

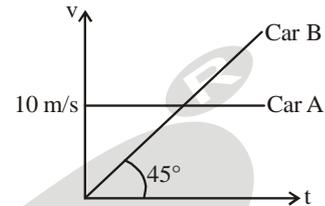
SAMPLE PAPER - 67

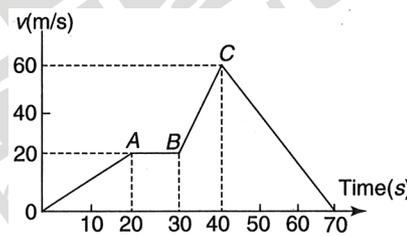
Time : 1 : 15 Hr.

Question : 60

PHYSICS

01. A train 200 m long crosses a bridge 300 m long. It enters the bridge with velocity 30 ms^{-1} and leaves it with velocity 50 ms^{-1} . What is the time taken to cross the bridge ?
 (1) 2.5 s (2) 7.5 s (3) 12.5 s (4) 15.0 s
02. A ball released from the top of a tower travels $\frac{11}{36}$ of the height of the tower in the last second of its journey. the height of the tower is (Take $g = 10 \text{ ms}^{-2}$)
 (1) 11 m (2) 36 m (3) 47 m (4) 180 m
03. A particle has an initial velocity of 9 m/s due east and a constant acceleration of 2 m/s^2 due west. The distance covered by the particle in the fifth second of its motion is:
 (1) 0 (2) 0.5 m
 (3) 2 m (4) none of these
04. The area under velocity-time graph for a particle in a given interval of time represents
 (1) velocity (2) acceleration
 (3) work done (4) displacement
05. A bullet moving with a velocity of 100 m/s can just penetrate two planks of equal thickness. The number of such planks penetrated by the same bullet, when the velocity is doubled, will be
 (1) 4 (2) 6 (3) 8 (4) 10
06. A man moves on his motorbike with 54 km/h and then takes a U-turn and continues to move with same speed. The time of U-turn is 10 s. Find the magnitude of average acceleration during U-turn
 (1) 0 (2) 3 ms^{-2}
 (3) $1.5\sqrt{2} \text{ ms}^{-2}$ (4) none of these
07. Initially car A is 10.5 m ahead of car B. Both start moving at time $t = 0$ in the same direction along a straight line. The velocity-time graph of two cars is shown in figure. The time when the car B will catch the car A, will be



- (1) $t = 21 \text{ s}$ (2) $t = 2\sqrt{5} \text{ s}$
 (3) 20 s (4) none
08. The velocity-time graph of a body is given below. Find the average velocity from $t = 0$ to $t = 40 \text{ s}$
- 
- (1) 20 m/s (2) 40 m/s
 (3) 50 m/s (4) 60 m/s
09. A particle is thrown upwards from ground. It experiences a constant air resistance force which can produce a retardation of 2 m/s^2 . The ratio of time of ascent to the time of descent is
 (1) 1 : 1 (2) $\sqrt{\frac{2}{3}}$ (3) $\frac{2}{3}$ (4) $\sqrt{\frac{3}{2}}$
10. A ball is thrown upward with such a velocity v that it returns to the thrower after 3 s. Take $g = 10 \text{ ms}^{-2}$. Find the value of v .
 (1) 15 m/s (2) 20 m/s (3) 10 m/s (4) 5 m/s
11. An aeroplane is flying horizontally with a velocity of 720 km/hr and at a height of 1960 m. When it is vertically above a point A on the ground, a bomb is released from it. The bomb strikes the ground at a point B. The distance AB is (ignoring air resistance)
 (1) 2 km (2) 4 km
 (3) 1 km (4) None of these

12. A cricketer can throw a ball to a maximum horizontal distance of 100 m. With the same speed how much high above the ground can the cricketer throw the same ball?
 (1) 50 m (2) 100 m
 (3) 150 m (4) 200 m
13. Two balls are projected at an angle θ and $(90^\circ - \theta)$ to the horizontal with the same speed. The ratio of their maximum vertical heights is
 (1) 1 : 1 (2) $\tan \theta : 1$
 (3) $1 : \tan \theta$ (4) $\tan^2 \theta : 1$
14. A particle has initial velocity $(2\hat{i} + 3\hat{j})$ and acceleration $(0.3\hat{i} + 0.2\hat{j})$. The magnitude of velocity after 10 seconds will be
 (1) 9 units (2) $9\sqrt{2}$ units
 (3) $5\sqrt{2}$ units (4) 5 units
15. At the uppermost point of a projectile its velocity and acceleration are at an angle of
 (1) 180° (2) 90° (3) 60° (4) 45°

