Monthly Progressive Test

Class: VIII

Subject: PCMB (S)

Test Booklet No.: MPT05	Test Date: 22/08/2024
Time: 180 mins	Full Marks: 200

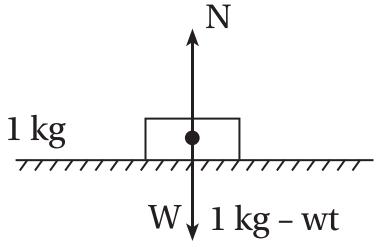
Solutions

Physics

1. Ⓑ

Two – weight downward and tension upward

2. Ⓒ



N = 1kg – wt

$W = mg = 1kg \times g\ ms^{-2} = g\ N = 1\ kg\ wt.$

3. Ⓒ

Like in case of walking

4. Ⓒ

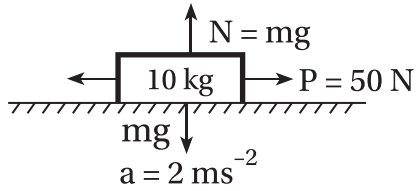
As P = hpg

5. Ⓑ

50 – f = 10.2

$\Rightarrow$ 50 – μ mg = 10.2

$\Rightarrow$ 50 – μ .10.10 = 20



$g = 10\ ms^{-2}$

Cont.. 2

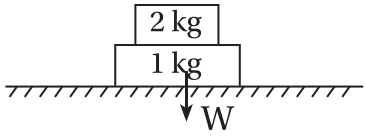
$\Rightarrow 50 - 20 = 100\ \mu$

$\Rightarrow \mu = \frac{30}{100} = 0.3$

6. Ⓓ

$P = pgh$

7. Ⓑ



$N = W = (1 + 2) \times 9.8\ N$

$= 29.4\ N$

8. Ⓓ

1 atm pressure

$= pgx$

$= 10^3\ kg.m^{-3} \times 10 ms^{-2} \times x\ m = 1.014 \times 105\ Nm^{-2}$

$\Rightarrow 10^4\ kg.m.s^{-2}.m^{-2}.\ x = 1.014 \times 10^5\ N.m^{-2}$

$\Rightarrow 10^4\ Nm^{-2}.x = 1.014 \times 10^5\ N.m^{-2}$

$\Rightarrow x = 10.14\ m$

$\Rightarrow x \simeq 10\ m$

9. Ⓐ

There will be a force acting downwards on the water causing additional pressure over and above atmospheric pressure.

$P > hpg.$

10. Ⓑ

Buoyout force or upthrust by the air

11. Ⓓ

Both are attractive as well as repulsive in nature

12. Ⓑ

Spring balance measure weight

13. Ⓓ

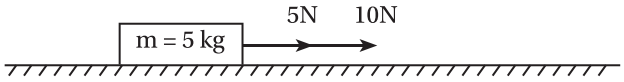
We will be unable to walk, write and hold

14. Ⓒ

Book C has more friction as normal force is increasing

15. ©

$10N + 5N = 15N \qquad \therefore\ a = \frac{15}{5} = 3\,m/s^2$



16. Ⓐ

17. Ⓐ

18. Ⓐ

Air

19. Ⓑ

In absence of air

20. Ⓑ

It will be safe

21. ©

Friction helps us to walk

22. Ⓑ

Crest to next crest separation is time period

23. Ⓑ

$f = 1\ HZ$

$\lambda = 1\ m$

$v = f\ \lambda = 1 \times 1 = 1\ ms^{-1}$

24. ©

$f = 800\ MHz = 800 \times 10^6 Hz = 8 \times 10^8 Hz$

$\lambda = ?$

$c = 3 \times 10^8 ms^{-1}$

$\lambda = \frac{c}{f} = \frac{3\times10^8}{8\times10^8}\,m = 0.38\,m$

25. Ⓓ

$V_{air} < V_{water} < V_{steel}$

26. Ⓓ

Electric current can result heating effect (glowing of a bulb), chemical effect (electrolysis and electroplating) and magnetic effect (deflection of the needle of compass when it is taken close to a live wire)

27. Ⓓ

Aqueous solution of sodium chloride, silver nitrate, copper sulphate all can easily produce ions hence they are the good conductors of electricity. But sugar solution cannot produce ions hence it cannot conduct electric current.

