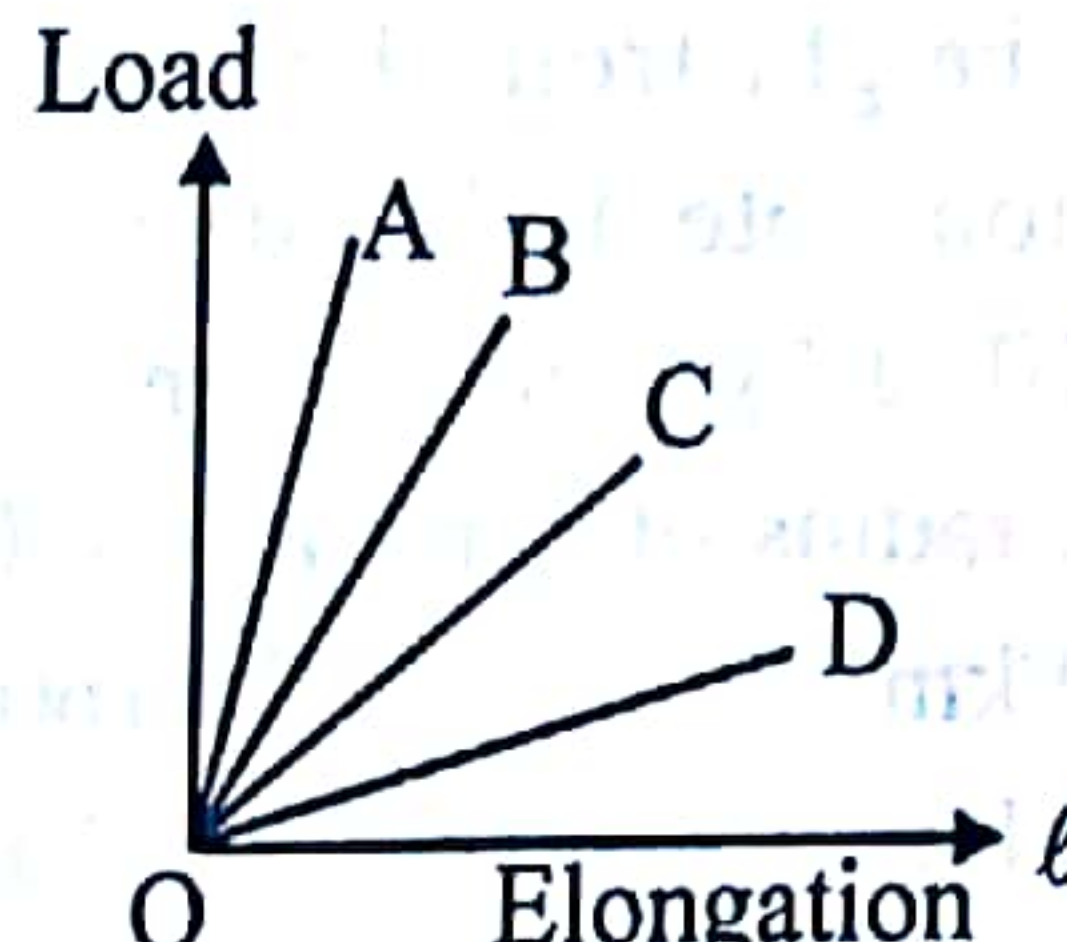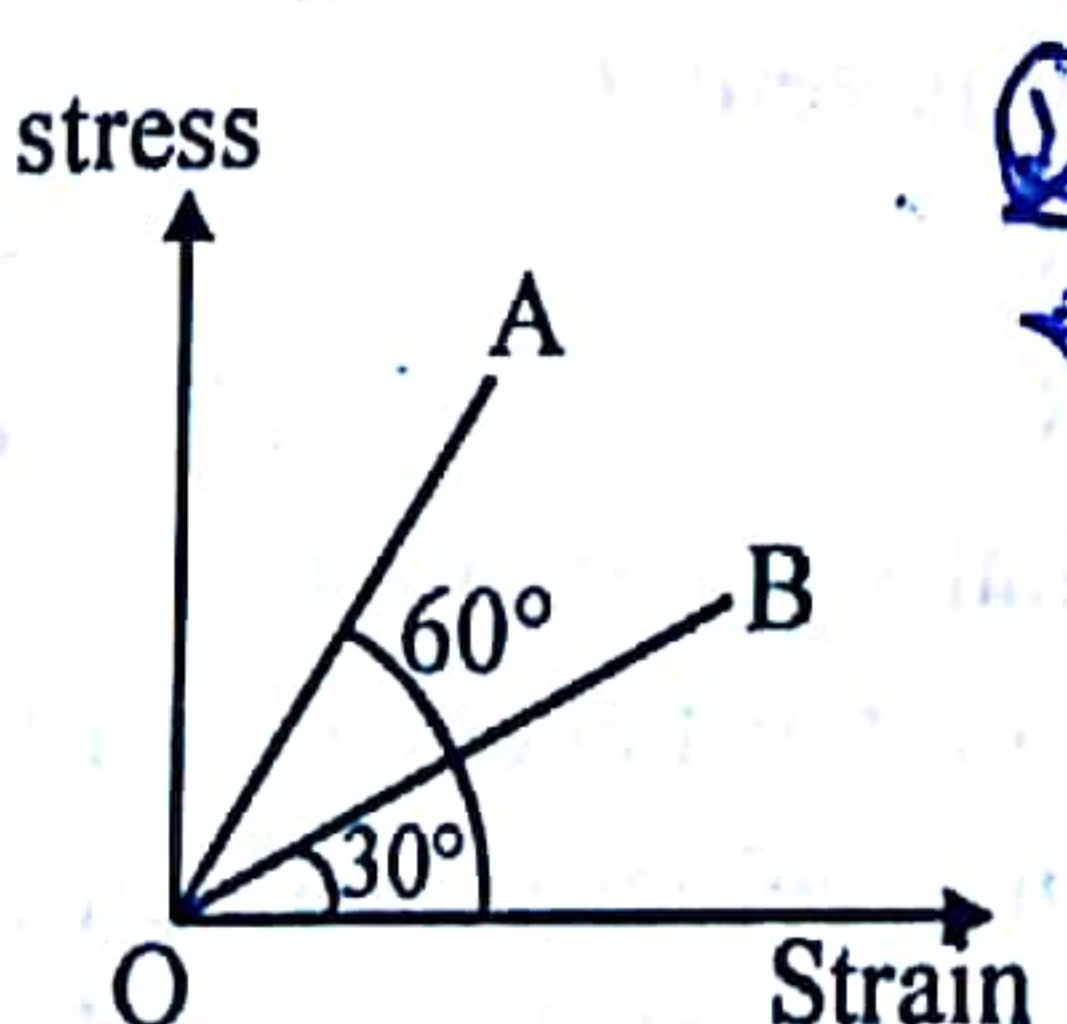HAVE CONTROL ⟶ HAVE PATIENCE ⟶ HAVE CONFIDENCE ⇒ 100% SUCCESS

(BEWARE OF NEGATIVE MARKING)

TOPIC : Rotation (Torque, Angular Momantum, Rolling) Elasticity, Kinematics & Gravitation, SHM (Till equation of SHM)

1. Young's modulus of the material of a wire of length 'L' and radius 'r' in 'Y' N/m². If the length in reduced to L/2 and radius to r/2, the young modulus will be :-
   (1) Y
   (2) 2Y
   (3) Y/4
   (4) Y/2

2. The young's Modulus of a wire in numerically equal to the stress which will :-
   (1) not change the length of the wire
   (2) double the length of the wire
   (3) increase the length by 50%
   (4) change the radius of the wire to half

3. The interatomic distance for a metal is 3×10^{-10}m. If the interatomic force constant is 3.6×10^{-9}N/Å then the young's modulus in N/m² will be :-
   (1) 1.2×10^{11}
   (2) 4.2×10^{11}
   (3) 10.8×10^{8}
   (4) 2.4×10^{10}

4. The load versus elongation graph for four wires of the same material is shown in the figure. The thickest wire is represented by the line :-

   (1) OD
   (2) OC
   (3) OB
   (4) OA

5. The stress versus strain graphs for wires of two materials A and B are as shown in the figure. If Y_A and Y_B are the Young's modulus of the materials then :-

   (1) $Y_B = 2Y_A$
   (2) $Y_A = Y_B$
   (3) $Y_B = 3Y_A$
   (4) $Y_A = 3Y_B$

6. An elevator cable's maximum stress is 1×10^{7}N/m². Its maximum upward acceleration is 1.2m/s². If the cable has to support the total weight of 2000kg of a loaded elevator, the area of cross-section of the cable should be [Take g = 9.8 m/s²]
   (1) 3.22 cm²
   (2) 2 cm²
   (3) 0.32 cm²
   (4) 5 cm²

