

WBJEE 2026 Physics and Chemistry

Question Paper

Conducted by West Bengal Joint Entrance Examinations Board



General Instructions

- (i) **Duration:** The total duration of the examination is 2 hours (120 minutes).
- (ii) **Total Marks:** The paper carries a maximum of 100 marks.
- (iii) **Total Questions:** The paper contains a total of 80 questions, Physics and Chemistry with 40 questions each.
- (iv) **Structure:** The paper has 3 question categories in each subject:
 - **Category 1:** 30 questions for 1 mark each with negative marking of 0.25.
 - **Category 2:** 5 questions for 2 marks each with negative marking of 0.5.
 - **Category 3:** 5 questions for 2 marks each with no negative marking.
- (v) **Compulsory Questions:** All 80 questions are compulsory.

Physics

1. A body of density ' ρ ' is dropped slowly on the surface of a lake of depth d . If the density of the lake water be ' ρ' ' ($\rho' < \rho$) then the time taken by the body to reach the bottom of the lake is

- (A) $\left[\frac{2d\rho}{g(\rho-\rho')} \right]^{\frac{1}{2}}$
- (B) $\left[\frac{2gd}{\rho(\rho-\rho')} \right]^{\frac{1}{2}}$
- (C) $\left[\frac{2d\rho'}{\rho g(\rho-\rho')} \right]^{\frac{1}{2}}$
- (D) $\left[\frac{g(\rho-\rho')}{2d\rho} \right]^{\frac{1}{2}}$

2. Beyond what distance, the ray optics is sufficiently valid when the aperture is 6 mm wide and the wavelength is $6000 \text{ \AA}$?

- (A) 50 m
 - (B) 60 m
 - (C) 40 m
 - (D) 10 m
-

3. A plano-convex lens fits exactly into a plano-concave lens. Their plane surfaces are parallel to each other. If lenses are made of different materials of refractive indices μ_1 and μ_2 and R is the radius of curvature of the curved surface of the lenses, then the focal length of the combination is

- (A) $\frac{R}{(\mu_1 - \mu_2)}$
 - (B) $\frac{2R}{(\mu_1 - \mu_2)}$
 - (C) $\frac{R}{2(\mu_1 + \mu_2)}$
 - (D) $\frac{R}{2(\mu_1 - \mu_2)}$
-

4. Consider a fuse wire of length l and radius r . The time of heating (t) for passing the maximum current will depend on

- (A) $t \propto r^2 l$
 - (B) $t \propto r^3 l^2$
 - (C) $t \propto r^4 l^0$
 - (D) $t \propto r^2 l^3$
-

5. Density and volume of a body are given as $(20 \pm 4) \text{ g/cm}^3$ and $(10 \pm 1) \text{ cm}^3$ respectively. The absolute error in measurement of mass is

- (A) 20 gm
- (B) 30 gm
- (C) 45 gm

(D) 60 gm

6. If a vector $\vec{v} = 3\hat{i}$ is rotated in the $x - z$ plane by an angle θ with respect to x -axis in the clockwise direction, then for an observer at $+y$ axis the vector will be

- (A) $3 \sin \theta \hat{i}$
 - (B) $3 \cos \theta \hat{i}$
 - (C) $3 \sin \theta \hat{i} + 3 \cos \theta \hat{k}$
 - (D) $3 \cos \theta \hat{i} + 3 \sin \theta \hat{k}$
-

7. A circular coil, carrying current, has radius R . The distance from the centre of the coil on the axis where the magnetic induction will be $\frac{1}{27}$ th of its value at the centre of the coil is

- (A) $2\sqrt{2}R$
 - (B) $3\sqrt{2}R$
 - (C) $3R$
 - (D) $2\sqrt{3}R$
-

8. A square of side L lies in the $x - y$ plane, where the magnetic field is given by $\vec{B} = B_0(2\hat{i} + 3\hat{j} + 4\hat{k})$ where B_0 is constant. The magnetic flux passing through the square is

- (A) $5B_0L^2$
 - (B) $2B_0L^2$
 - (C) $3B_0L^2$
 - (D) $4B_0L^2$
-

9. A resistor of resistance ' R ' draws power ' P ' when connected to an AC source. If an inductance is now placed in series with R , such that the impedance of the circuit becomes ' Z ', the power drawn will be

- (A) $P \left(\frac{R}{Z} \right)$
- (B) $P \left(\frac{R}{Z} \right)^3$

- (C) $P \left(\frac{R}{Z} \right)^2$
(D) $P \sqrt{\frac{Z}{R}}$
-

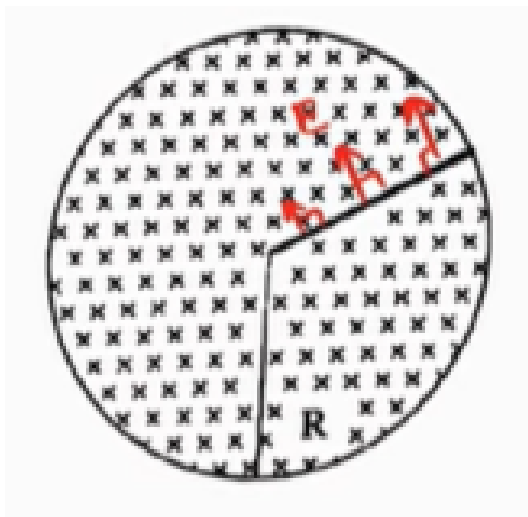
10. A simple pendulum of length l has a bob of mass m , with a charge q . On it a vertical sheet of charge, with surface charge density ' σ ' passes through the point of suspension. At equilibrium, if the string makes an angle θ with the vertical, then

- (A) $\tan \theta = \frac{\sigma q}{2\epsilon_0 mg}$
(B) $\tan \theta = \frac{\sigma q}{\epsilon_0 mg}$
(C) $\cot \theta = \frac{\sigma q}{2\epsilon_0 mg}$
(D) $\cot \theta = \frac{\sigma q}{\epsilon_0 mg}$
-

11. The equation of a transverse wave is $y = y_0 \sin 2\pi(f t - \frac{x}{\lambda})$. If the maximum particle velocity be four times that of wave velocity then

- (A) $\lambda = \frac{\pi y_0}{4}$
(B) $\lambda = \frac{\pi y_0}{2}$
(C) $\lambda = \pi y_0$
(D) $\lambda = 2\pi y_0$
-

12. A uniform but time varying magnetic field is present in a circular region of radius ' R '. The magnetic field is perpendicular and into the plane of loop and the magnitude of field is increasing at a constant rate α . There is a straight conducting rod of length $2R$ placed as shown in figure. The magnitude of induced emf across the rod is



- (A) $\pi R^2 \alpha$
 (B) $\frac{1}{2} \pi R^2 \alpha$
 (C) $\frac{1}{\sqrt{2}} R^2 \alpha$
 (D) $\frac{1}{4} \pi R^2 \alpha$

