

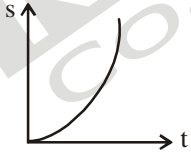


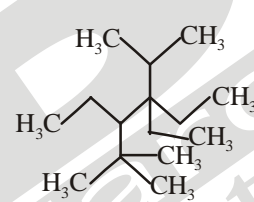
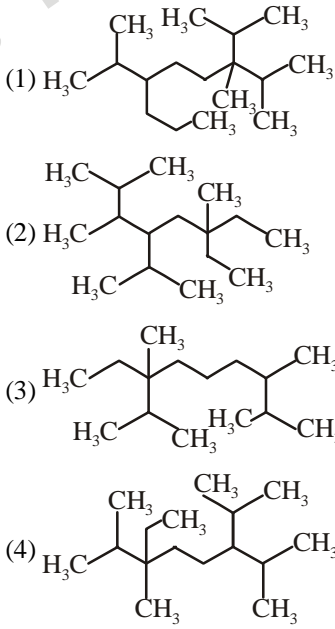
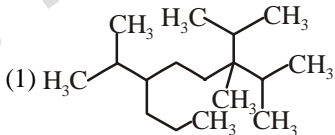
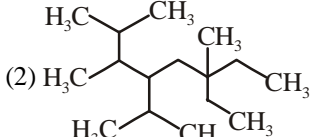
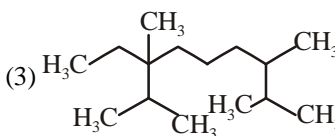
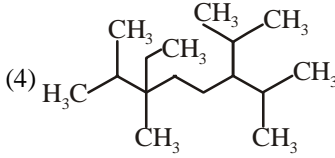
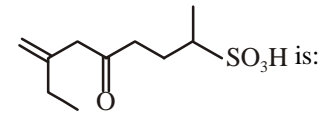
SAMPLE PAPER - 36

Time : 1 : 15 Hr.

Question : 60

PHYSICS

01. A body starting from rest is accelerated uniformly for 15 s. If x_1 , x_2 , x_3 are the distance travelled in 1st 5 s, next 5 s and last 5 s, then $x_1 : x_2 : x_3 =$
 (1) 1 : 2 : 3 (2) 1 : 1 : 1 (3) 1 : 3 : 5 (4) 1 : 3 : 9
02. Mark the wrong statement for a particle going on a straight line :
 (1) If the velocity and acceleration have opposite sign, the object is slowing down.
 (2) If the position and velocity have opposite sign, the particle is moving towards the origin
 (3) If the velocity is zero at an instant, the acceleration should also be zero at that instant
 (4) If the velocity is zero for a time interval, the acceleration is zero at any instant within the time interval.
03. A boy releases a ball from the top of a building. it will clear a window 2 m high at a distance 10 m below the top in nearly
 (1) 1.3 s (2) 1 s
 (3) 0.13 s (4) 0.6 s
04. s-t graph shown in figure is a parabola. From this graph we find that

 (1) the body is moving with uniform velocity
 (2) the body is moving with uniform speed
 (3) the body is starting from rest and moving with uniform acceleration
 (4) the body is not moving at all
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. Two boys are standing at the ends A and B of a ground, where $AB = a$. The boy at B starts running in a direction perpendicular to AB with velocity v_1 . The boy at A starts running simultaneously with constant velocity v and catches the other boy in a time t , where t is :
 (1) $\frac{a}{\sqrt{v^2 + v_1^2}}$ (2) $\frac{a}{\sqrt{v^2 - v_1^2}}$
 (3) $\frac{a}{(v - v_1)}$ (4) $\frac{a}{(v + v_1)}$
07. 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
08. With respect to a rectangular cartesian co-ordinate system three vectors are expressed as $\vec{a} = 4\hat{i} - \hat{j}$, $\vec{b} = -3\hat{i} + 2\hat{j}$ and $\vec{c} = -\hat{k}$ where \hat{i} , \hat{j} , \hat{k} are unit vectors, along the x, y, z axes respectively. The unit vector along the direction of the sum of these vectors is
 (1) $\hat{r} = \frac{1}{\sqrt{3}}(\hat{i} + \hat{j} - \hat{k})$ (2) $\hat{r} = \frac{1}{\sqrt{2}}(\hat{i} + \hat{j} - \hat{k})$
 (3) $\hat{r} = \frac{1}{3}(\hat{i} - \hat{j} + \hat{k})$ (4) $\hat{r} = \frac{1}{\sqrt{3}}(\hat{i} + \hat{j} + \hat{k})$
09. The velocity of a moving point B relative to that of another point A, is obtained by compounding the real absolute velocity of point B with a velocity :
 (1) equal to that of A (2) opposite to that of A
 (3) equal and opposite to that of A
 (4) none of the above.
10. The force exerted by two charged bodies on one another obey Coulomb's law provided that
 (1) The charges are not too small
 (2) The charges are not too large
 (3) The charges are in vacuum
 (4) Linear dimensions of the bodies are much smaller than the distance between the bodies