28. Ⓒ

Iron nail is a good conductor of electricity.

29. Ⓑ

A bulb glows due to heating effect of current

30. Ⓑ

At the thunderstorm, rain occurs. Thus air becomes good conductor of electric current.

31. Ⓓ

Conduction of electric current depends only on the presence of free electron(s) not on the shape, size, colour of the body.

32. Ⓒ

A tester is used the check the presence of electric current in a body.

33. Ⓑ

Sand paper removes dirt from the surface of the copper wire and hence it can conduct electrical current very well as dirt increases the resistance of the body.

34. Ⓑ

In case of LED, the shorter terminal is connected with the negetive terminal of the battery while longer terminal is connected with the positive terminal of battery.

35. Ⓐ

Calcium chloride ionizes very easily into calcium cation (Ca^{2+}) and chloride anion (Cl^{-}). Both are responsible to conduct electric current

36. Ⓐ

Vinegar contains ethanoic acid or acetic acid and it readily reacts with iron. Thus the

experiment cannot be done properly.

37. Ⓓ

Acidic, basic and salt solutions are good conductors of electricity as they contain ions.

38. Ⓒ

In case of ringing the bell, electrical energy is converted into mechanical energy.

39. Ⓓ

Conductors can be solid, liquid and gaseous.

40. Ⓑ

Rubber is an insulator i.e. does not conduct electricity.

41. Ⓒ

The fuel used in the given process, contains carbon and incomplete combustion of that fuel causes the formation of black coating of carbon at the outer part of the cooking vessel.

42. Ⓒ

LPG has the highest calorific value as it is a gaseous fuel and it contains more number of highly inflamable components hence it has higher calorific value than bio-gas.

43. Ⓑ

According to the given informations about the given fuels P, Q, R the correct order of flamability is R > Q > P. So, fuel 'Q' will undergo spontaneous combustion without any supply of huge amount energy from outside.

44. Ⓒ

In the outermost zone of a candle flame highest amount of oxygen gas is supplied. Hence complete combustion occurs there. So, carbon dioxide and water vapour are the final products

45. Ⓑ

Ignition temperature is defined as the minimum temperature attaining which a fuel starts to burn.

46. Ⓓ

When current passes through a wire then a magnetic field is developed and hence the needle of a compass starts to deflect. If power supply is stopped, then deflection also stops.

47. Ⓒ

When a bulb glows then electrical energy is converted into heat energy.

48. Ⓑ

The term circuit is associated with the passage of current through a closed path by which some useful work is obtained.

49. Ⓑ

Only bulb has filament.

50. Ⓒ

When electrical appliances are touched by wet hands then it can conduct electricity if there is any type of leakage is there. It can be fatal and may cause death of the person.

Mathematics

51. Ⓒ

S.P. = ₹1470, p% = $\frac{50}{3}$%

$\therefore$ C.P. = ₹ $\frac{1470\times100}{(100+\frac{50}{2})}$

= ₹ $\frac{\cancel{1470}^{21}\times\cancel{100}^{20}\times3}{\cancel{350}_{5}}$ = ₹1260

52. Ⓐ

C.P. = ₹(1200 + 200) = ₹1400

S.P. = ₹1680

$\therefore$ Profit = ₹(1680 – 1400) = ₹280

$\therefore$ Profit% = $\frac{280}{1400}\times100\% = 20\%$

53. Ⓐ

$21952 = 15625\left(1+\frac{r}{100}\right)^3$

$\Rightarrow \frac{21952}{15625} = \left(1+\frac{r}{100}\right)^3$

$\Rightarrow \left(\frac{28}{25}\right)^3 = \left(1+\frac{r}{100}\right)^3$

$\Rightarrow \frac{28}{25} = 1 + \frac{r}{100}$

$\Rightarrow \frac{r}{100} = \frac{3}{25}$

$\Rightarrow r = 12$

$\therefore$ rate of interest = 12% p.a.