13. From a tower of height H , a particle is thrown vertically upwards with a speed u . The time taken by the particle to hit the ground is n times that taken by it to reach the highest point of its path. The relation between H, u and n is

- (A) $2gH = n^2 u^2$
 (B) $gH = (n - 2)^2 u^2$
 (C) $2gH = nu^2(n - 2)$
 (D) $2gH = u^2(n - 2)^2$

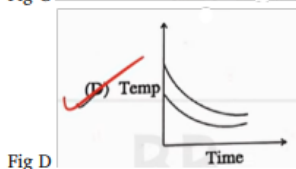
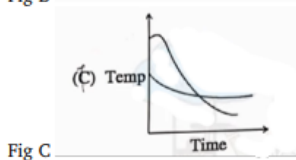
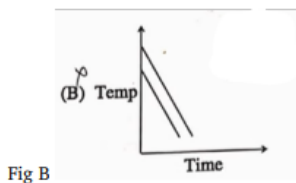
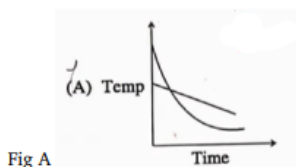
14. There is a ring of radius r having linear charge density λ and rotating with a uniform angular velocity ω . The magnitude of the magnetic field produced by this ring at its own centre would be (μ_0 = permeability of air)

- (A) $\frac{\lambda \omega^2}{2 - \mu_0}$
 (B) $\frac{\mu_0 \lambda^2 \omega}{\sqrt{2}}$
 (C) $\frac{\mu_0 \lambda \omega}{2}$
 (D) $\frac{\mu_0 \lambda}{2 \omega^2}$

15. Three vectors $\vec{a}$, $\vec{b}$ and $\vec{c}$ are such that $|\vec{a}| = 1$, $|\vec{b}| = 2$ and $|\vec{c}| = 4$ along with $\vec{a} + \vec{b} + \vec{c} = 0$. Then, the value of $4\vec{a} \cdot \vec{b} + 3\vec{b} \cdot \vec{c} + 3\vec{c} \cdot \vec{a}$ will be

- (A) 27
- (B) -26
- (C) -68
- (D) -34

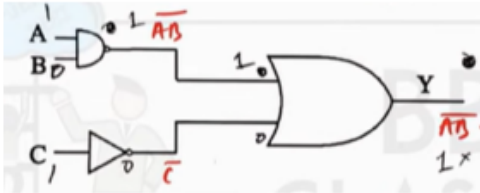
16. Two identical metal bars are heated in two different temperatures and allowed to cool in the same surroundings. Which one of the following figures correctly shows their cooling curves?



- (A) Graph with crossing cooling curves
- (B) Graph with curves starting at same T

- (C) Graph with non-asymptotic cooling
 (D) Graph with exponential decay curves that don't cross

17. The inputs to a digital circuit are as shown below. The output Y is

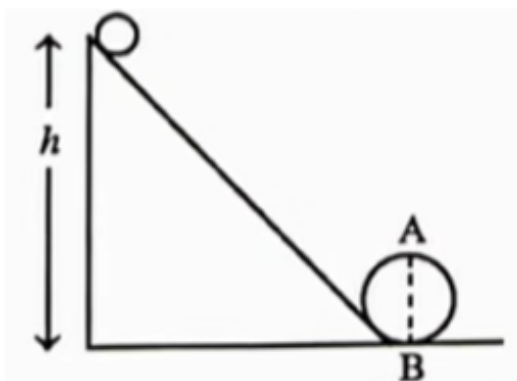


- (A) $A + B + \bar{C}$
 (B) $(A + B)\bar{C}$
 (C) $\bar{A} + \bar{B} + \bar{C}$
 (D) $\bar{A} + \bar{B} + C$

18. The velocity v of a particle at time t is given by $v = at + \frac{b}{t+c}$, where a, b and c are constants. The dimension of a, b and c are, respectively

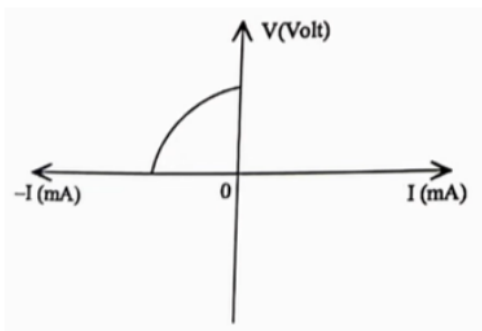
- (A) LT^{-2}, LT, L
 (B) L, LT, T^2
 (C) LT^{-2}, L, T
 (D) L^2, T, LT^2

19. A body initially at rest and sliding along a frictionless track from a height 'h' (as shown in figure) just completes a vertical circle of diameter $AB = d$. The height 'h' is equal to



- (A) $\frac{3}{2}d$
(B) $\frac{5}{4}d$
(C) $\frac{7}{5}d$
(D) $\frac{d}{2}$
-

20. The I-V characteristics graph shown below is exhibited by

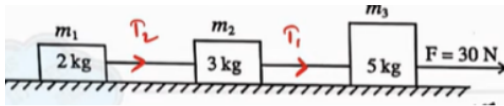


- (A) LED
(B) Zener diode
(C) Photodiode
(D) Solar cell
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21. A person has a minimum distance of distinct vision of 50 cm. The power of lenses required to read a book at a distance of 25 cm is

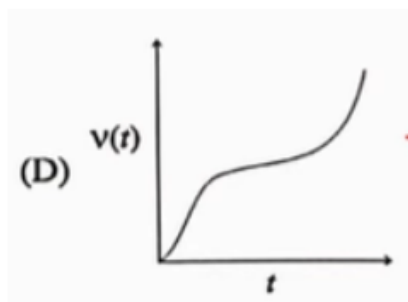
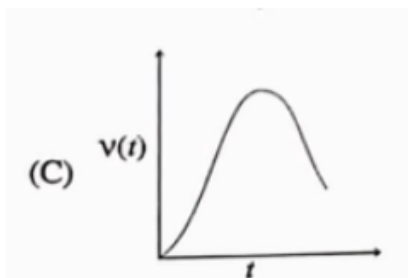
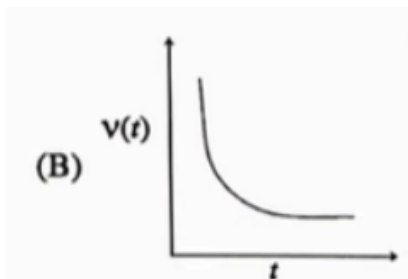
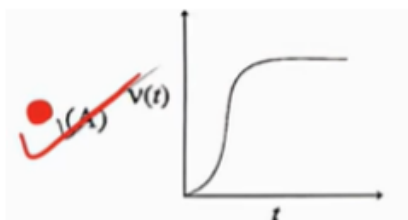
- (A) 3 D
(B) 1 D
(C) 2 D
(D) 5 D
-

22. Three blocks of masses $m_1 = 2 \text{ kg}$, $m_2 = 3 \text{ kg}$ and $m_3 = 5 \text{ kg}$ are placed on a horizontal frictionless surface and a force of 30 N pulls the system as shown below. The value of tension T will be



- (A) 15 N
- (B) 30 N
- (C) 6 N
- (D) 10 N

23. Which one of the following graphs represents the velocity-time ($v - t$) graph of a small spherical body falling in a viscous liquid?