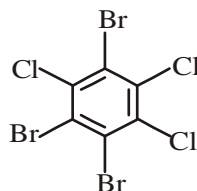
11. Select the correct statement about electric charge
 (1) Charge can be converted into energy and energy can be converted into charge
 (2) Charge of a particle increases with increase in its velocity
 (3) Charge on a body is always integral multiple of a certain charge called charge of electron
 (4) Charge on a body is always positive or zero
12. A point Q lies on the perpendicular bisector of an electrical dipole of dipole moment p. If the distance of Q from the dipole is r (much larger than the size of the dipole), then the electric field at Q is proportional to
 (1) $p^2 \& r^{-3}$ (2) $p \& r^{-2}$ (3) $p^{-1} \& r^{-2}$ (4) $p \& r^{-3}$
13. A satellite of mass m, moving around the earth in a circular orbit of radius R, has angular momentum L. The areal velocity of satellite is: (M_e = mass of earth)
 (1) $\frac{L}{2m}$ (2) $\frac{L}{2M_e}$
 (3) $\frac{2L}{m}$ (4) $\frac{2L}{M_e}$
14. If a man at equator would weight $\frac{3}{5}$ th of his weight, then angular speed of the earth is:
 (1) $\sqrt{\frac{2g}{5R}}$ (2) $\sqrt{g/R}$
 (3) $\sqrt{\frac{R}{g}}$ (4) $\sqrt{\frac{2R}{5g}}$
15. The imaginary angular velocity of the earth for which the effective acceleration due to gravity at the equator shall be zero is equal to.
 (1) $\frac{1}{8}$ rad/s (2) $\frac{1}{80}$ rad/s
 (3) $\frac{1}{800}$ rad/s (4) $\frac{1}{8000}$ rad/s
 (Take $g = 10 \text{ m/s}^2$ for the acceleration due to gravity if the earth were at rest and radius of earth equal to 6400 km.)
18. Mole fraction of A in H_2O is 0.2. The molality of A in H_2O is
 (1) 13.9 (2) 15.5
 (3) 14.5 (4) 16.8
19. In the reaction:
 $2\text{Al}_{(s)} + 6\text{HCl}_{(aq)} \longrightarrow 2\text{Al}_{(aq)}^{3+} + 6\text{Cl}_{(aq)}^{-} + 3\text{H}_{2(g)}$
 (1) 61 $\text{HCl}_{(aq)}$ is consumed for every 31 $\text{H}_{2(g)}$ produced
 (2) 33.61 $\text{H}_{2(g)}$ Base is produced regardless of temperature and pressure for every mole Al that reacts
 (3) 67.21 $\text{H}_{2(g)}$ at STP is produced for every mole Al that reacts
 (4) 11.21 $\text{H}_{2(g)}$ at STP is produced for every mole $\text{HCl}_{(aq)}$ consumed
20. Molarity of liquid HCl with density equal to 1.17 g/ml is
 (1) 36.5 (2) 18.25
 (3) 32.05 (4) 4.65
21. The correct IUPAC name of the following compound is

- (1) 3-ethyl-3-isopropyl-4-tertiarybutylhexane
 (2) 3, 4, 4-triethyl-2, 2, 5-trimethylhexane
 (3) 3, 4-diethyl-4-isopropyl-2, 2-dimethylhexane
 (4) 3, 3, 4-triethyl-2, 5, 5-trimethylhexane
22. The correct structure of compound 3, 6-diisopropyl-2, 6-dimethyloctane is

