)

$5y = 120° \Rightarrow y = 24°$

$x = 4y$ (vertically opposite angles)

$\therefore x = 96°$

64. Ⓓ

Solved in Q.63

65. Ⓒ

$\Rightarrow 2z = y + 60°$ (vertically opposite angles)

$\Rightarrow 2z = 24° + 60° = 84° \qquad \Rightarrow z = 42°$

66. Ⓓ

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

67. Ⓓ

any number.

68. Ⓓ

$p(x) = x + 4$

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

$\overline{}$

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

69. Ⓓ

$\dfrac{x+y}{xy} = 2013 \qquad \Rightarrow \dfrac{2013}{xy} = 2013 \qquad \Rightarrow xy = 1$

70. Ⓑ

2nd Quadrant

$(-,+)$		$(+,+)$
Q_2	Q_1	
$(-5,3)\bullet$		
	Q_3	Q_4
$(-,-)$		$(+,-)$

71. Ⓐ

Let $5x$ cm, $12x$ cm, $13x$ cm be the side length.

ATQ, $13x = 26$ $\quad \therefore x = 2$

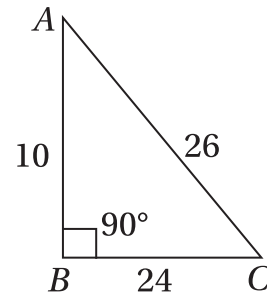$5x$ cm, $12x$ cm, $13x$ cm

$\Rightarrow$ 10 cm, 24 cm, 26 cm.

$\therefore$ Shortest side = 10 cm

72. Ⓒ

Three sides are 10 cm, 24 cm, 26 cm

$\therefore 10^2 + 24^2 = 26^2 \quad \Rightarrow$ Right triangle

$\therefore$ largest angle = 90°

73. Ⓑ

$\text{Area} = \dfrac{1}{2} \times 24 \times 10 \text{ cm}^2 = 120 \text{ cm}^2$

74. Ⓐ

A : $\triangle PMO \cong \triangle P'M'O'$ True

R : R.H.S True

75. Ⓑ

A : $\triangle ABC \cong \triangle A'B'C'$ (by SAS) True

R : ASA is a condition of congruency but it is not the correct explanation for the assertion (A).

Biology
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76. Ⓑ

Collenchyma

77. Ⓐ

Presence of chloroplasts

78. Ⓓ

Growth of plants

Meristematic tissue consists of cells which are in a constant state of division

79. Ⓐ

Parenchyma

80. Ⓒ

Complex tissue

Both are made up of four types of cells

81. Ⓒ

Pectin

82. Ⓓ

Silk

Silk is obtained from silkworms

83. Ⓒ

Hydrophyte

To provide buoyancy

84. Ⓒ

A is true but R is false

All the three are types of simple tissues made up of the same type of cells

85. Ⓓ

A is false but R is true

Xylem and phloem together make up the complex tissues

86. Ⓓ

Apical meristem

It is a type of meristematic tissue

87. Ⓓ

Both A and B

88. Ⓒ

Sclerenchyma

89. Ⓐ

Sclerenchyma

90. Ⓐ

1

Only phloem fibres are dead

91. Ⓑ

Rigid & non living

92. Ⓑ

RBC

93. Ⓐ

Lipids and steroids

94. Ⓒ

Leucoplast

95. Ⓑ

Chloroplast

96. Ⓓ

All

97. Ⓑ

Xylem

98. Ⓓ

Sclerenchyma

Its a dead tissue

99. Ⓒ

A is true but R is false

100. Ⓓ

Companion cells

They are a component of phloem