- (A) [Graph A: Curve starting from origin and becoming horizontal]
 (B) [Graph B: Curve starting from positive v and becoming horizontal]
 (C) [Graph C: Parabolic curve]
 (D) [Graph D: Linear upward curve]

24. A ray of light travelling in air is incident on one face of a parallel glass slab of thickness t and refractive index μ at an angle of incidence i . Total time spent by the ray inside the slab is

(A) $\frac{\mu^2 t}{c \sqrt{1 - \mu^2 \sin^2 i}}$

- (B) $\frac{\mu t}{c\sqrt{\mu^2 - \sin^2 i}}$
 (C) $\frac{\mu^2 t}{c\sqrt{\mu^2 - \sin^2 i}}$
 (D) $\frac{t}{c\sqrt{\mu^2 - \sin^2 i}}$
-

25. Radiation of wavelength λ is incident on a photocell. The fastest emitted electron has speed v . If the wavelength is changed to $\frac{3\lambda}{4}$, then the speed of the fastest emitted electron will be

- (A) greater than $v\sqrt{\frac{4}{3}}$
 (B) less than $v\sqrt{\frac{4}{3}}$
 (C) equal to $v\sqrt{\frac{4}{3}}$
 (D) equal to $v\sqrt{\frac{3}{4}}$
-

26. Two spherical soap bubbles of radii r_1 and r_2 in vacuum coalesce under isothermal condition. The newly formed bubble has a radius (r) given by

- (A) $r_1 + r_2$
 (B) $\frac{r_1 + r_2}{2}$
 (C) $\frac{r_1 r_2}{r_1 + r_2}$
 (D) $\sqrt{r_1^2 + r_2^2}$
-

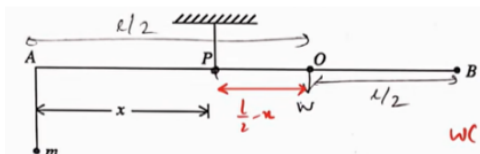
27. A radioactive element ${}_{92}^{242}\text{X}$ emits two α -particles, one electron and two positrons. The transformed nucleus is represented by ${}_P^{234}\text{Y}$. The value of P is

- (A) 85
 (B) 87
 (C) 92
 (D) 96
-

28. The magnetic moment of an iron bar is M . It is now bent in such a way that it forms an arc section of a circle subtending an angle of 60° at the centre. The magnetic moment of the arc section is

- (A) $\frac{3M}{\pi}$
 (B) $\frac{4M}{\pi}$
 (C) $\frac{M}{\pi}$
 (D) $\frac{2M}{\pi}$

29. A uniform rod AB is suspended from a point P, at a variable distance x from A, as shown in figure. To make the rod horizontal, a mass 'm' is suspended from its end A. Which set of variables will give a straight line when they are plotted?



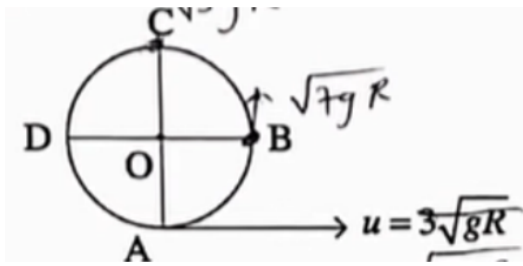
- (A) m, x^2
 (B) $m, \frac{1}{x^2}$
 (C) $m, \frac{1}{x}$
 (D) m, x

30. A pipe A is connected with other pipes B and C as shown in the figure. The areas of cross-section of A, B and C are respectively $\alpha, \frac{\alpha}{2}$ and $\frac{\alpha}{4}$. If the velocities of flow of water through A and B are 10 m/sec and 6 m/sec, respectively, then velocity of flow, V_c along C is



- (A) 21 m/sec
 (B) 12 m/sec
 (C) 28 m/sec
 (D) 18 m/sec

31. A particle of mass m is suspended from a point O by a string of length R . It is given a velocity $u = 3\sqrt{gR}$ at the bottom. The difference in tension at point B and at the point C is



- (A) 6 mg
- (B) 4 mg
- (C) 3 mg
- (D) 8 mg

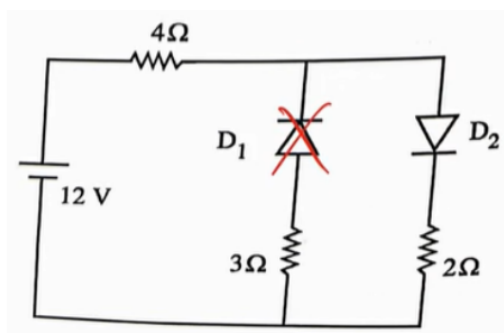
32. The de-Broglie wavelength of an electron in 4th orbit is (where r = Radius of the 1st orbit)

- (A) $2\pi r$
- (B) $4\pi r$
- (C) $8\pi r$
- (D) $16\pi r$

33. An electromagnetic wave, whose wave normal makes an angle of 45° with the vertical, is travelling in air and strikes a horizontal liquid surface. While travelling through the liquid, it gets deviated by 15° . If the speed of electromagnetic wave in air is 3×10^8 m/s, then the speed of electromagnetic wave in the liquid will be

- (A) $\frac{\sqrt{2}}{3} \times 10^8$ m/s
- (B) 1.5×10^8 m/s
- (C) 2.1×10^8 m/s
- (D) 2.5×10^8 m/s

34. The circuit has two oppositely connected ideal diodes in parallel as shown in the figure. What is the current flowing in the circuit?