- (1) 
 (2) 
 (3) 
 (4) 
23. The correct IUPAC name of the compound


CHEMISTRY

16. The volume of a drop of water is 0.0018 mL then the number of water molecules present in two drop of water at room temperature is:
 (1) 12.046×10^{19} (2) 1.084×10^{18}
 (3) 4.84×10^{17} (4) 6.023×10^{23}
17. On analysis, a certain compound was found to contain 254 g of iodine (at. mass 127) and 80 g oxygen (at. mass 16). What is the formula of the compound?
 (1) IO (2) I_2O
 (3) I_5O_3 (4) I_2O_5

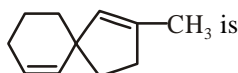
- (1) 6-Ethyl-1-methyl-4-oxohept-6-ene-1-sulphonic acid
 (2) 7-Ethyl-5-oxooct-7-ene-2-sulphonic acid
 (3) 2-Ethyl-7-sulphooct-1-ene-4-one
 (4) 7-Methylene-5-oxononane-2-sulphonic acid

24. What is the correct IUPAC name of the compound given below?



- (1) 1, 3, 4-tribromo-2, 5, 6-trichlorobenzene
 (2) 3, 5, 6-tribromo-1, 2, 4-trichlorobenzene
 (3) 3, 4, 6-tribromo-1, 2, 5-trichlorobenzene
 (4) 1, 2, 4-tribromo-3, 5, 6-trichlorobenzene

25. The IUPAC name of the spiro compound,



- (1) 8-Methylspiro [4.5] deca-1, 7-diene
 (2) 3-Methylspiro [5.4] deca-3, 7-diene
 (3) 2-Methylspiro [5.4] deca-1, 6-diene
 (4) 2-Methylspiro [4.5] deca-1, 6-diene

26. An element X have electronic configuration $[Rn] 6d^2 7s^2$ placed in :

- (1) s-block (2) p-block
 (3) d-block (4) f-block

27. The first (ΔH_1) and the second (ΔH_2) ionisation enthalpy in $KJ\ mole^{-1}$ and the (ΔH_{eg}) electron gain enthalpy in $KJ\ mole^{-1}$ of few elements are given below

Elements	ΔH_1	ΔH_2	ΔH_{eg}
A	520	7300	-60
B	419	3051	-48
C	738	1451	-40
D	2372	5251	+48

Determine the correct matching between column I & II

Column-I	Column- II
A	- p-least reactive non metal
B	- q-most reactive metal
C	- r-metal form MX type covalent halide
D	- s- Metal form MX_2 type halide

- (1) A - r, B - q, C - s, D - p
 (2) A - p, B - q, C - r, D - s
 (3) A - q, B - r, C - s, D - p
 (4) A - r, B - q, C - p, D - s

28. Energy of an electron in ground state of hydrogen atom is $-2.18 \times 10^{-18} J$ its ionisation enthalpy in $J\ mole^{-1}$ is

- (1) $3.6 \times 10^6 J\ mole^{-1}$ (2) $1.31 \times 10^6 J\ mole^{-1}$
 (3) $2.7 \times 10^6 J\ mole^{-1}$ (4) None of these

29. The atomic number of the element present in 5th period of group 16 :

- (1) 52 (2) 84 (3) 34 (4) 16

30. Match the column -I and column-II

Column-I	Column-II
A-Element with five 'e' in outermost shell	p. Fe, Co, Ni
B-Element tends to loose two electron	q. O, S, Se
C-Element tends to gain two electron	r. As, Sb, Bi
D-Element that have two shells incomplete	s. Ca, Sr, Ba

- (1) A-r, B- s, C - p, D - q (2) A - r, B - s, C - q, D - p
 (3) A-p, B- q, C - s, D - r (4) A - q, B - r, C - s, D - p

BOTANY

31. The diffusion of any substance across a membrane does not depend on

- (1) Solubility in lipids
 (2) Concentration gradient
 (3) Input of energy
 (4) Both (1) and (2)

32. Read the following statements and find out the incorrect statements.

- (A) Water is essential for all physiological activities of the plant and Plays a very important role in all living organisms.
 (B) A mature corn plant absorbs almost five litres of water in a day
 (C) A mustard plant absorbs water equal to its own weight in about 3 hours.
 (D) Water is often the limiting factor for plant growth and productivity in both agricultural and natural environments.

(E) A watermelon has over 92 percent water, most herbaceous plants have only about 10 to 20 percent of its fresh weight as dry matter.