54. Ⓓ

Let the sum be ₹x

$\therefore 12100 = x\left(1 + \frac{10}{100}\right)^2$

$\Rightarrow 12100 = x \times \left(\frac{11}{10}\right)^2$

$\Rightarrow 12100 = x \times \frac{|2|}{100}$

$\Rightarrow x = 10000$

$\therefore$ The sum = ₹10000

55. Ⓒ

No. of diagonals = 9

$\therefore \frac{n(n-3)}{2} = 9$

$\Rightarrow n(n-3) = 18 = 6 \times 3 = 6(6-3)$

$\therefore n = 6$

56. Ⓑ

Ratio of exterior angles of a polygon

= 1 : 2 : 3 : 4 : 5.

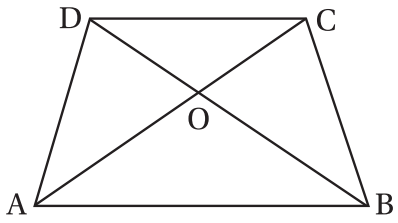
$\therefore$ smallest exterior angle $= \frac{1}{5} \times 360°$

$= 24°$

$\therefore$ largest interior angle = 180° – 24°

= 156°

57. Ⓓ



Triangles are ΔAOB, ΔBOC, ΔCOD, ΔAOD, ΔABC, ΔADC, ΔABD, ΔBCD

∴ total number of triangles = 8

58. ©

Let C.P. = ₹100

∴ M.P. = ₹120

Discount = ₹120 × $\frac{10}{100}$ = ₹12

∴ S.P. = ₹(120 – 12) = ₹8

∴ gain% = $\frac{8}{100} \times 100\% = 8\%$

(A) is true

S.P. = M.P. – discount

and discount = M.P. × discount%

∴ (R) is false.

59. Ⓐ

C.P. : S.P. = 10 : 11

Let S.P. = ₹11x ∴ C.P. = ₹10x

∴ gain = ₹(11x – 10x) = ₹x

∴ gain% = $\frac{x}{10x} \times 100\% = 10\%$

∴ (A) is true

(R) : gain% = $\frac{\text{gain}}{\text{C.P.}} \times 100\%$ True.

60. Ⓓ

Number of bacteria at the end of 2 hours

$= 50000\left(1+\frac{2}{100}\right)^2$

$= 50000 \times \frac{51}{50} \times \frac{51}{50}$

$= 52020$

61. Ⓒ

$100000 = 50000\left(1+\frac{2}{100}\right)^n$

$\Rightarrow\ 2 = (1.02)^n$

$\Rightarrow\ (1.02)^{35} = (1.02)^n$

$\Rightarrow\ n = 35$

62. Ⓐ

No. of bacteria $= 500\left(1+\frac{2}{100}\right)^{24}$

$= 500\,(1.02)^{24}$

$= 500 \times 1.6$

$= 800$

63. Ⓓ

$(n-2) \times 180° : 540° = 4 : 1$

$\Rightarrow\ (n-2) : 3 = 4 : 1$

$\Rightarrow\ \frac{n-2}{3} = \frac{4}{1}$

$\Rightarrow\ n - 2 = 12$

$\Rightarrow\ n = 14$

64. Ⓐ

$x° = \frac{540°}{5} = 108° \ \Rightarrow\ x = 108$

$y° = \frac{720°}{6} = 120° \ \Rightarrow\ y = 120$

$\therefore\ x : y = 108 : 120 = 9 : 10$

65. Ⓓ

$\angle TPQ = 60°$ $\therefore$ $\angle SPT = 90° - 60° = 30°$

$\angle PSQ = 45°$ $\therefore$ $x = 180° - (30° + 45°)$

$= 180° - 75° = 105°.$

66. Ⓒ

Let the number be x.

$$\therefore \quad x + \frac{\cancel{45}^{9}\, x}{\cancel{200}_{40}} = 98$$

$$\Rightarrow \quad \frac{49x}{40} = 98$$

$$\Rightarrow \quad x = 80$$

67. Ⓓ

$$a^2 + 1 = -\sqrt{2}a$$

$$\Rightarrow \quad a + \frac{1}{a} = -\sqrt{2}$$

$$\Rightarrow \quad a^2 + \frac{1}{a^2} + 2 = 2$$

$$\Rightarrow \quad a^2 + \frac{1}{a^2} = 0$$

$$\therefore \quad \frac{a^4 + a^2 + 1}{a^2} = a^2 + 1 + \frac{1}{a^2}$$

$$= 0 + 1 = 1$$

68. Ⓒ

$$(1)^{-1} + \left(\frac{1}{2}\right)^{-1} + \left(\frac{1}{3}\right)^{-1}$$

$= 1 + 2 + 3 = 6$

69. Ⓐ

$$\sqrt[3]{\frac{343 \times 125}{0.064}} = \frac{7 \times 5}{0.4} = \frac{7 \times 5 \times \cancel{10}^{5}}{\cancel{4}_{2}}$$

$$= \frac{175}{2} = 87.5$$

70. Ⓐ

0 has no reciprocal.