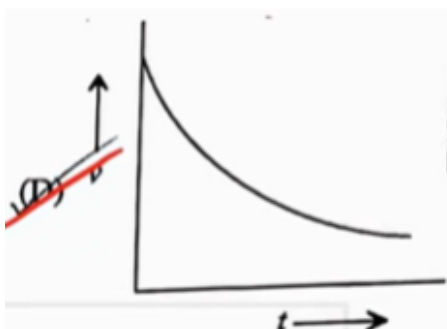
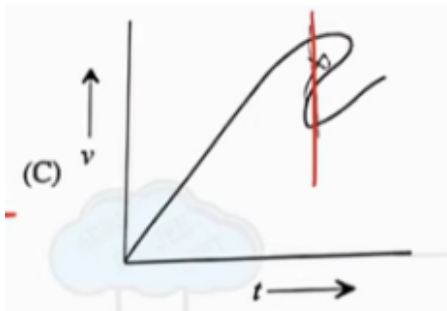
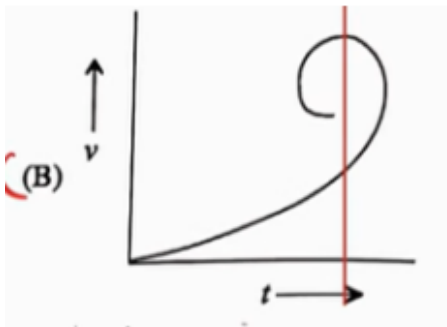
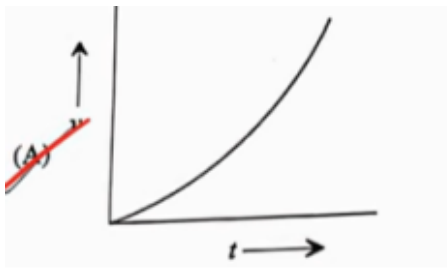


- (A) 1.33 A
- (B) 1.71 A
- (C) 2.00 A
- (D) 2.31 A

35. 2 moles of an ideal gas with $\frac{C_p}{C_v} = \frac{5}{3}$ are mixed with 3 moles of another ideal gas with $\frac{C_p}{C_v} = \frac{4}{3}$. The value of $\frac{C_p}{C_v}$ for the mixture is

- (A) 1.5
- (B) 1.42
- (C) 1.48
- (D) 1.6

36. Which of the velocity-time ($v - t$) graph(s) can possibly represent one-dimensional motion of a particle?



(A) Graph A

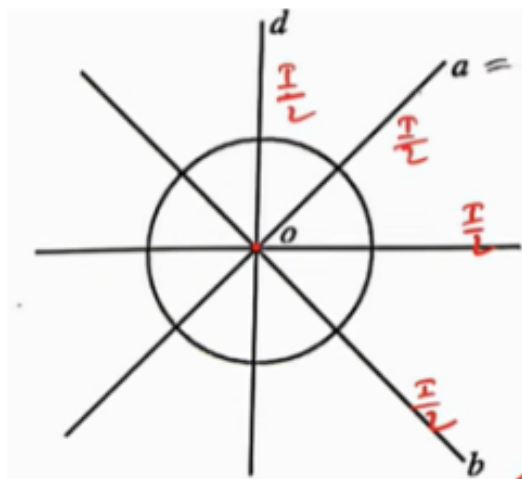
(B) Graph B

(C) Graph C

(D) Graph D

37. The moment of inertia of a thin disc about axes a, b, c, d are I_1, I_2, I_3 and I_4 respectively, as shown in figure. If the moment of inertia about an axis passing through the centre and

perpendicular to the plane of the disc is I then,

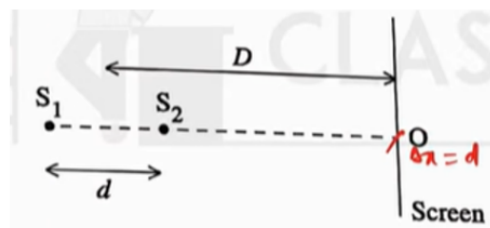


- (A) $I = I_1 + I_2$
- (B) $I = I_3 + I_4$
- (C) $I = I_1 + I_3$
- (D) $I = I_1 + I_2 + I_3 + I_4$

38. The displacement current flows through a capacitor when the voltage across its plates

- (A) becomes zero
- (B) is increasing with time
- (C) is decreasing with time
- (D) attains a constant value

39. Two points of monochromatic and coherent sources of light of wavelength λ each, are placed as shown in figure. The initial phase difference between the sources is zero, ($D \gg d$). Mark the correct statement(s).



- (A) If $d = \frac{7\lambda}{2}$, O will be a minima

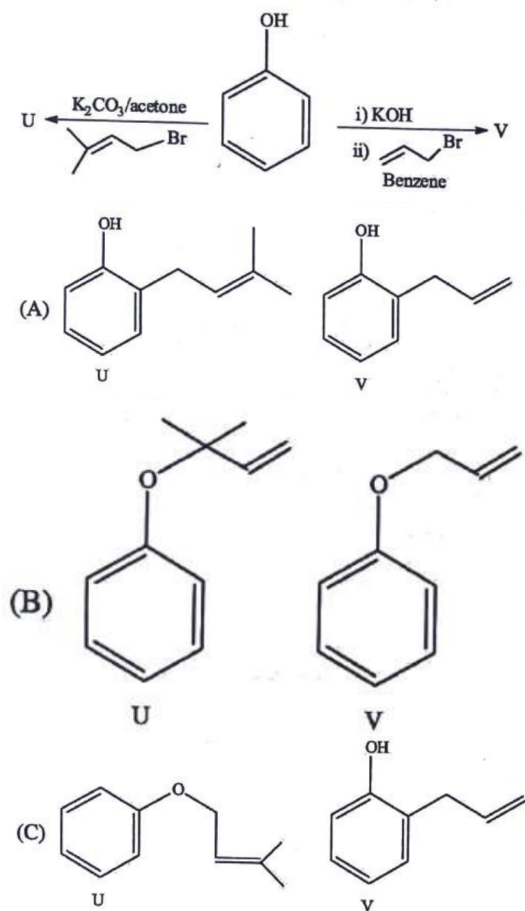
- (B) If $d = \lambda$, only one maxima can be observed on the screen
- (C) If $d = 4.8\lambda$, then total 5 minima would be there on the screen
- (D) If $d = \lambda$, the intensity at O would be minimum

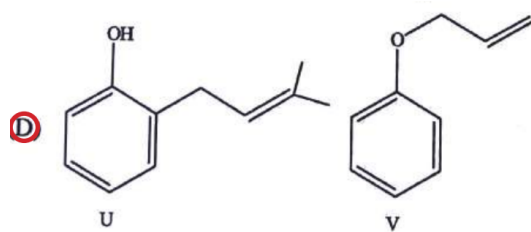
40. For Boolean variables A and B , $A \oplus B = \overline{AB} + \overline{A}B$. Then, which of the following statements is/are correct?