7. Young modulus of elasticity of brass is 10^{11} N/m². The increase in its energy on pressing a rod of length 0.1 m and cross-sectional area 1 cm² made of brass with a force of 10 kg along its length, will be ....
   (1) 4.8×10^{-5} J
   (2) 5.4×10^{-8} J
   (3) 4.8×10^{-6} J
   (4) 3×10^{-5} J

8. The diameter of a brass rod is 4 mm and Young's modulus of brass is 9×10^{10} N/m². The force required to stretch by 0.1% of its length is :
   (1) $360\,\pi$ N
   (2) 36 N
   (3) $144\,\pi \times 10^{3}$ N
   (4) $36\,\pi \times 10^{5}$ N

9. The approximate depth of an ocean is 2700 m. The compressibility of water is 45.4×10^{-11} Pa⁻¹ and density of water is 10^{3} kg/m³. What fractional compression of water will be obtained at the bottom of the ocean ?
   (1) 1.0×10^{-2}
   (2) 1.2×10^{-2}
   (3) 1.4×10^{-2}
   (4) 0.8×10^{-2}

10. Two wires are made of the same material and have the same volume. However wire 1 has cross-sectional area A and wire 2 has cross-sectional area 3A. If the length of wire 1 increases by Δx on applying force F, how much force is needed to stretch wire 2 by the same amount ?
    (1) 6F
    (2) 9F
    (3) F
    (4) 4F

11. A thin circular ring of mass M and radius R is rotating about its axis with a constant angular velocity ω. Two objects of mass 'm' are attached gently to the ring. The wheel now rotates with an angular velocity. :-
    (1) $\dfrac{\omega M}{(m+M)}$
    (2) $\dfrac{\omega(M-2m)}{(M+2m)}$
    (3) $\dfrac{\omega M}{(M+2m)}$
    (4) $\dfrac{\omega(M+2m)}{M}$

12. A particle of mass 5g is moving with a uniform speed of $3\sqrt{2}$ cm/s in the x–y plane along the line $y= 2\sqrt{5}$ cm. The magnitude of its angular momentum about the origin in g-cm²/s is :-
   (1) zero
    (2) 30
    (3) $30\sqrt{2}$
    (4) $30\sqrt{10}$

13. The speed of a uniform spherical shell after rolling down an inclined plane of vertical height 'h' from rest is :-
    (1) $\sqrt{\dfrac{10gh}{7}}$
    (2) $\sqrt{\dfrac{6gh}{5}}$
    (3) $\sqrt{\dfrac{4gh}{5}}$
    (4) $\sqrt{2gh}$

14. A small pulley of radius 20 cm and moment of inertia 0.32 kg-m² is used to hang a 2kg mass with the help of massless string. If the block is released, for no slipping condition acceleration of the block will be :-
    (1) 2 m/s²
    (2) 4 m/s²
    (3) 1 m/s²
    (4) 3 m/s²
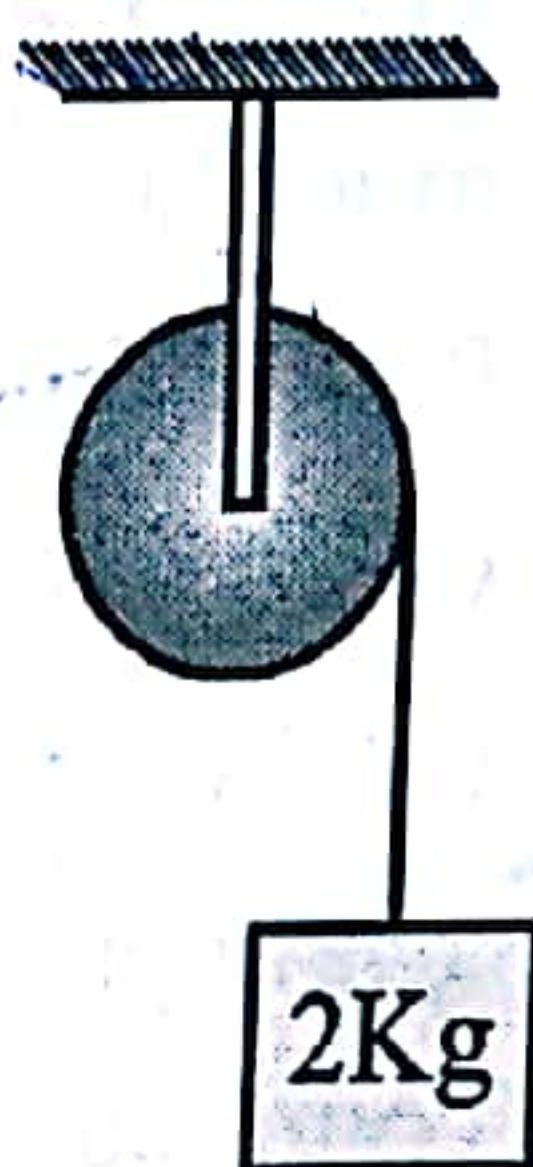
15. A solid sphere of mass m and radius R is rotating about its diameter. A solid cylinder of the same mass and same radius is also rotating about its geometrical axis with an angular speed twice that of the sphere. The ratio of their kinetic energies of rotation ($E_{sphere}/E_{cylinder}$) will be :-
   (1) 1 : 4
    (2) 3 : 1
    (3) 2 : 3
    (4) 1 : 5

16. A particle of mass m is projected with a velocity v making an angle 45° with the horizontal. The magnitude of the angular momentum of the projectile about the point of projection when the particle is at its maximum height h, is :
    (1) zero
    (2) $\dfrac{mv^3}{4\sqrt{2}g}$
    (3) $\dfrac{mv^3}{\sqrt{2g}}$
    (4) $m^2\sqrt{2gh^3}$

17. If torque on a body is zero, then which is conserved:
    (1) force
    (2) linear momentum
    (3) angular momentum
    (4) angular impulse
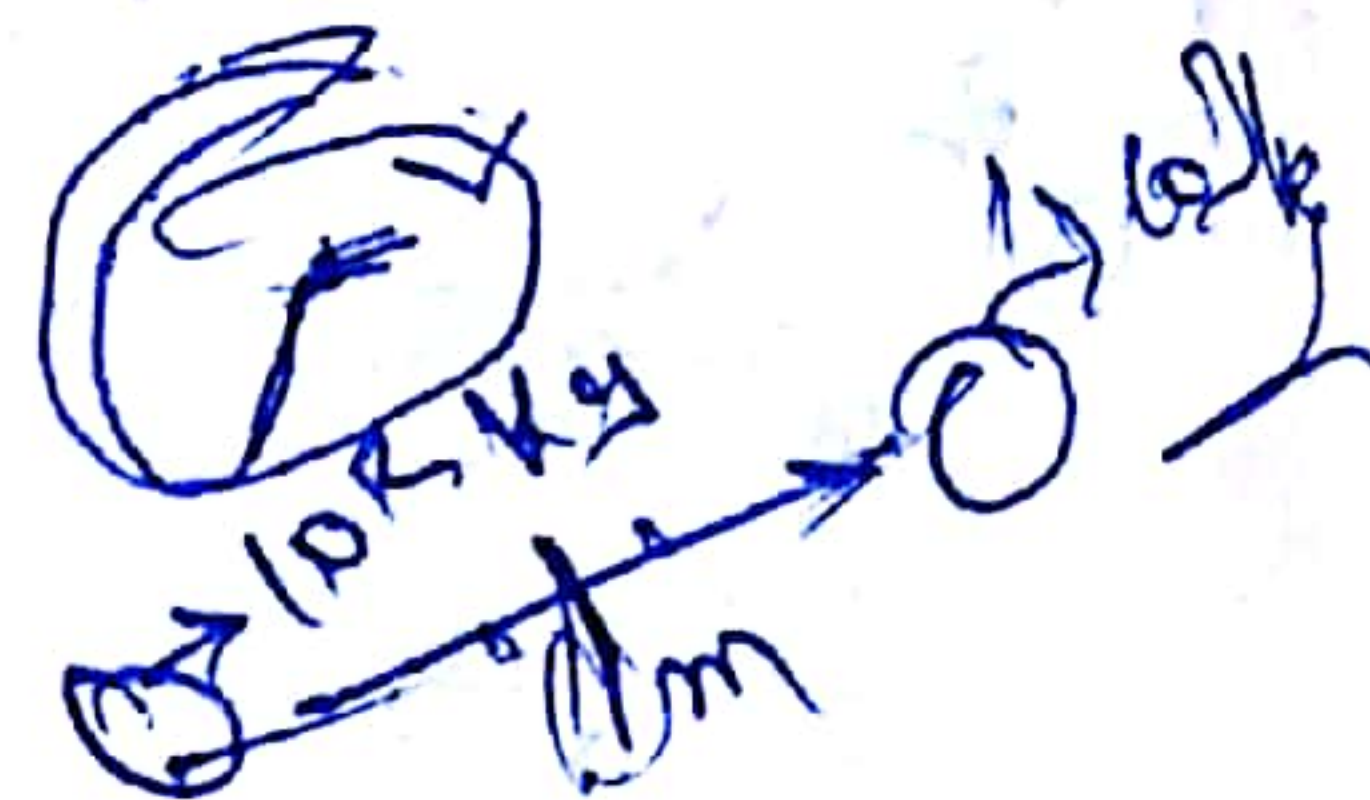
18. Two masses of 10² kg and 10³ kg are separated by 1 m distance. Find the gravitational potential at the mid point of the line joining them.
    (1) – 2200 G
    (2) – 1100 G
    (3) – 2500 G
    (4) – 100 G