71. Ⓒ

For $n = 6$, no. of diagonals $= \dfrac{6\times(6-3)}{2}$

$= 9$

$\therefore$ (A) is true

(R) : No. of diagonals of a polygon having n sides $= \dfrac{n(n+1)}{3}$ which is false.

72. Ⓐ

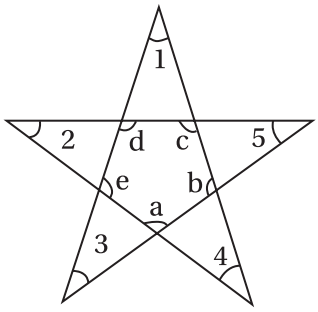
$\angle 1 + \angle 3 + b = 180°$

$\angle 2 + \angle 5 + a = 180°$

$\angle 2 + \angle 4 + c = 180°$

$\angle 3 + \angle 5 + d = 180°$

$\angle 1 + \angle 4 + e = 180°$



$\therefore\ 2(\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5) + a + b + c + d + e = 900°$

$\Rightarrow\ 2(\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5) + 540° = 900°$

$\Rightarrow\ 2(\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5) = 360°$

$\Rightarrow\ \angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5 = 180°.$

$\therefore$ (A) is true.

(R) : sum of three angles of a triangle = 180° which is true.

Also (R) is the correct explanation of (A).

73. Ⓐ

$x + 20° + x + 120° + 80° = 360°$

$\Rightarrow\ 2x = 360° - 220° = 140°$

$\Rightarrow\ x = 70°$

74. Ⓒ

smallest angle = 70° which is at R.

75. Ⓑ

largest angle = 120° which is at Q.

Biology

76. Ⓒ

Improved water quality and reduced soil erosion

Plants slow down the speed of flowing water increasing its percolation through the soil. Roots of plants hold the soil firmly, reducing soil erosion

77. Ⓐ

Conservationists and policy makers

78. Ⓑ

A food web shows multiple interconnected food chains in an ecosystem.

A food chain is a linear representation of the various trophic levels. A food web is a system of interconnected food chains.

79. Ⓒ

Improvement in ecosystem balance

80. Ⓒ

Seeking better living conditions, breeding grounds or food resources.

81. Ⓐ

Endangered species.

82. Ⓒ

Its limited geographical range.

83. Ⓑ

Conserving animal habitats.

It is a means of in situ conservation

84. Ⓑ

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

Depletion of biodiversity can have various adverse consequences, loss of livelihood being one of them.

85. Ⓐ

Both A and R are true and R is the correct explanation of A.

86. Ⓓ

All

All lead to destruction of the local flora and fauna.

87. Ⓒ

3

Transition, Buffer and Core zones

88. Ⓐ

Core zone

This area is reserved strictly for the conservation of biodiversity.

89. Ⓓ

All of the above

90. Ⓑ

Madhya Pradesh

91. Ⓒ

Improved water conservation

Modern methods of irrigation economises usage of water.

92. Ⓐ

Dairy products

Dairy products contain calcium

93. Ⓓ

They have more fats in them

94. Ⓒ

They breakdown dead organisms and organic matter

95. Ⓓ

All

96. Ⓒ

iii & iv

In a Wildlife sanctuary or a National park, biodiversity is conserved within their habitats.

97. Ⓓ

Capturing and poaching of animals is strictly prohibited here.

98. Ⓐ

Fauna

These are examples of the animals in the forest

99. Ⓒ

iii & iv

The Red Data Book is concerned with keeping a record mainly of the species facing a risk of extinction.

100. Ⓐ

The roots of the trees hold the top layer of the soil firmly.