- (A) $1 \oplus A = \overline{A}$
- (B) $A \oplus A = 0$
- (C) $0 \oplus A = 0$
- (D) $A \oplus A = 1$

Chemistry

41. The major products U and V in the following reaction are



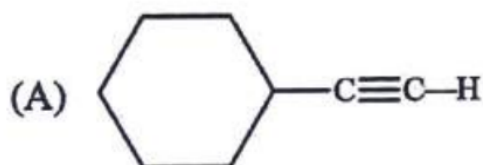
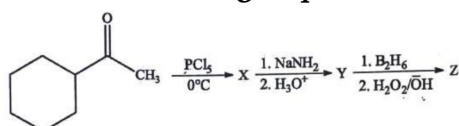


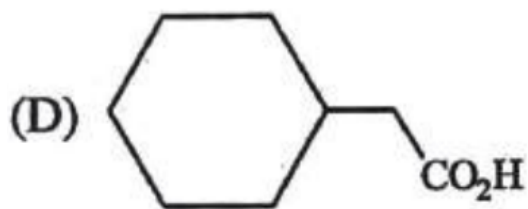
- (A) Fig A
(B) Fig B
(C) Fig C
(D) Fig D

42. Among N_2O , ClF_2^- , SO_2 and I_3^+ , the species having the linear structures are

- (A) N_2O , ClF_2^-
(B) ClF_2^- , I_3^+
(C) I_3^+ , SO_2
(D) N_2O , SO_2

43. In the following sequence of reactions, what is the end product 'Z'?





- (A) Fig A
(B) Fig B
(C) Fig C
(D) Fig D

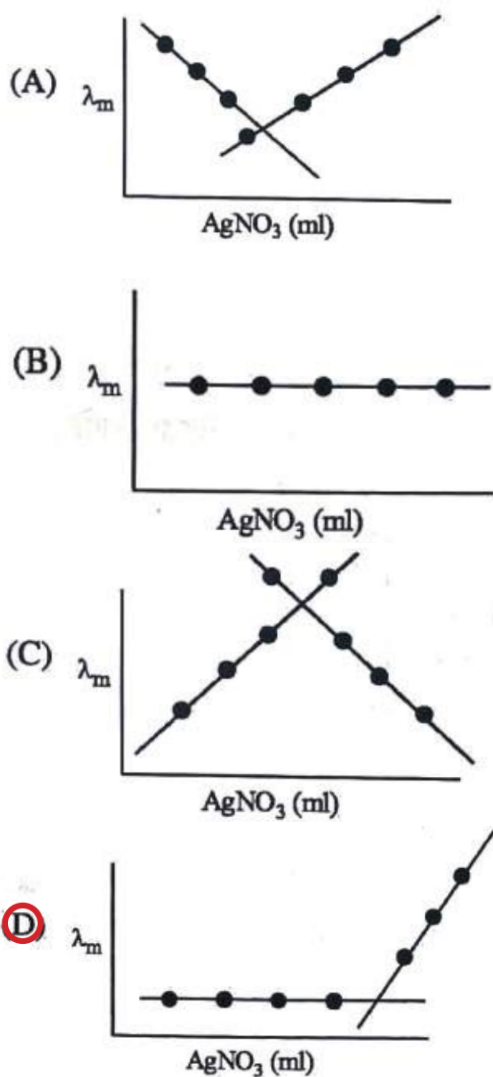
44. A compound (X) when treated with CuSO_4 solution yields a brown precipitate. On adding hypo solution the precipitate turns white. The compound (X) is

- (A) KBr
(B) K_2CrO_3
(C) KI
(D) K_3PO_4

45. Three engines A, B and C take steam at 130°C and reject it at 20°C , 40°C and 50°C respectively. The most efficient engine will be

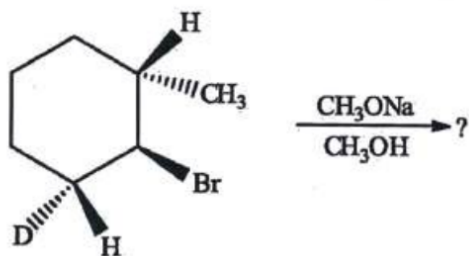
- (A) A
(B) B
(C) C
(D) All the three engines will be equally efficient

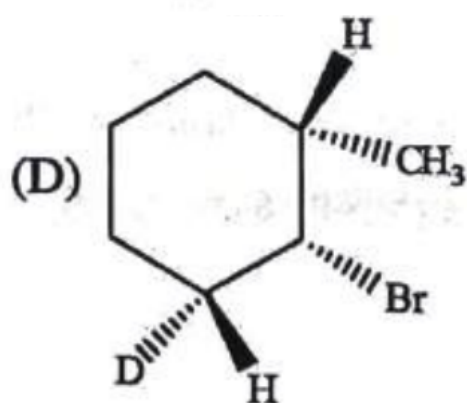
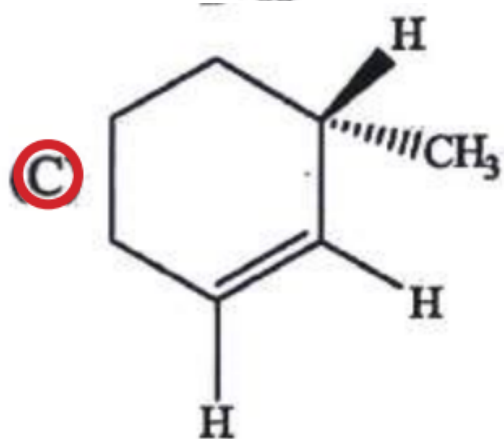
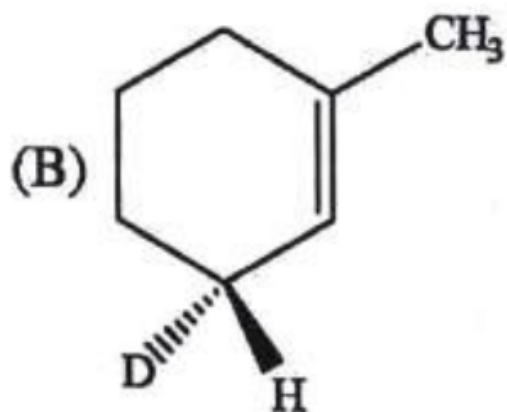
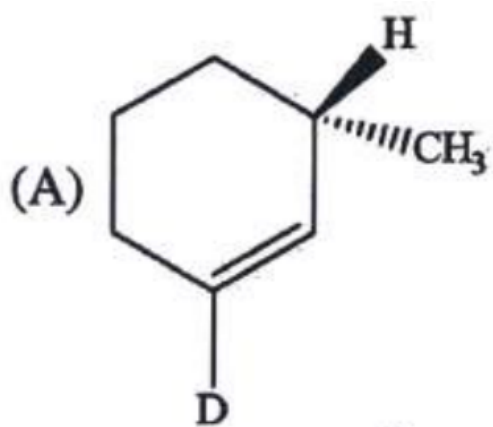
46. In a conductance experiment, aqueous AgNO_3 solution is added to aqueous KCl solution gradually and simultaneously the molar conductivity (λ_m) is measured. The correct plot of λ_m versus volume of AgNO_3 solution is