- (1) B, C, E (2) A, B, D
 (3) A, C, E (4) B, C, D

33. On a day, when there is plenty of atmospheric moisture, a small soft-stemmed plant cut horizontally near the base with a sharp blade early in the morning. Some drops of solution ooze out of the cut stem, this comes out due to the

- (1) Transpiration pull
 (2) Positive root pressure
 (3) negative root pressure
 (4) Negative hydrostatic pressure gradient

34. Stomatal opening is under the control of
 (1) Epidermal cells
 (2) Palisade cells
 (3) Spongy parenchyma cells
 (4) Guard cells
35. The process of plasmolysis is usually
 (1) Reversible (2) Irreversible
 (3) Active (4) both (1) and (3)
36. 0.1 M solution of solute (non-electrolyte) will have a water potential of
 (1) -2.3 bars
 (2) Zero
 (3) 2.3 bars
 (4) 22.4 bars
37. Path of water movement from soil to xylem is
 (1) Metaxylem → Protoxylem → Cortex → Soil → Root hair
 (2) Cortex → Root hair → Endodermis → Pericycle → Protoxylem → Metaxylem
 (3) Soil → Root hair → Cortex → Endodermis → Pericycle → Protoxylem → Metaxylem
 (4) Pericycle → Soil → Root hair → Cortex → Endodermis → Protoxylem → Metaxylem
38. How many of the following organelles are found in prokaryotic cells?
 ER, Golgi complex, Lysosome, Mitochondria, Microbodies, Vacuoles
 (1) One (2) Three
 (3) Four (4) Zero
39. Which of the following pairs is mismatched?
 (1) Glycocalyx – May be capsule or slime layer
 (2) Pili – Reproduction
 (3) Cell wall – Protective, determines shape, prevents from bursting
 (4) Flagella, pili and fimbriae – Surface structures of bacterial cell
40. Which of the following is an example of active transport performed by the cell membrane?
 (1) Diffusion
 (2) Na⁺/K⁺ pump
 (3) Osmosis
 (4) Both (1) and (3)
41. How many of the following organelles are found both in animal and plant cells?
 Mitochondria, Plastids, Golgi complex, Ribosomes, Lysosomes, Centrioles, Vacuoles, Plasmids
 (1) Three (2) Four
 (3) Five (4) Six

42. In ribosomes 'S' means
 (1) Svedberg's unit
 (2) sedimentation coefficient
 (3) molecular weight
 (4) Both (1) and (2)
43. Which of the following is not the function of centrioles?
 (1) It forms the basal body of cilia
 (2) It helps in the formation of spindle fibres during cell division
 (3) Osmoregulation
 (4) Both (1) and (2)
44. The cells which are actively carrying out protein synthesis contains _____ and _____ nucleoli.
 (1) larger; more (2) larger; less
 (3) smaller; more (4) smaller; less
45. Match Column-I with Column-II and select the correct option.

	Column-I		Column-II
(a)	Lysosomes	(i)	Protein synthesis
(b)	Ribosomes	(ii)	Hydrolytic activity
(c)	Smooth endoplasmic reticulum	(iii)	Steroid synthesis
(d)	Centriole	(iv)	Formation of spindle

- (1) (a)-(ii); (b)-(i); (c)-(iii); (d)-(iv)
 (2) (a)-(i); (b)-(iii); (c)-(iv); (d)-(ii)
 (3) (a)-(i); (b)-(iv); (c)-(iii); (d)-(ii)
 (4) (a)-(ii); (b)-(i); (c)-(iv); (d)-(iii)

ZOOLOGY

46. Normal glucose level of blood is
 (1) 10 gm/litre (1%)
 (2) 1 gm/litre (0.1%)
 (3) 100 gm/litre (10%)
 (4) 0.1 gm/litre (0.01%)
47. Which one contains minimum urea
 (1) hepatic portal vein (2) Hepatic vein
 (3) Renal vein (4) Dorsal aorta
48. Which one is present in tunica media
 (1) Collagen fibres and smooth muscles
 (2) Yellow fibres and smooth muscles
 (3) yellow fibres and striated muscles
 (4) Squamous epithelium and striated muscles
49. To obtain a standard ECG, a patient is connected to the machine by three electrodes
 (1) One to each wrist and to the left ankle
 (2) One to each ankle and to the left wrist
 (3) One to each wrist and to the left wrist region
 (4) One to each ankle and to the left chest region.