19. A particle of mass M is situated at the centre of a spherical shell of same mass and radius a. The gravitational potential at a point situated at $\dfrac{a}{2}$ distance from the centre, will be :-
    (1) $-\dfrac{4GM}{a}$
    (2) $-\dfrac{3GM}{a}$
    (3) $-\dfrac{2GM}{a}$
    (4) $-\dfrac{GM}{a}$

20. The height at which the weight of a body becomes 1/16th, its weight on the surface of earth (radius R), is :-
    (1) 3R
    (2) 4R
    (3) 5R
    (4) 15R

21. At what height from the surface of earth the gravitation potential and the value of g are -5.4×10^7 J/kg² and 6.0 m/s² respectively ? Take the radius of earth as 6400 km :
    (1) 2600 km
    (2) 1600 km
    (3) 1400 km
    (4) 2000 km

22. Two solid spherical planets of equal radii R having masses 4M and 9M their centre are separated by a distance 6R. A projectile of mass m is sent from the planet of mass 4 M towards the heavier planet. What is the distance r of the point from the lighter planet where the gravitational force on the projectile is zero ?
    (1) 1.4 R
    (2) 1.8 R
    (3) 1.5 R
    (4) 2.4 R

23. The orbital velocity of an artificial satellite in a circular orbit just above the earth's surface is v_0. The orbital velocity of satellite orbiting at an altitude of half of the radius is :-
    (1) $\dfrac{3}{2}v_0$
    (2) $\dfrac{2}{3}v_0$
    (3) $\sqrt{\dfrac{2}{3}}v_0$
    (4) $\sqrt{\dfrac{3}{2}}v_0$

24. The mean distance of mars from sun is 1.5 times that of earth from sun. What is approximately the number of years required by mars to make one revolution about sun ?

(1) 2.35 years   (2) 1.85 years

(3) 3.65 years   (4) 2.75 years

25. Near the earth's surface time period of a satellite is 1.4 hrs. Find its time period if it is at the distance '4R' from the centre of earth :-

(1) 32 hrs.   (2) $\left(\dfrac{1}{8\sqrt{2}}\right)$ hrs.

(3) $8\sqrt{2}$ hrs.   (4) 16 hrs.

26. A body attains a height equal to the radius of the earth when projected from earth' surface. The velocity of the body with which it was projected is :

(1) $\sqrt{\dfrac{GM}{R}}$ (2) $\sqrt{\dfrac{2GM}{R}}$

(3) $\sqrt{\dfrac{5}{4}\dfrac{GM}{R}}$ (4) $\sqrt{\dfrac{3GM}{R}}$

27. Imagine a new planet having the same density as that of earth but it is 3 times bigger than the earth in size. If the acceleration due to gravity on the surface of earth is g and that on the surface of the new planet is g', then :

(1) g' = 3g   (2) g' = g/9

(3) g' = 9g   (4) g'=27 g

28. The height at which the acceleration due to gravity decreases by 36% of its value on the surface of the earth is: (Assume radius of the earth is R) :-

(1) $\dfrac{R}{4}$ (2) $\dfrac{R}{2}$

(3) $\dfrac{R}{6}$ (4) 4 R

29. Two bodies of masses m and 4m are placed at a distance r. The gravitational potential at a point on the line joining them where the gravitational field is zero is :-

(1) $-\dfrac{6Gm}{r}$ (2) $-\dfrac{9Gm}{r}$

(3) zero   (4) $-\dfrac{4Gm}{r}$

30. A thin rod of length L is bent to form a semicircle. The mass of rod is M. What will be the gravitational potential at the centre of the circle?

(1) $-\dfrac{GM}{L}$ (2) $-\dfrac{GM}{2\pi L}$

(3) $-\dfrac{\pi GM}{2L}$ (4) $-\dfrac{\pi GM}{L}$

31. Two satellites A and B go around a planet P in circular orbits having radius 4R and R respectively. If the speed of satellite A is 3 v, then the speed of satellite B will be :-

(1) 5 v   (2) 9 v

(3) 6 v   (4) none of these

32. A particle moves along a straight line OX. At a time t (in seconds) the distance x (in metres) of the particle from O is given by $x = 40 + 12t - t^3$. How long would the particle travel before coming to rest ?

(1) 24 m   (2) 40 m

(3) 56 m   (4) 16 m

33. The distance travelled by a particle starting from rest and moving with an acceleration $\dfrac{4}{3}$ m/s², in the third second is :-

(1) $\dfrac{10}{3}$ m   (2) $\dfrac{19}{3}$ m

(3) 6m   (4) 4m

34. A bus is moving with a speed of 10 m/s on a straight road. A scooterist wishes to overtake the bus in 100 s. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus ?

(1) 10 m/s   (2) 20 m/s

(3) 40 m/s   (4) 25 m/s

35. 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) 5 units   (2) 9 units

(3) $9\sqrt{2}$ units   (4) $5\sqrt{2}$ units

36. A ship A is moving Westwards with a speed of 10 km/h and a ship B 100 km South of A, is moving Northwards with a speed of 10 km/h. The time after which the distance between them becomes shortest, is :-

(1) 5 h   (2) $5\sqrt{2}$ h   (3) $10\sqrt{2}$ h   (4) 0 h

37. If the velocity of a particle is $v = At + Bt^2$, where A and B are constants, then the distance travelled by it between 1s and 2s is :-

(1) $\frac{3}{2}A + 4B$

(2) $3A + 7B$

(3) $\frac{3}{2}A + \frac{7}{3}B$

(4) $\frac{A}{2} + \frac{B}{3}$

38. A man wishes to swim across a river 0.5 km wide. If he can swim at the rate of 2 km/h in still water and the river flows at the rate of 1 km/h. The angle made by the directon (w.r.t. the flow of the river) along which he should swim so as to reach a point exactly opposite his starting point, should be :

(1) 60°

(2) 120°

(3) 145°

(4) 90°

39. A river 2 km wide is flows at the rate of 2km/h. A boatman who can row a boat at a speed of 4 km/h in still water, goes a distance of 2 km upstream and then comes back. The time taken by him to complete his journey is

(1) 60 min

(2) 70 min

(3) 80 min

(4) 90 min

40. Two particles are separated by a horizontal distance x as shown in figure. They are projected as shown in figure with different initial speeds. The time after which the horizontal distance between them becomes zero is :
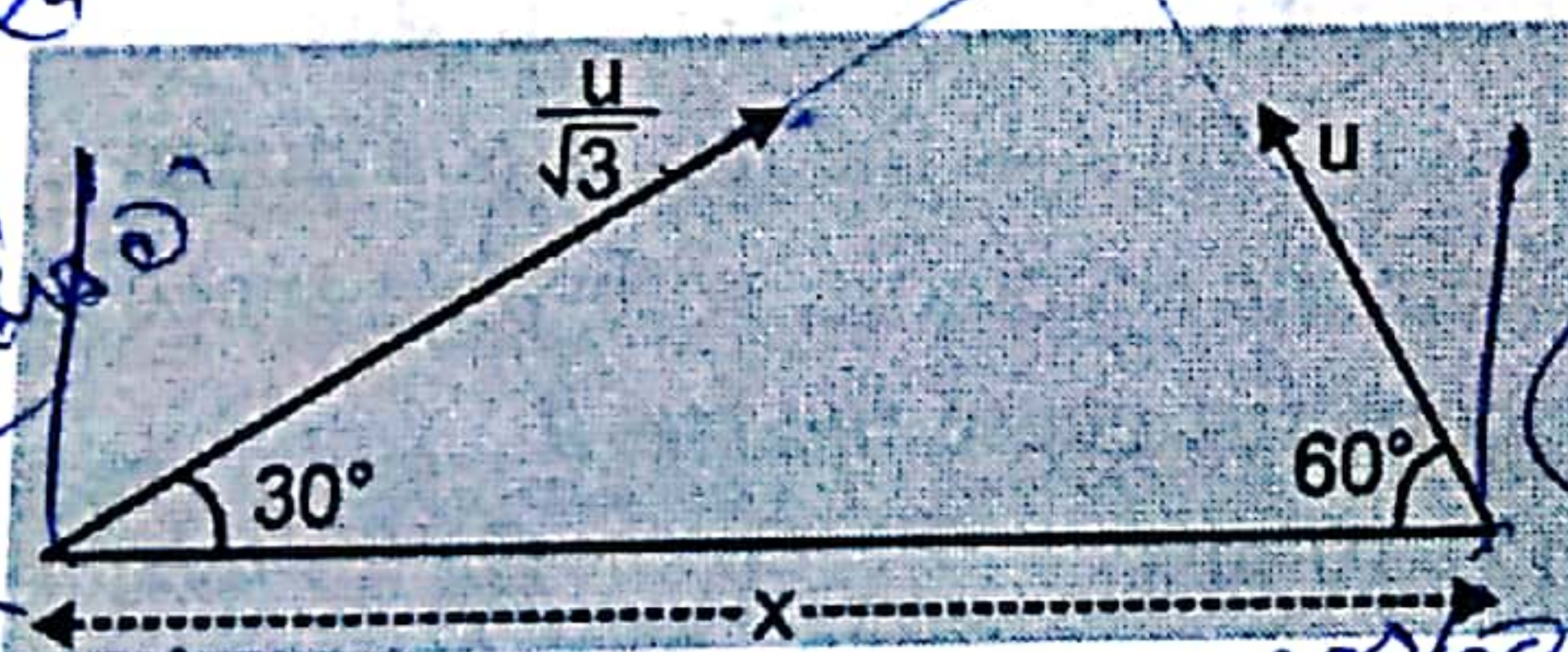
(1) $\frac{x}{u}$