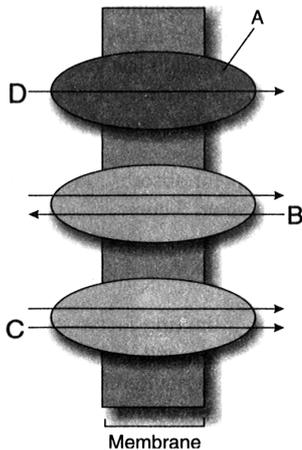
CHEMISTRY

16. A molal solution is one that contains one mole of a solute in
 (1) 1000 g of the solvent
 (2) one litre of the solvent
 (3) one litre of the solution
 (4) 22.4 litres of the solution
17. Which of the following changes with increase in temperature?
 (1) Molality
 (2) Weight fraction of solute
 (3) Fraction of solute present in water
 (4) Mole fraction
18. 6.02×10^{20} molecules of urea are present in 100 mL of its solution. The concentration of solution is
 (1) 0.02 M (2) 0.01 M (3) 0.001 M (4) 0.1 M
19. 0.106 g of an acid is titrated with 0.1 N 20 mL of an base. The equivalent weight of the acid is
 (1) 63 (2) 50 (3) 53 (4) 23
20. What volume of CO_2 will be liberated at NTP, if 1.2 g of carbon is burnt in excess of oxygen?
 (1) 11.2 L (2) 22.4 L (3) 2.24 L (4) 1.12 L
21. The equivalent weight of phosphoric acid (H_3PO_4) in the reaction,
 $2\text{NaOH} + \text{H}_3\text{PO}_4 \longrightarrow \text{Na}_2\text{HPO}_4 + 2\text{H}_2\text{O}$ is
 (1) 59 (2) 49 (3) 25 (4) 98
22. When 20 mL of propane (gas) is combusted completely, the volume of $\text{CO}_2(\text{g})$ obtained in similar condition is
 (1) 10 mL (2) 20 mL
 (3) 30 mL (4) 60 mL
23. A mixture contains 5.4 g of Al, 1.2 g of Mg and 4.6 g of $\text{C}_2\text{H}_5\text{OH}$. The ratio of their moles is
 (Atomic weights of Al = 27 u, Mg = 24 u, C = 12 u, O = 16 u, H = 1 u)
 (1) 4 : 1 : 2 (2) 2 : 1 : 5
 (3) 2 : 1 : 4 (4) 2 : 3 : 4
24. The pair of species having same percentage of carbon is-
 (1) CH_3COOH and $\text{C}_6\text{H}_{12}\text{O}_6$
 (2) CH_3COOH and $\text{C}_2\text{H}_5\text{OH}$
 (3) HCOOCH_3 and $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
 (4) $\text{C}_6\text{H}_{12}\text{O}_6$ and $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
25. 60 mL of $\frac{\text{N}}{2} \text{H}_2\text{SO}_4$, 10 mL of N HNO_3 and 30 mL of $\frac{\text{N}}{3} \text{HCl}$ are mixed together. The strength of the resulting mixture is
 (1) 0.10 N (2) 0.2 N
 (3) 0.5 N (4) 0.4 N
26. A gas mixture contains O_2 and N_2 in the ratio of 1 : 4 by weight. The ratio of their number of molecules is
 (1) 1 : 8 (2) 1 : 4
 (3) 3 : 16 (4) 7 : 32
27. Calculate the mass of urea (NH_2CONH_2) required in making 2.5 lit. of 0.25 molar aqueous solution.
 (1) 37.5 g (2) 36.9 g
 (3) 53.7 g (4) 75.3 g
28. In the synthesis of ammonia
 $\text{N}_2(\text{g}) + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3(\text{g})$
 If the quantity of N_2 reacted is 50 mL, the quantity of H_2 and NH_3 would be
 (1) 300 mL H_2 and 200 mL NH_3
 (2) 300 mL H_2 and 300 mL NH_3
 (3) 150 mL H_2 and 100 mL NH_3
 (4) 100 mL H_2 and 200 mL NH_3
29. 100 g of hydrogen and 32 g of oxygen were filled in a steel vessel and exploded. Amount of water produced in this reaction will be
 (1) 3 mol (2) 4 mol
 (3) 1 mol (4) 2 mol
30. The atomic weights of two elements A and B are 40 and 80 respectively. If x g of A contains y atoms, how many atoms are present in 4x g of B?
 (1) $\frac{y}{2}$ (2) $\frac{y}{4}$
 (3) y (4) 2y

43. What is the approximate rate of ascent of sap?
 (1) 5 m/hr (2) 15 m/hr
 (3) 40 m/hr (4) 2 m/hr

44. Which of the following undergoes multi-directional transport?
 (1) Water (2) Mineral nutrients
 (3) Organic nutrients (4) Both (2) and (3)