- (A) Fig A
(B) Fig B
(C) Fig C
(D) Fig D

47. Indicate the major product of the following reaction:





(A) Fig A

(B) Fig B

(C) Fig C

(D) Fig D

48. The van't Hoff Factor (i) for a dilute aqueous solution of Na_2SO_4 is

(A) $1 - \alpha$

(B) $1 - 2\alpha$

(C) $1 + \alpha$

(D) $1 + 2\alpha$

49. Which of the following is the structure of pyrosulphuric acid?

(A) $HOO - S(=O)_2 - OH$

(B) $HO - S(=O)_2 - O - O - S(=O)_2 - OH$

(C) $O^- - S(=O)_2 - OH$

(D) $HO - S(=O)_2 - O - S(=O)_2 - OH$

50. Peroxide ion is

(A) Paramagnetic

(B) Ferromagnetic

(C) Diamagnetic

(D) Antiferromagnetic

51. How many isomers can a compound with molecular formula C_3H_5Br have?

(A) 2

(B) 3

(C) 4

(D) 5

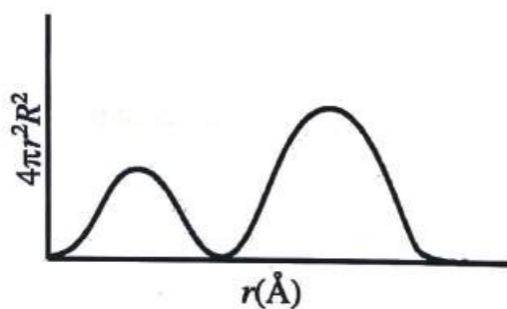
52. Which one of the following cations gives a chocolate brown precipitate upon addition of aqueous solution of $K_4[Fe(CN)_6]$?

- (A) Fe^{3+}
 - (B) Cu^{2+}
 - (C) Zn^{2+}
 - (D) Ca^{2+}
-

53. A compound contains two types of atoms A and B. Its crystal structure is a cubic lattice with 'A' atoms at the corner of the unit cells and 'B' atoms at the body centres. The simplest formula of the compound will be

- (A) A_2B
 - (B) AB
 - (C) AB_2
 - (D) AB_3
-

54. The plot of radial probability density ($4\pi r^2 R^2$) against r for an electron in np orbital of a many electron atom is given below. The value of n is



- (A) 2
 - (B) 3
 - (C) 4
 - (D) 5
-

55. A buffer solution contains 100ml of 0.01(M) CH_3COOH and 200ml of 0.02(M) CH_3COONa . 700ml of water is added subsequently to the buffer solution. The pH before and after dilution

are [given, $pK_a = 4.74$; $\log 2 = 0.301$]

- (A) 5.04, 5.04
 - (B) 5.04, 0.504
 - (C) 5.04, 1.54
 - (D) 5.34, 5.34
-

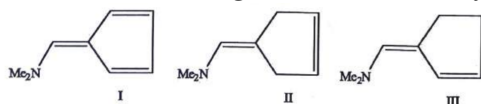
56. The correct order of conductivity of 0.001 (M) separate aqueous solutions of $[Pt(NH_3)_6]Cl_4$ (i); $[Cr(NH_3)_6]Cl_3$ (ii); $[Co(NH_3)_4Cl_2]Cl$ (iii) and K_2PtCl_6 (iv) each containing octahedral complex species is

- (A) (i) < (ii) < (iii) < (iv)
 - (B) (i) < (ii) < (iv) < (iii)
 - (C) (i) < (iv) < (iii) < (ii)
 - (D) (iii) < (iv) < (ii) < (i)
-

57. Borazole is prepared by heating the product isolated by reacting

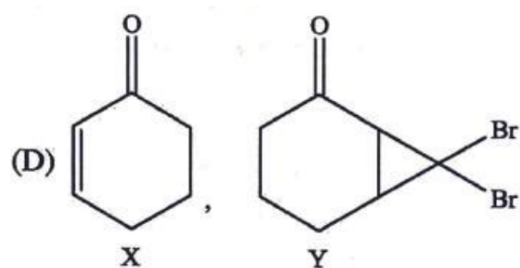
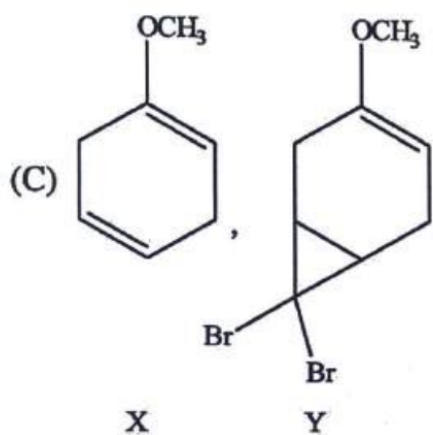
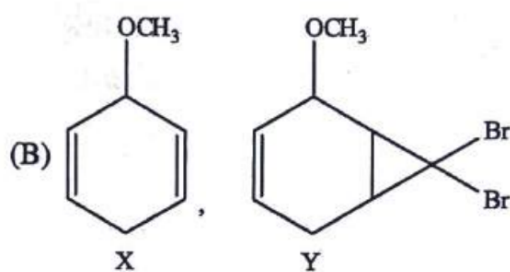
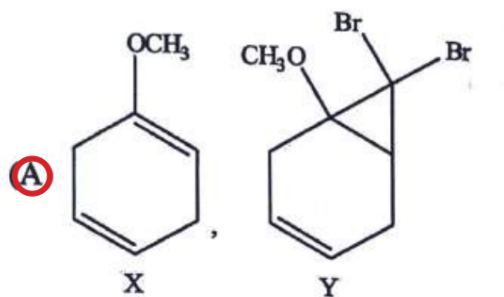
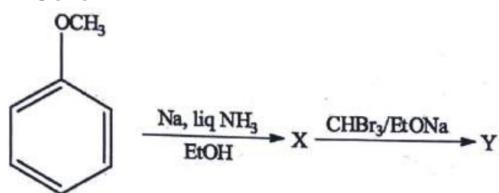
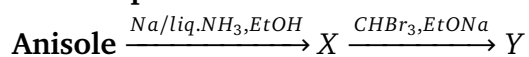
- (A) boron with dinitrogen.
 - (B) diborane with ammonium nitrate.
 - (C) diborane with ammonia.
 - (D) boron with ammonia.
-