(2) $\frac{u}{2x}$

(3) $\frac{2u}{x}$

(4) none of these

41. A stone is dropped from a certain height which can reach the ground in 5 seconds. It is stopped after 3 seconds of its fall and is again released. The total time taken by the stone to reach the ground will be :

(1) 6 s

(2) 6.5 s

(3) 7 s

(4) 7.5 s

42. A particle is fastened at the end of a string and whirled in a vertical circle with the other end of the string being fixed. The motion of the particle is :-
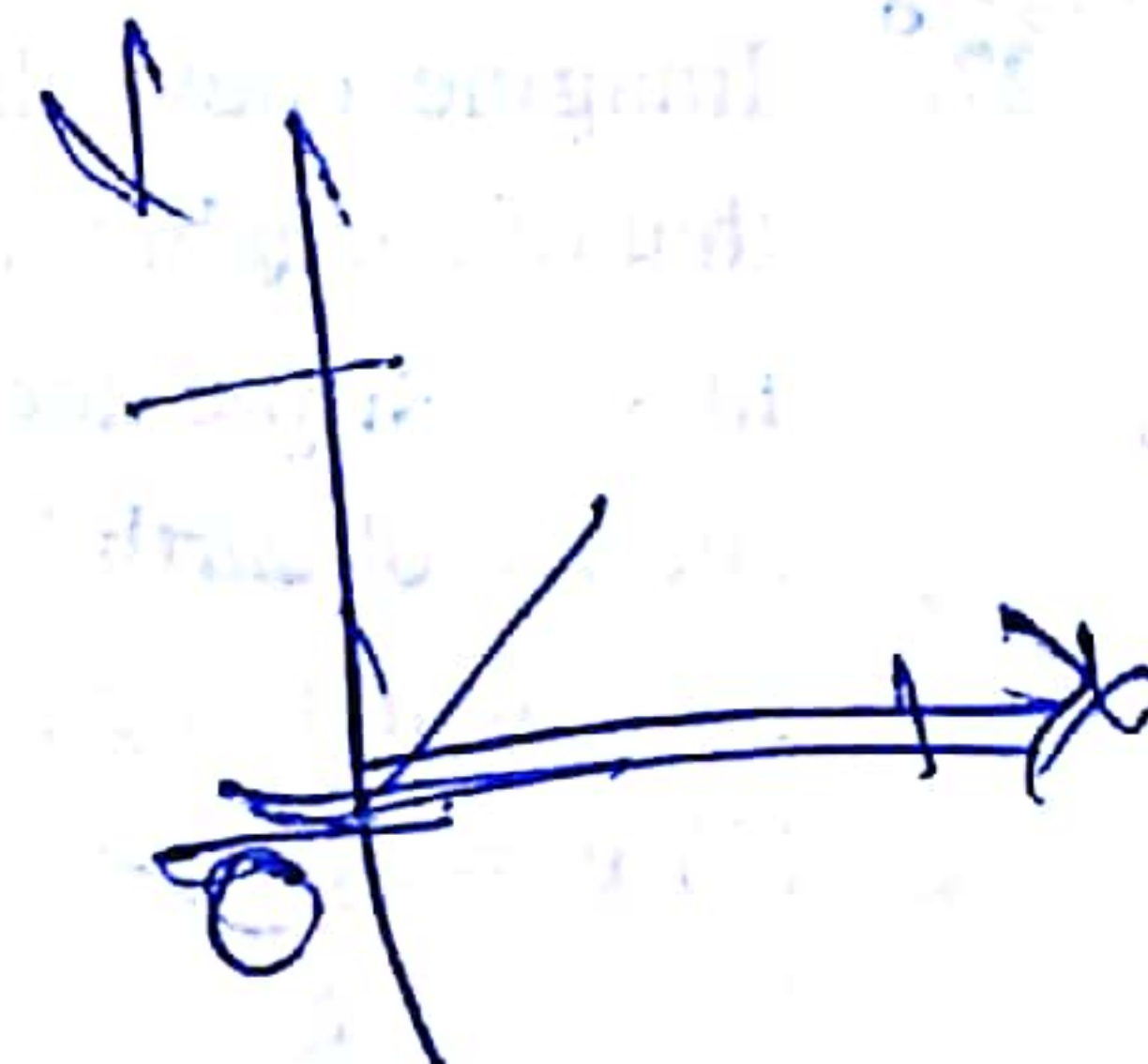
(1) Periodic

(2) Oscillatory

(3) Simple Harmonic

(4) None of these

43. Which of the following expression does not represent SHM ?

(1) $A\cos\omega t$

(2) $A\sin2\omega t$

(3) $A\sin\omega t + B\cos\omega t$

(4) $A\sin^3\omega t$

44. The differential equation of a particle executing simple harmonic motion along y-axis is :-

(1) $\frac{d^2y}{dt^2} + \omega^2 y = 0$

(2) $\frac{d^2y}{dt^2} + \omega^2 y^2 = 0$

(3) $\frac{d^2y}{dt^2} - \omega^2 y = 0$

(4) $\frac{dy}{dt} + \omega y = 0$
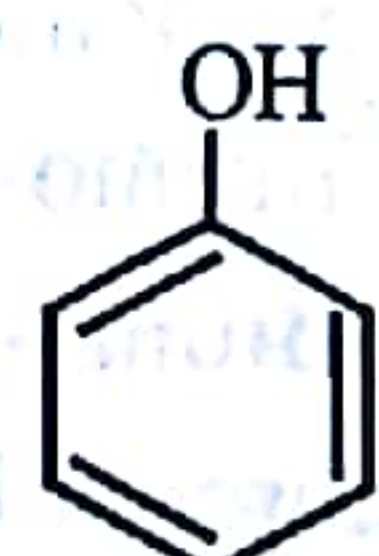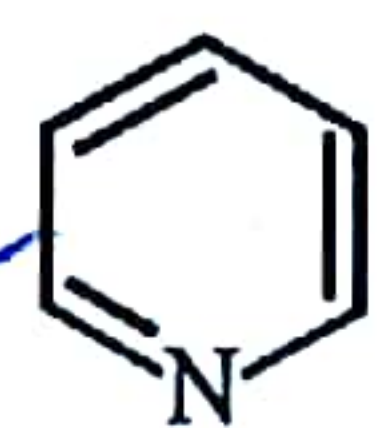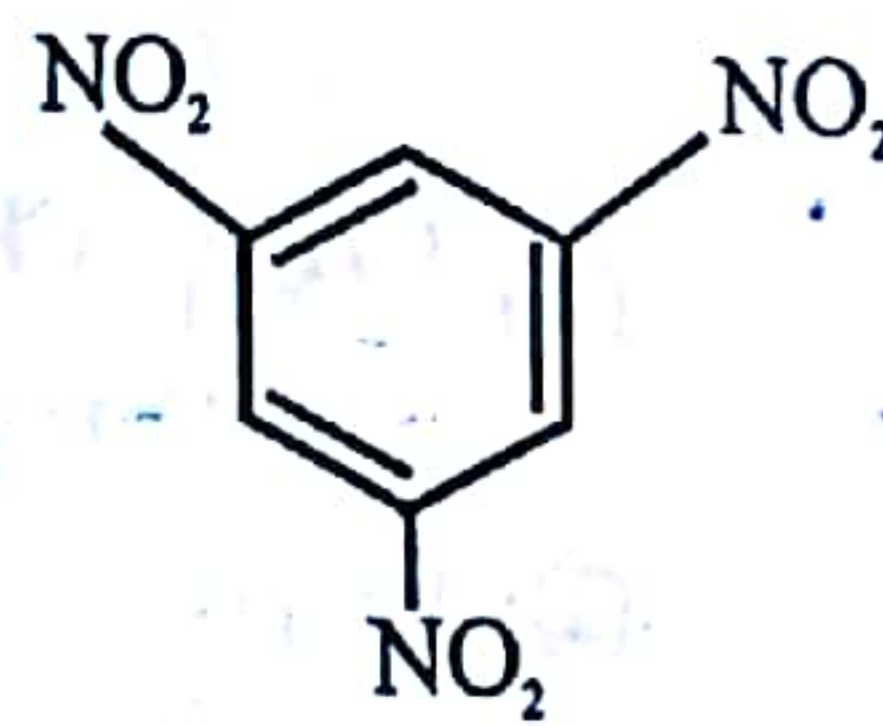
45. A particle executing simple harmonic motion along y-axis has its motion described by the equation-

$$y = A\sin\omega t + B$$

The amplitude of the simple harmonic motion is :-

(1) A

(2) B

(3) A + B

(4) $\sqrt{A + B}$

Topic : Thermodynamic, Introduction of OC, Classification, nomanclature upto open chain compound, Polyfunctional Group Compound, Dipole Moment, H-bonding, Weak forces, MOT, Ionic Bond