50. Blood pressure in the mammalian aorta is maximum during
 (1) Systole of the left ventricle
 (2) Diastole of the right atrium
 (3) Systole of the left atrium
 (4) Diastole of the right ventricle

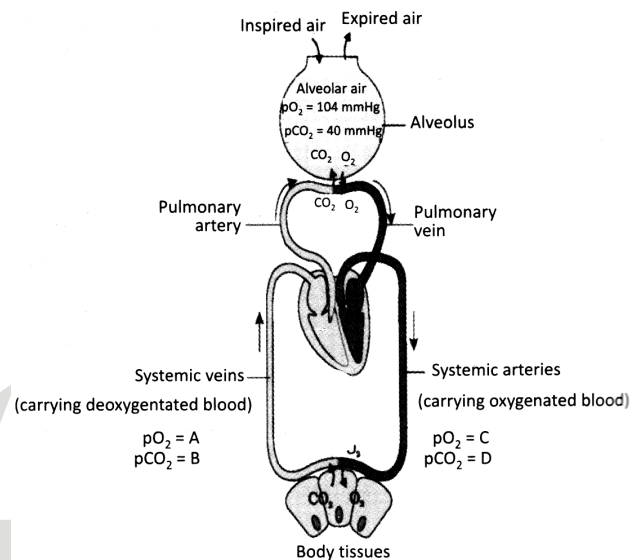
51. Match the Column-I with Column-II

Column-I		Column-II	
(A)	P-wave	(i)	Depolarisation of ventricles
(B)	QRS complex	(ii)	Repolarisation of ventricles
(C)	T-wave	(iii)	coronary ischemia
(D)	Reduction in the size of T-wave	(iv)	Depolarisation of atria
		(v)	Repolarisation of atria

Select the correct option :

- (1) A-iv, B-i, C-ii, D-v
 (2) A-ii, B-i, C-v, D-iii
 (3) A-ii, B-iii, C-v, D-iv
 (4) A-iv, B-i, C-ii, D-iii
52. The hepatic portal vein drains blood to liver from
 (1) Heart
 (2) Stomach
 (3) Kidneys
 (4) Intestine
53. Which of the following sets of organisms doesn't possess similar respiratory organs ?
 (1) Coelenterates and flatworms
 (2) Aquatic arthropods and molluscs
 (3) Reptiles and mammals
 (4) Earthworms and Insects
54. Expiration is result of :
 (1) Contraction of internal intercostal muscles
 (2) Relaxation of internal intercostal muscles and diaphragm
 (3) Contraction of external intercostal muscles and relaxation of diaphragm
 (4) Relaxation of external intercostal muscles and diaphragm
55. Amount of O₂ and CO₂ delivered by 100 ml oxygenated blood to tissues and 100 ml deoxygenated blood to alveoli is respectively :
 (1) 10 ml, 4 ml (2) 5 ml, 8 ml
 (3) 5 ml, 4 ml (4) 1 ml, 5 ml
56. Receptors in wall of arch of aorta and carotid artery are mainly sensitive for :
 (1) O₂ and CO₂ (2) Temperature and H⁺
 (3) CO₂ and H⁺ (4) CO₂ and temperature

57. Pleural fluid is located :
 (1) In the alveoli
 (2) Outer to outer pleural membrane
 (3) Inner to inner pleural membrane
 (4) Outer to inner pleural membrane
58. Maximum volume of air that a person can expire after a forced inspiration :
 (1) Total lung capacity (2) Vital capacity
 (3) Inspiratory capacity (4) Expiratory capacity
59. Correct values of A-D are :



	A	B	C	D
(1)	40 mm Hg	45 mm Hg	95 mm Hg	40 mm Hg
(2)	45 mm Hg	40 mm Hg	95 mm Hg	40 mm Hg
(3)	40 mm Hg	45 mm Hg	90 mm Hg	95 mm Hg
(4)	45 mm Hg	40 mm Hg	40 mm Hg	95 mm Hg

60. If pCO₂ is high and pO₂ is low :
 (1) More carbamino-haemoglobin is formed
 (2) More carboxy-haemoglobin is formed
 (3) More oxy-haemoglobin is formed
 (4) More and more release of CO₂ occurs