58. The increasing order of basicity of the following compounds is



- (A) I < III < II
 - (B) III < I < II
 - (C) II < I < III
 - (D) II < III < I
-

59. The products X and Y in the following reaction sequence are



(A) Fig A

(B) Fig B

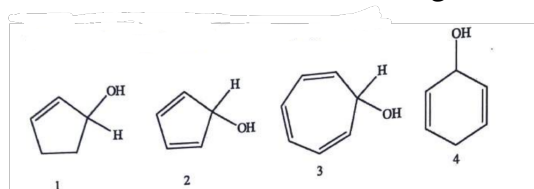
(C) Fig C

(D) Fig D

60. The van der Waal's equation : $[P + a/(4V^2)][V - b/2] = RT/2$ is valid for

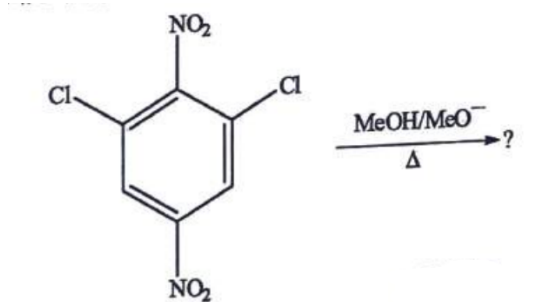
- (A) 1 mole of an ideal gas.
- (B) 2 moles of a real gas.
- (C) 1/2 mole of an ideal gas.
- (D) 1/2 mole of a real gas.

61. Which one of the following does not lose water even in conc. H_2SO_4 ?



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

62. The major product in the following reaction is: 1,3-dichloro-2,5-dinitrobenzene is treated with methoxide ion (MeO^-) in methanol ($MeOH$) under heating.

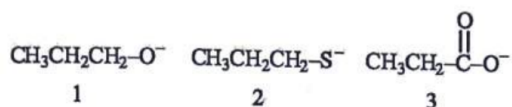




- (A) A
(B) B
(C) C
(D) D

63. Rank the following anions in order of decreasing nucleophilicity in a polar protic solvent (most $\rightarrow$ least nucleophilic).

1. $\text{CH}_3\text{CH}_2\text{CH}_2-\text{O}^-$ (propoxide)
2. $\text{CH}_3\text{CH}_2\text{CH}_2-\text{S}^-$ (propanethiolate)
3. $\text{CH}_3\text{CH}_2-\text{C}(=\text{O})-\text{O}^-$ (propanoate)



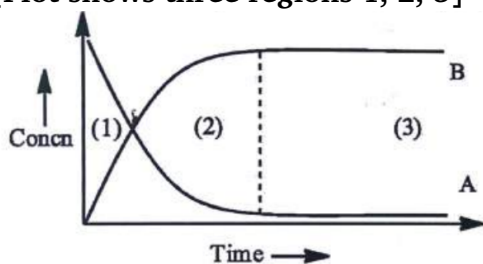
- (A) $3 > 2 > 1$
(B) $2 > 3 > 1$
(C) $1 > 3 > 2$
(D) $2 > 1 > 3$

64. In which of the following species, sp^3d^2 hybridisation is not associated?

- (A) XeF_6
(B) BrF_5^+
(C) IF_5
(D) XeF_4

65. For the reaction $A \rightleftharpoons B$, variation of concentration is plotted against time as shown below.

[Plot shows three regions 1, 2, 3]

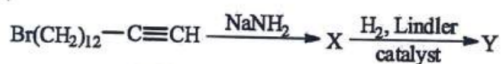


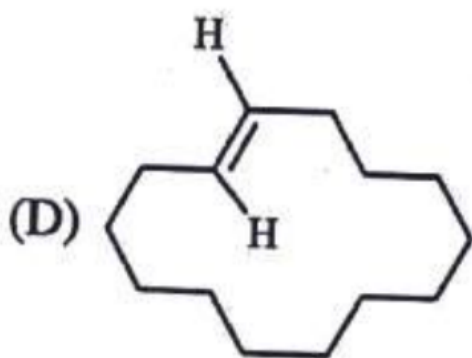
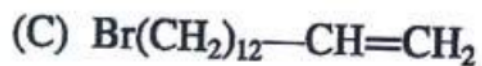
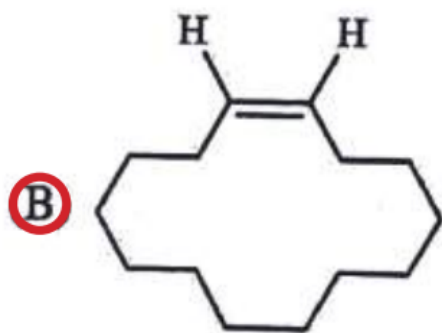
- (A) Region (1) indicates equilibrium
- (B) Region (2) indicates equilibrium
- (C) Region (3) indicates equilibrium
- (D) Both the Regions (2) and (3) indicate equilibrium

66. In a first order reaction, the concentration of reactant decreases from 400 moles lit^{-1} to 50 moles lit^{-1} in 7.5×10^3 s. The rate constant of the reaction is (approximately)

- (A) $1 \times 10^{-2} s^{-1}$
- (B) $2.5 \times 10^{-3} s^{-1}$
- (C) $1 \times 10^{-5} s^{-1}$
- (D) $2.77 \times 10^{-4} s^{-1}$

67. In the following reaction sequence, the product Y is: $Br(CH_2)_{12}-C \equiv CH \xrightarrow{NaNH_2} X \xrightarrow{H_2/Lindlar's catalyst} Y$



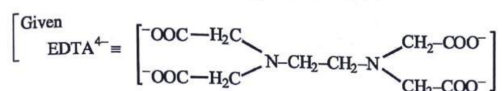


- (A) Fig A
(B) Fig B
(C) Fig C
(D) Fig D

68. The mass of an electron is 9.1×10^{-31} kg. If its K.E. is 3.0×10^{-25} J, its wavelength is (approximately)

- (A) 250 nm
(B) 990 nm
(C) 400 nm
(D) 850 nm

69. The calculated magnetic moment for low spin $[\text{Ru}(\text{EDTA})]^-$ is



- (A) 2.73 BM
(B) 1.73 BM
(C) 3.23 BM
(D) 0.00 BM

70. Glucose is added to 1 litre of water to such an extent that $\Delta T_f / K_f$ equals to 1/1000. The weight of glucose added is

- (A) 180 gm
(B) 18 gm
(C) 1.8 gm
(D) 0.18 gm

71. A 5.0 cm^3 solution of H_2O_2 liberates 1.27 g of iodine from an acidified KI solution. The percentage strength of H_2O_2 is close to

- (A) 11.2
(B) 5.8
(C) 1.9
(D) 3.4

72. An organic compound undergoes first order decomposition. The time taken for its decomposition to 1/8th and 1/10th of its initial concentration are $t_{1/8}$ and $t_{1/10}$ respectively. The value of $\left[\frac{t_{1/8}}{t_{1/10}} \right]$ is [Given $\log_{10} 2 = 0.3$]