46. The work done by a weightless piston in causing an expansion ΔV (at constant temperature), when the opposing pressure P is variable, is given by :

   (1) $W = -\int PdV$ (2) $W = 0$

   (3) $W = -P\Delta V$ (4) None

47. The heat of combustion of ethanol determined in a bomb calorimeter is $- 670.48$ K. Cals mole^{-1} at $25°C$. What is ΔH at $25°C$ for the reaction :-

   (1) $- 335.24$ K. Cals. (2) $- 671.08$ K. Cals.
   (3) $- 670.48$ K Cals. (4) $+ 670.48$ K. Cals.

48. Calculate enthalpy of vapourization per mole of ethanol. Given $\Delta S = 109.8$ JK^{-1} mol^{-1} and B.pt. of ethanol is $78.5°C$.

   (1) Zero
   (2) 38.594 KJ mol^{-1}
   (3) 3.85 KJ mol^{-1}
   (4) Some more data is required

49. If $\Delta H > 0$ and $\Delta S > 0$, the reaction proceeds spontaneously when :-

   (1) $\Delta H > 0$ (2) $\Delta H < T\Delta S$
   (3) $\Delta H = T\Delta S$ (4) None

50. Using the Gibbs energy change, $\Delta G° = + 63.3$kJ, for the following reaction,

   $$Ag_2CO_3 \rightleftharpoons 2A\overset{+}{g} (aq) + CO_3^{2-} (aq)$$
   the K_{sp} of $Ag_2CO_3(s)$ in water at $25°C$ is :-
   $(R = 8.314$ J K^{-1} mol$^{-1})$

   (1) 3.2×10^{-26} (2) 8.0×10^{-12}
   (3) 2.9×10^{-3} (4) 7.9×10^{-2}

51. For a reversible process at T = 300K, the volume of an ideal gas is increased from $V_i = 1L$ to $V_f = 10L$. Calculate ΔH if the process is isothermal :-

   (1) 11.47 kJ (2) 4.98 kJ
   (3) 0 (4) -11.47 kJ

52. In conversion of lime-stone to lime,

   $$CaCO_3(s) \longrightarrow CaO(s) + CO_2(g)$$
   the values of $\Delta H°$ and $\Delta S°$ are $+179.1$ kJ mol^{-1} and 160.2 J/K respectively at 298 K and 1 bar. Assuming that $\Delta H°$ and $\Delta S°$ do not change with temperature, temperature above which conversion of limestone to lime will be spontaneous is :-

   (1) 1008 K (2) 1200 K
   (3) 845 K (4) 1118 K

53. For the gaseous reaction involving the complete combustion of isobutane -

   (1) $\Delta H = \Delta E$ (2) $\Delta H > \Delta E$
   (3) $\Delta H = \Delta E = 0$ (4) $\Delta H < \Delta E$

54. Two litre of N_2 at $0°C$ and 5 atm are expanded isothermally against a constant external pressure of 1 atm until the pressure of gas reaches 1 atm. Assuming the gas to be ideal calculate work of expansion ?

   (1) -504.2 joule (2) -405.2 joule
   (3) $+810.4$ joule (4) -810.4 joule

55. For the reaction

   $$C_3H_{8(g)} + 5O_{2(g)} \rightarrow 3CO_{2(g)} + 4H_2O_{(l)}$$
   at constant temperature $\Delta H - \Delta U$

   (1) $-RT$ (2) $+RT$ (3) $-3RT$ (4) 3RT

56. The number of σ and π-bonds in Butenyne is :-

   (1) 7, 3 (2) 9, 4 (3) 5, 4 (4) 9, 2

57. Common name of the given compound is :-

   $$CH_3-\underset{\underset{O}{\|}}{C}-O-CH=CH_2$$

   (1) Vinyl ethanoate (2) Vinyl acetate
   (3) Methyl acrylate (4) acryl acetate

58. Which of following is an example of Heterocyclic compound :-

59. The number of carbon atoms in third member of ester homologous series :-

   (1) 2 (2) 1 (3) 4 (4) 3

60. The IUPAC name of given compound is :-

   $$CH_3-CH_2-\underset{\underset{CH_3}{\overset{|}{\underset{|}{CH_2}}}}{\overset{|}{CH}}-\underset{\overset{|}{CH_3}}{\overset{|}{CH}}-CH_3$$

   (1) 2-Methyl-3-ethyl pentane
   (2) 3-Ethyl-2-methyl pentane
   (3) 3-Ethyl-4- methyl pentane
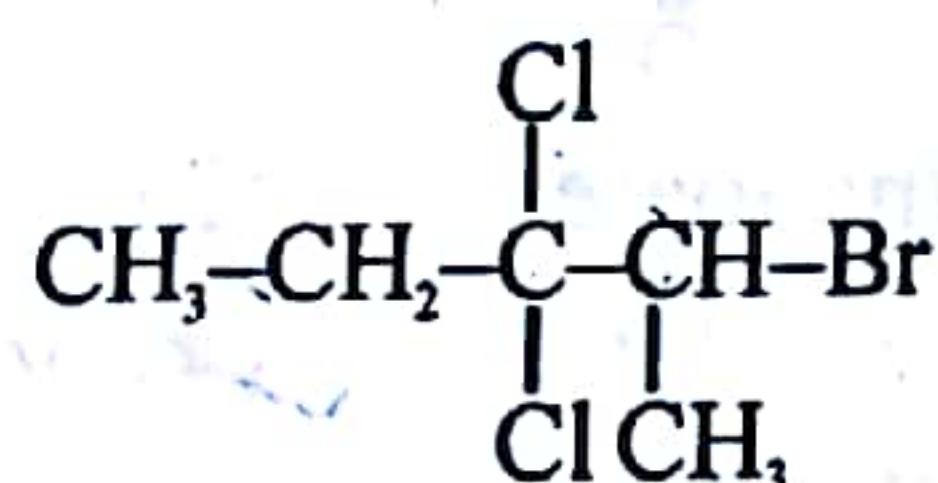   (4) 4-Methyl-3- ethyl pentane

61. The IUPAC name for Allyl alcohol is :-
    (1) Prop-1-en-3-ol
    (2) Prop-1-en-1-ol
    (3) Prop-3-en-1-ol
    (4) Prop-2-en-1-ol