45. Identify A to E in the given figure.



- (1) A: Antiport B, B: Uniport A, C: Antiport A, D: Symport B, E: Carrier point
 (2) A: Carrier point, B: Antiport A, C: Uniport A, D: Symport B, E: Antiport B
 (3) A: Carrier point, B: Antiport C: Symport D: Uniport
 (4) A: Symport B, B: Antiport A, C: Antiport B, D: Carrier point, E: Uniport A

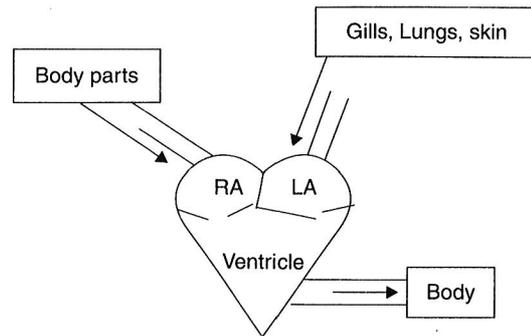
ZOOLOGY

46. Select the incorrect statement from the following.
 (1) Clot or coagulum is formed mainly by network of fibrin in which died and damaged formed element of blood are trapped.
 (2) Inactive fibrinogen is converted to fibrin by hormone thrombin.
 (3) Prothrombin is converted into thrombin by the enzyme complex called thrombokinase.
 (4) Platelet or injured tissue released certain factors which initiate coagulation.

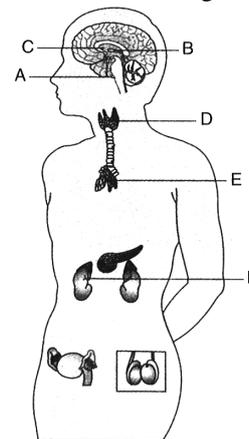
47. Blood is a special type of connective tissue which
 (1) Consists of a fluid matrix (Plasma).
 (2) Formed elements.
 (3) Most commonly used body fluid by most of the higher organism.
 (4) All the above

48. Lymph
 (1) Transport oxygen to brain.
 (2) Transport CO_2 to lungs
 (3) Returns interstitial fluid to blood
 (4) returns RBCs and WBCs to lymph nodes.

49. In the following diagram, the circulation is found in



- (1) Ambhbian (2) Reptiles
 (3) Both (1) and (2) (4) Birds
50. Pulmonary circulation is required for
 (1) Nuterient supply to lungs
 (2) Elimination of waste products from the lungs.
 (3) Oxygenation of deoxygenated blood.
 (4) Nutrient supply to heart
51. A unique vascular connection existing between the hypothalamus and pituitary gland is called
 (1) Renal portal system
 (2) Hypophyseal portal system
 (3) hepatic portal system
 (4) All of these
52. During cardiac cycle each ventricle pumps out about 70 ml of blood and it is called
 (1) Stroke volume
 (2) Cardiac output
 (3) Tidal volume
 (4) Residual volume
53. Identify A, B, C, D, E and F in the given figure.



- (1) A: Hypothalamus, B: Pineal, C: Thymus, D: Adrenal, E: Pituitary, F: Thyroid and Parathyroid.
 (2) A: Pituitary, B: Pineal, C: Hypothalamus, D: Thyroid and parathyroid, E: Thymus, F: Adrenal.
 (3) A: Thymus, B: Pituitary, C: Thyroid and parathyroid, D: Pineal, E: Hypothalamus, F: Adrenal.
 (4) A: Pineal, B: Thyroid and Parathyroid, C: Pituitary, D: Hypothalamus, E: Adrenal, F: Pineal

54. Hypothalamus is
(1) Roof of diencephalon.
(2) Basal part of diencephalon
(3) Lateral wall of diencephalon
(4) All of the above
55. Pars intermedia secretes (Only one hormone)
(1) Follicle stimulating hormone
(2) Melanocyte stimulating hormone
(3) Melatonin
(4) Prolactin
56. Which of the below hormone stimulates the synthesis and secretion of thyroxin
(1) GH (Growth hormone)
(2) TSH (Thyroid stimulating hormone)
(3) PRL (Prolactin)
(4) ACTH (Adrenocorticotrophic hormone)
57. Over secretion of GH (growth hormone) in child leads to
(1) Dwarfism (2) Cretinism
(3) Gigantism (4) Tetany
58. The features of cretinism include
(1) Stunted growth
(2) Mental retardation and low IQ.
(3) Abnormal skin and deaf mutism.
(4) All of these
59. Pineal gland is located on
(1) Dorsal side of midbrain.
(2) Dorsal side of hindbrain.
(3) Dorsal side of forebrain.
(4) Vertical side of forbrain.
60. Emergency hormone or hormones of fight or flight are
(1) Adrenaline (2) Noradrenaline
(3) Cortisol (4) Both (1) and (2)

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