- (A) 0.9
(B) 0.6
(C) 0.3
(D) 0.5

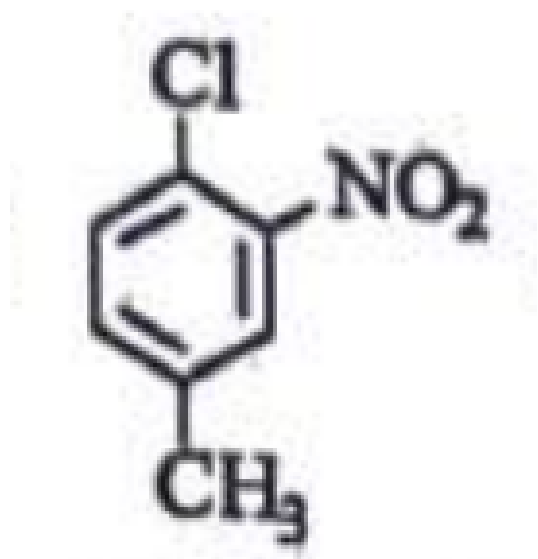
73. For the metal complex $[Co(NH_3)_5SO_4]Br$, coordination number, oxidation number, number of d-electrons and number of unpaired d-electrons are respectively

- (A) 6, 3, 6, 0
 - (B) 7, 2, 6, 2
 - (C) 6, 2, 6, 0
 - (D) 6, 2, 7, 0
-

74. $RO-CH_2-C \equiv CH \xrightarrow{X} \xrightarrow{Y} RO-CH_2-C \equiv C-CH_2CH_2-Br$. To carry out the above conversion X and Y are respectively

- (A) $NaNH_2, Br-CH_2-CH_2-Cl$
 - (B) $NaNH_2, I-CH_2-CH_2-Br$
 - (C) $NaNH_2, F-CH_2-CH_2-Br$
 - (D) $NaNH_2, CH_2=CH-Br$
-

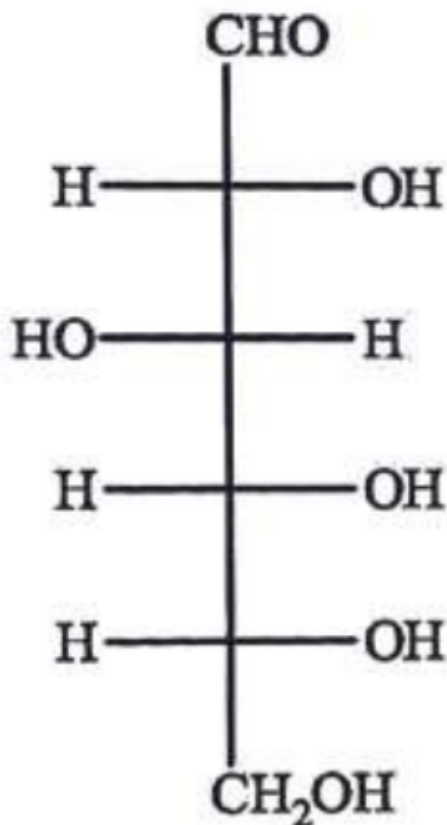
75. The IUPAC name of the given compound is [Image shows benzene with Cl, NO₂, and CH₃ substituents]



- (A) 1-Chloro-2-nitro-4-methylbenzene
- (B) 1-Chloro-4-methyl-2-nitrobenzene

- (C) 2-Chloro-1-nitro-5-methylbenzene
(D) m-Nitro-p-chlorotoluene
-

76. Which of the following statement(s) is/are correct about the given compound? [Image shows D-glucose]



- (A) It exhibits ring-chain tautomerism.
(B) It forms osazone with phenylhydrazine.
(C) It gives eight (8) stereoisomers.
(D) It responds to Tollen's reagent.
-

77. 1 mole of an ideal gas undergoes the following processes:

Process A $\rightarrow$ Isothermal expansion at 400K from volume V_1 to volume V_2 , such that $V_2 = 4V_1$.

Process B $\rightarrow$ Adiabatic expansion from volume V_1 to volume V_2 , such that $V_2 = 4V_1$.

Consider the following statements and select the correct one/s.

- (A) Work done by gas in Process A is greater than in Process B.
(B) Final temperature in Process B is less than 400K.
-

- (C) Change in internal energy is 0 in Process A but non-zero in Process B.
(D) Heat absorbed by the gas is positive in Process A but zero in Process B.
-

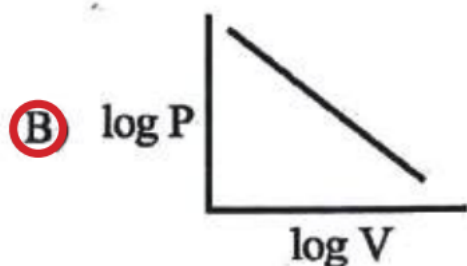
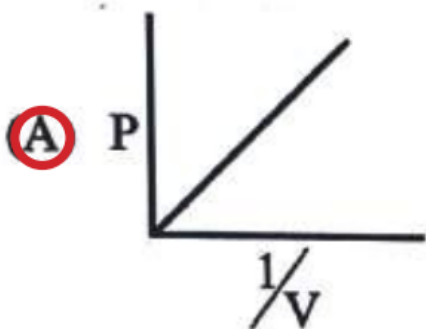
78. Which of the following statement(s) is/are correct?

- (A) Starch is composed of repeating α -D-glucose units.
(B) Nylon-6 is an addition polymer whereas nylon-6,6 is a condensation polymer.
(C) Isoprene is the monomer unit of natural rubber.
(D) Bakelite is obtained from reaction between phenol and acetaldehyde.
-

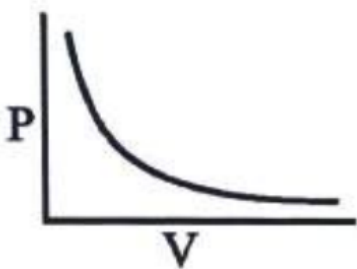
79. Which of the following have tetrahedral structures?

- (A) $[Ni(CN)_4]^{2-}$
(B) $[Ni(CO)_4]$
(C) $[NiCl_4]^{2-}$
(D) CrO_4^{2-}
-

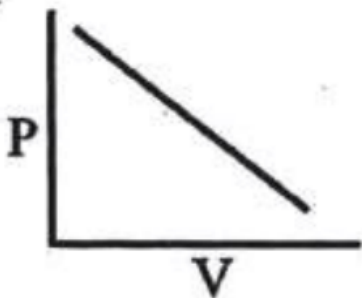
80. Which of the following plot(s) is/are correct representation(s) of Boyle's Law?



(C)



(D)



- (A) Plot of P vs $1/V$ (Straight line through origin)
(B) Plot of $\log P$ vs $\log V$ (Straight line with slope -1)
(C) Plot of P vs V (Rectangular Hyperbola)
(D) Plot of P vs V (Straight line with negative slope)
-