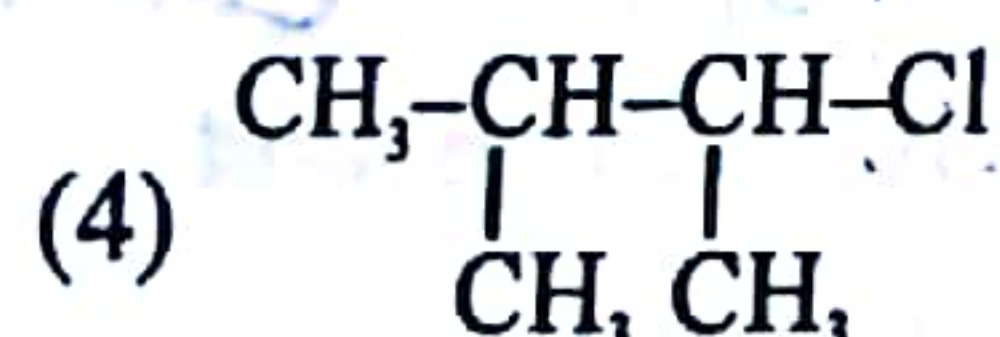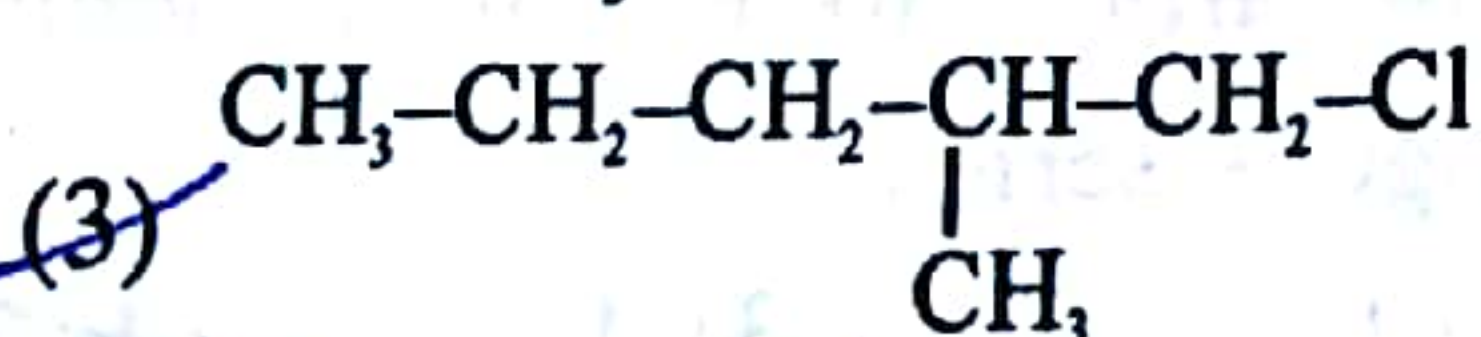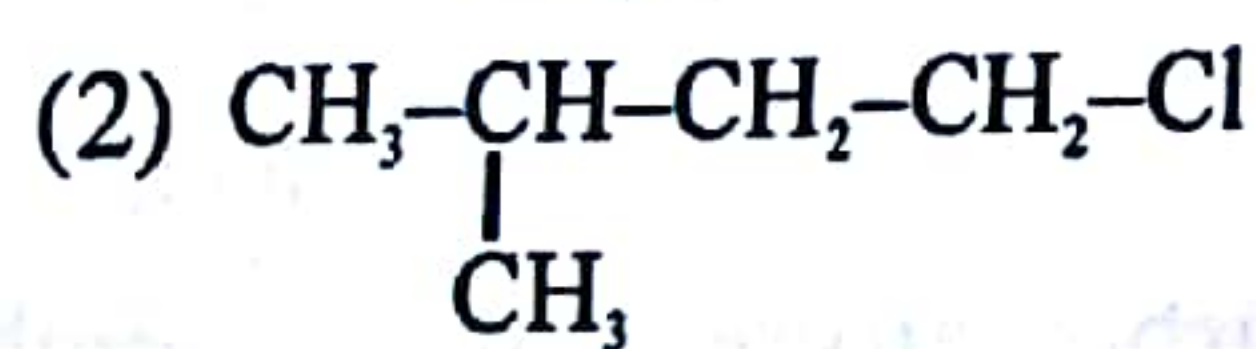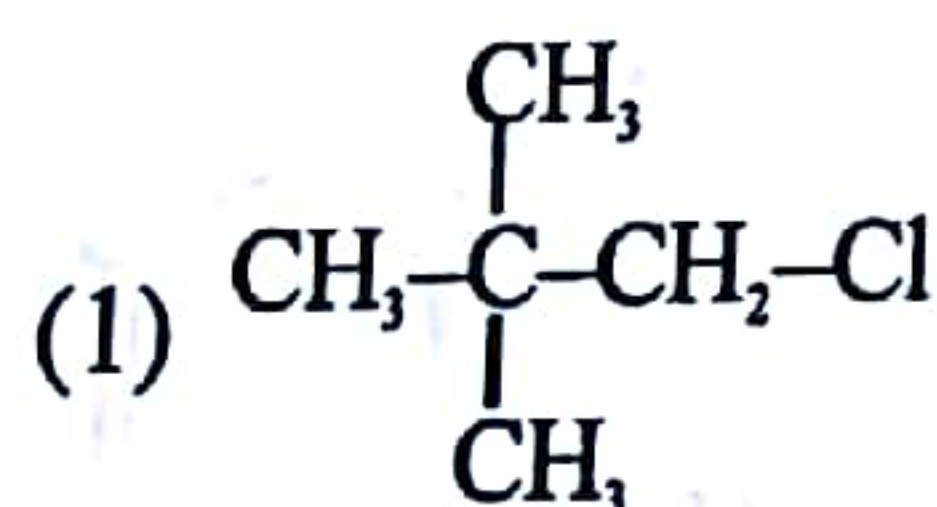62. The IUPAC name of the following compound is :-

$$O = C - CH - CH_2$$
$$\quad | \quad\quad | \quad\quad |$$
$$\quad OH \quad NH_2 \quad OH$$
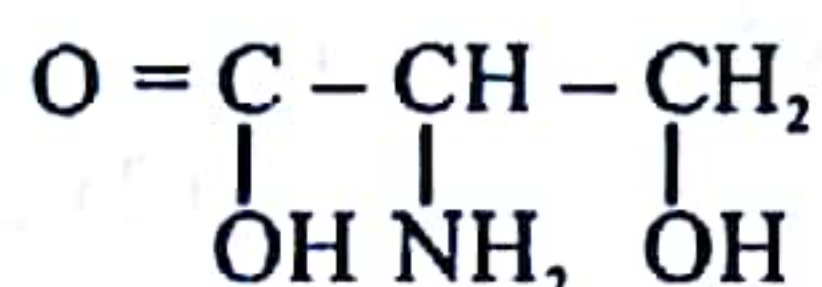
    (1) 3-Hydroxy-2-aminopropanoic acid
    (2) 2-Amino-3-hydroxy propanoic acid
    (3) 1-Oxopropane-1, 3-diol
    (4) 2-Amino-1-Oxopropane-1, 3-diol

63. Which of the following statement is incorrect about the following structure :-

$$CH_3$$
$$\quad |$$
$$CH_3 - C - NH_2$$
$$\quad |$$
$$\quad CH_3$$
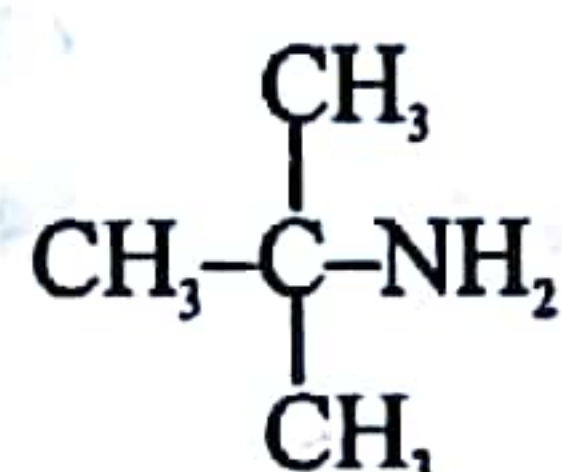
    (1) It is an example of 1° amine
    (2) It is an example of 3° amine
    (3) Common name of compound is tert butyl amine
    (4) IUPAC name of compound is 2-Methyl propan-2-amine

64. The IUPAC name of given compound is :-

$$\quad\quad\quad\quad Cl$$
$$\quad\quad\quad\quad |$$
$$CH_3 - CH_2 - C - CH - Br$$
$$\quad\quad\quad\quad | \quad |$$
$$\quad\quad\quad\quad Cl \quad CH_3$$

    (1) 3,3-Dichloro-4- bromopentane
    (2) 3,3-Dichloro-2-bromopentane
    (3) 1-Bromo-2-2-dichloro-1-methyl butane
    (4) 2-Bromo-3-3-dichloro pentane

65. Structure of 1-chloro-2-methyl pentane is :-

(1)
$$\quad\quad CH_3$$
$$\quad\quad |$$
$$CH_3 - C - CH_2 - Cl$$
$$\quad\quad |$$
$$\quad\quad CH_3$$

(2) $CH_3 - CH - CH_2 - CH_2 - Cl$
$$\quad\quad\quad |$$
$$\quad\quad\quad CH_3$$

(3) $CH_3 - CH_2 - CH_2 - CH - CH_2 - Cl$
$$\quad\quad\quad\quad\quad\quad\quad\quad |$$
$$\quad\quad\quad\quad\quad\quad\quad\quad CH_3$$

(4) $CH_3 - CH - CH - Cl$
$$\quad\quad |\quad\quad |$$
$$\quad\quad CH_3 \quad CH_3$$

66. The hybrid state of an each carbon atom in Buta-1,3-diene :-
    (1) sp^2, sp, sp, sp^2
    (2) sp^2, sp, sp^2, sp
    (3) sp^2, sp^2, sp^2, sp^2
    (4) sp, sp, sp, sp

67. The IUPAC name of $CH_3OCH_2CH_3$ is :-
    (1) Ethoxy methane
    (2) Methyl ethyl ether
    (3) Ethyl methyl ether
    (4) Methoxy ethane

68. Find out the no. of . 3° hydrogen atom in the following structure :-
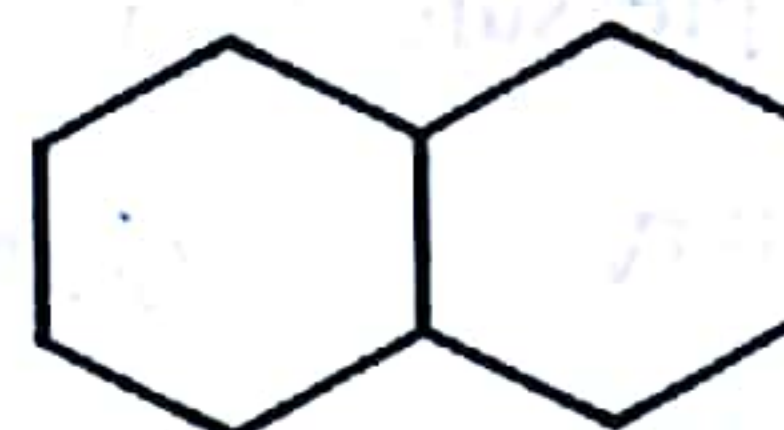
    (1) 4
    (2) 0
    (3) 2
    (4) 1

69. Correct order of Dipole moment is :-
    (1) $BeCl_2 < NF_3 < NCl_3 < NH_3$
    (2) $BeCl_2 < BF_3 < CH_4$
    (3) $HF < HCl < HBr < HI$
    (4) $F_2 < Cl_2 < Br_2 < I_2$

70. Which of the following does not have zero dipole moment ?

(1)

(2)

(3)
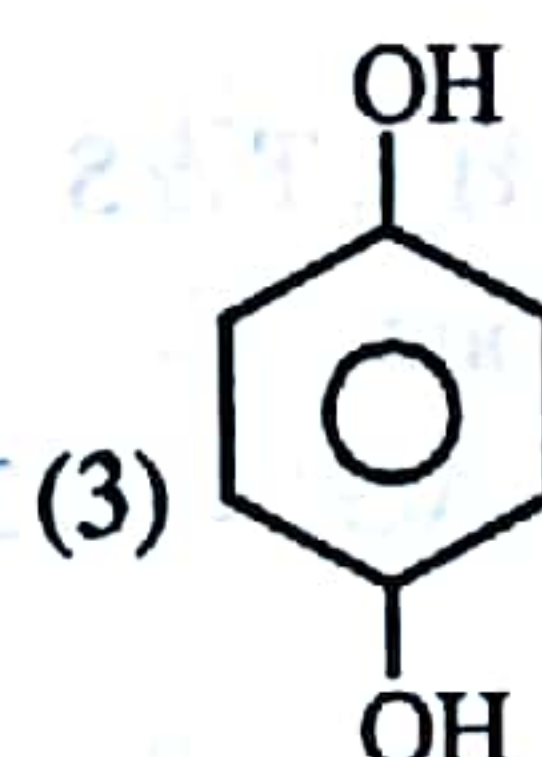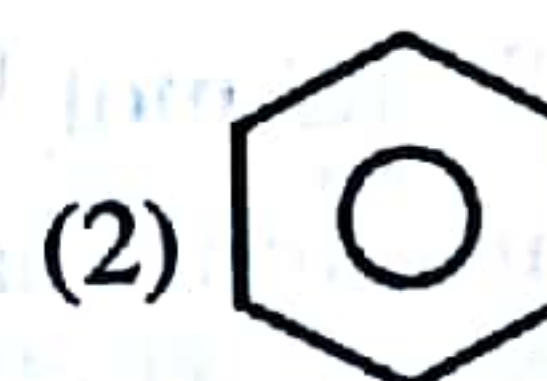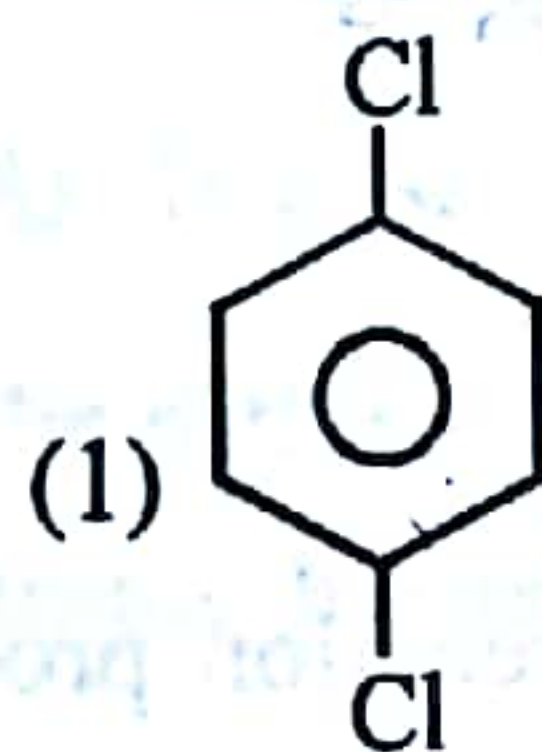
(4) None of these

71. Which of the following is not same for N_2^{2-} & O_2 :-
    (1) Bond order
    (2) Bond length
    (3) Paramagnetism
    (4) None

72. Which of the following is paramagnetic :-
    (1) B_2
    (2) O_2
    (3) S_2
    (4) All

73. Correct order of strength of H-bond is :-
    (1) $HF > H_2O > HCl > NH_3$
    (2) $HF > H_2O > NH_3 > HCl$
    (3) $HF < H_2O < HCl < NH_3$
    (4) $HF < H_2O < NH_3 < HCl$

74. Select the correct order of Boiling point :-
    (1) $HF > HCl > HBr > HI$
    (2) $HF < HCl < HBr > HI$
    (3) $HF > HI > HBr > HCl$
    (4) $HF < HI < HBr < HCl$

75. Which of the following is most soluble in water :-
    (1) LiOH
    (2) NaOH
    (3) KOH
    (4) RbOH

76. Select the correct order of ionic character :-
    (1) $SrCl_2 > CdCl_2 > SnCl_2$
    (2) $SrCl_2 < CdCl_2 < SnCl_2$
    (3) $SrCl_2 > SnCl_2 > CdCl_2$
    (4) $CdCl_2 > SnCl_2 > SrCl_2$

77. The reason for solubility of HCl in water is due to :-
    (1) Keesom force
    (2) Debye force
    (3) London-Dispersion force
    (4) None

78. Which of the following compound upon thermal decomposition yield two paramagnetic gases ?
    (1) $LiNO_3$
    (2) $NaNO_3$
    (3) KNO_3
    (4) $RbNO_3$

79. The mass of molecule of the compound $C_{60}H_{122}$ is :-
    (1) 842 g
    (2) 842 amu
    (3) $\dfrac{842}{6.02 \times 10^{23}}$ g
    (4) Both (2) & (3)

80. The percentage of Se in peroxidase anhydrous enzyme is 0.5% by mass. The minimum molecular weight of the enzyme is:
    (Atomic Mass of Se = 78.4)
    (1) 1.568×10^4
    (2) 1.568×10^3
    (3) 15.68
    (4) 3.136×10^4

81. A sample of PCl_3 contains 1.4 moles of the substance. How many atoms are there in the sample ?
    (1) 4
    (2) 5.6
    (3) 8.431×10^{23}
    (4) 3.372×10^{24}

82. Total number of protons in 10 g of calcium carbide is ?
    (1) 1.505×10^{23}
    (2) 2.04×10^{28}
    (3) 3.011×10^{23}
    (4) 3.011×10^{24}

83. During electrolysis of H_2O, the volume of O_2 liberated is 2.24 dm³. The volume of H_2 liberated under same conditions is :-
    (1) 2.24 dm³
    (2) 1.12 dm³
    (3) 4.48 dm³
    (4) 0.56 dm³

84. 20 mL of methane is completely burnt using 50 mL of oxygen. The volume of the gas left after cooling to room temperature is -
    (1) 80 mL
    (2) 40 mL
    (3) 50 mL
    (4) 30 mL

85. The molarity of orthophosphoric acid having purity of 70% by mass and density 1.54, would be -
    (1) 11 M
    (2) 22 M
    (3) 33 M
    (4) 44 M

86. The number of moles of oxygen in 1 L of air containing 21% oxygen by volume, in standard conditions is :-
    (1) 0.186 mole
    (2) 0.21 mole
    (3) 2.10 mole
    (4) 0.0093 mole

87. In the reaction.
    $$2Al_{(s)} + 6HCl_{(aq)} \longrightarrow 2AlCl_{3(aq)} + 3H_{2(g)}$$
    (1) 6 L HCl(aq) is consumed for every 3L H_2(g) produced
    (2) 33.6 L of H_2 (g) is produced for every mole of Al at any temperature and pressure.
    (3) 67.2 L H_2(g) at 1 atm and 273 K is produced for every mole of Al that reacts.
    (4) 11.2 L H_2(g) at 1 atm and 273 K is produced for every mole HCl (aq) consumed.

88. What is mass of N_2F_4 produced by the reaction of 2.0 g of NH_3 and 8.0 g of F_2
    $$2NH_3 + 5F_2 \longrightarrow N_2F_4 + 6HF$$
    (1) 6.11 g
    (2) 4.33 g
    (3) 7.92 g
    (4) 10 g

89. 2 g sample of Fe_2O_3 on strong heating leaves a residue weighing 1.16 g as per following reaction:-
    $$Fe_2O_{3(s)} \longrightarrow Fe_3O_4(s) + O_2(g)$$
    What is percentage purity of Fe_2O_3 sample
    (1) 90 %
    (2) 80 %
    (3) 60%
    (4) 40%

90. What is percentage of oxygen present in the compound $Ca_3(PO_4)_2$?
    (1) 20.6%
    (2) 41.3 %
    (3) 82.6 %
    (4) 17.08 %

TOPIC : Digestive system, Respiratory system, Animal Diversity Plant Diversity, Plant morphology, Plant Anatomy, Transport in plants (Passive & Active Transport upto OPD)

91. Identify the peculiar cell of the animal kingdom shown below as well as the related right place of its occurence in animal group and select the right option for the two together ?

Option :-

	Name of Peculiar cell	Right place of occurence in animal group
(1)	Lasso cell	Ctenophora
(2)	Choanocyte	Porifera
(3)	Cnidoblast	Coelenterata
(4)	Flame cell	Cephalochordata

92. The figure given below shows a diagramatic sectional view of animal. Select the correct option in which giving correct identification together with what it represent and their example ?
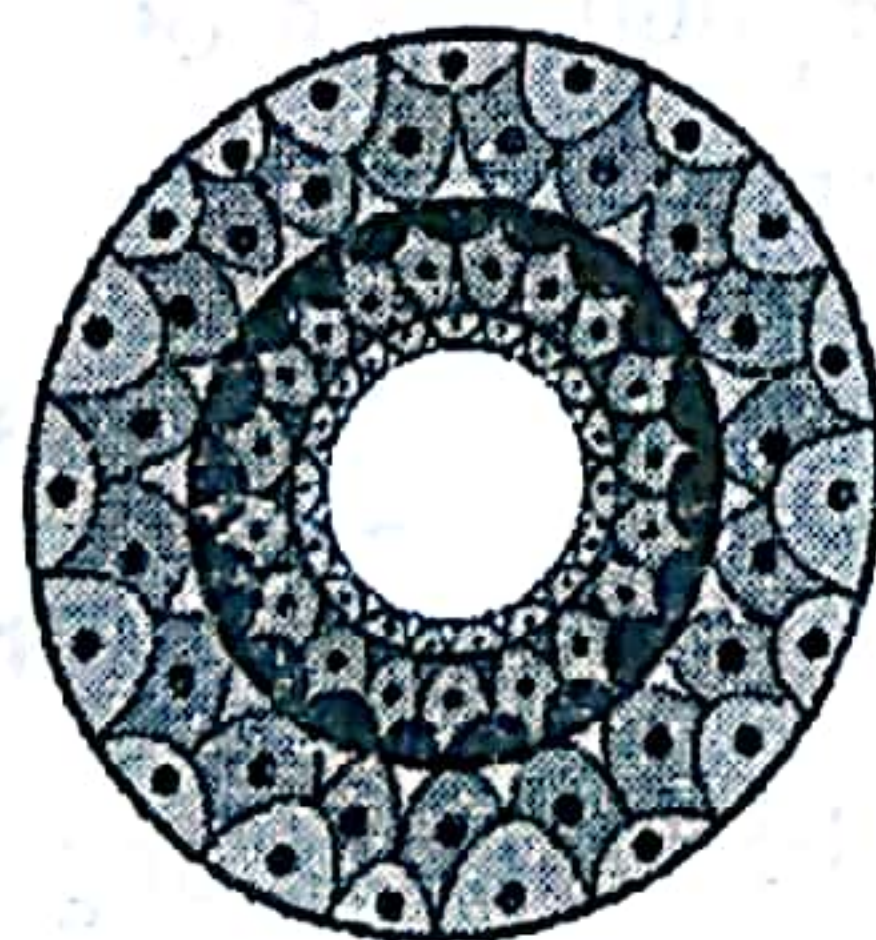
Option :-
(1) Coelomate : Body cavity is lined by the mesoderm. Example - Annelids
(2) Pseudocoelomate : Body cavity is not lined by mesoderm. Example - Nematoda
(3) Acoelomate : Body cavity is absent Example - Platyhelminthes
(4) Coelomate : Body cavity fills up by mesodermal pouches Example : Aschelminthes

93. Select the incorrect statement from followings ?
(1) In Obelia polyp and medusa, both forms are formed in life cycle
(2) In Obelia polyp sexually reproduce and to form medusa
(3) In Obelia medusa sexually reproduce and to form polyp
(4) In Obelia polyp asexually reproduce and to form medusa

94. Consider the following four statement (a-d) and select the option which includes all the correct ones only ?
(a) All sponges are primitive, multicellular animals having tissue level of body organisation
(b) Few coelenterates have exoskeleton which is made up $CaCO_3$ are known as corals
(c) Mostly cnidarians are aquatic, fixed or free floating and radially symmetrical animals
(d) All sponges are unisexual animals and completes internal fertilization

Option :-
(1) Statements 'a' & 'b'
(2) Statements 'b' & 'c'
(3) Statements 'c' & 'd'
(4) Statements 'b', 'c' and 'd'

95. Identify the following four animals (A, B, C and D) given below. Which one of these is not correctly identified in the option given along with its correct taxonomic group and their common name ?

A   B   C   D

Options :-

Option	Fig.	Name of animal	Taxonomic group	Common Name
(1)	B	Adamsia	Ctenophora	Star coral
(2)	D	Spongilla	Porifera	Fresh water sponge
(3)	C	Aurelia	Coelenterata	Jelly fish
(4)	A	Euspongia	Porifera	Bath sponge

96. Read the following features :-

(i) Commonly known as "Round worm"

(ii) Animals are bilateral symmetrical and triploblastic

(iii) Exclusively parasite on animals

(iv) Pseudocoelomate animals having organ-system level of body organisation

(v) Body shows segmentation

(vi) Alimentory canal complete with well developed muscular pharynx

(vii) Animals are bisexual and shows sexual dimorphism

(viii) Fertilization internal and direct or indirect development.

Out of these how many features are not exhibited by members of Aschelminthes ?

(1) Two   (2) Three

(3) Four   (4) One

97. Which of the following options gives the correct categorisation of six animals according to the types of their symmetry (A, B & C) :-

	'A' Asymmetrical animals	'B' Radial symmetrical animal	'C' Bilateral symmetrical animals
(1)	Sycon	Spongilla hemidectylus aurelia	Pheretima, Taenia
(2)	Spongilla, Taenia	Sycon	Pheretima, Hemidectylus, Sycon
(3)	Sycon, Spongilla	Aurelia	Pheretima, Hemidectylus, Taenia
(4)	Sycon, Spongilla, Aurilea	Pheretima, Taenia	Hemidectyles

98. Read following statement carefully with regards to "Sea walnut"

"The body of sea walnut bears....(A)....external rows of ciliated comb plates which help in...(B)...."

Select the correct option which correctly fills up the both blanks (A) and (B) respectively ?

Option :-

(1) Eight, Digestion

(2) Eight, Locomotion

(3) Six, Locomotion

(4) Six, digestion

99. Body of "Arthropodes" covers by exoskeleton which is made up by :-

(1) Calsium carbonate

(2) Silica

(3) Chitin

(4) Calsium carbonate + Silica

100. How many animals in the given list are respired through gills ?

Prawn, Labeo, Myxine, Bufo, Dentalium, Euplectella, Hydra, Salpa, Trygon, Amphioxus, Pavo, Apis.

(1) Six   (2) Seven   (3) Nine   (4) Five

101. Read the following five features (a - e) :-

(a) Notochord is present in any stage of life cycle

(b) Central nerve cord is present at midventral surface which is solid and double in animals

(c) Gills slits are present in any stage of life cycle

(d) A "post anal tail" is present in animals

(e) Dorsal heart is present in body of animals.

From above features which are not suitable features for chordate animal ?

Option :-

(1) 'b' and 'e'

(2) 'b', 'c' and 'e'

(3) Only 'b'

(4) 'c' and 'd'

102. Read the following four features (A-D) :-

(A) Gills-slits are covered by "operculum"

(B) The skin is tough, containing minute placoid scales.

(C) In male, pelvic fins bear claspers

(D) Air bladder is present which regulates buoyancy.

Out of these how many features are not exhibited by cartilagenous fishes ?

(1) Four   (2) Three   (3) One   (4) Two