SINCE 1984

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STUDY CENTRE, PALA

# KEAM 2025

# DAY-5

SCAN ME

# VIDEO SOLUTION

# MEMORY BASED QUESTIONS

1. For an ideal gas of molar mass M, the slope of the graph between the rms speed V and $\sqrt{T}$ where T represents the temperature is .....

2. A white light is passed through a prism and split into its constituent colours. Which colour deviates the most?

3. The tennis ball of mass 120g moving with a velocity of $20ms^{-1}$ towards gets by a rocket of velocity and the final speed becomes $30ms^{-1}$ with direction reversed. If the time of contact is 0.01s, What is the average force acting on the ball.

4. If force is 500N and instantaneous velocity is 20m/s. What is the instantaneous power?

5. What is the dimension of $\frac{MK}{BT}$ where

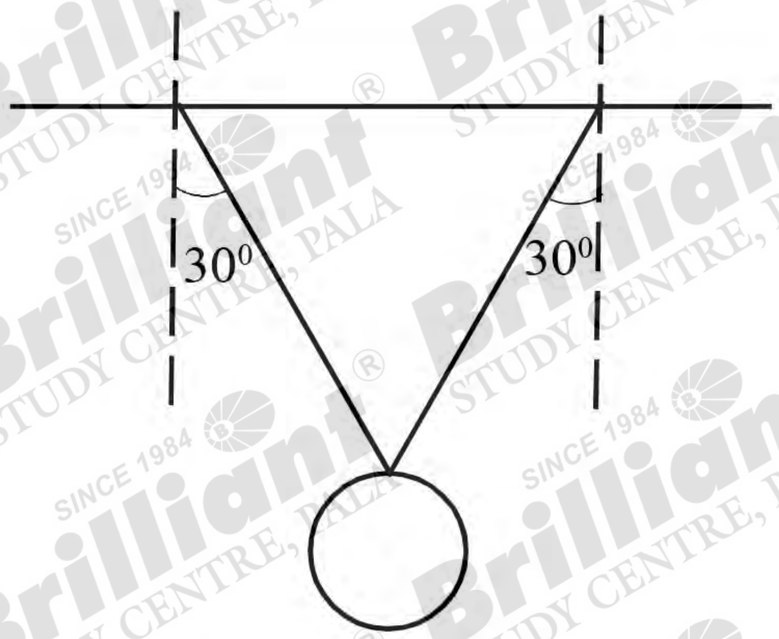
   M represents magnetic moment

   K represent Boltzman constant

   B represents magnetic filed and

   T represents temperature

6. What is the tension in the string if the mass of the bob is $10\sqrt{3}kg$?




7. Galvanometer can be converted into a voltmeter by connecting.....

8. Wheatstone bridge is used to measure

   A) Voltage  B) Resistance  C) Current

9. ${}^{197}_{96}X \rightarrow {}^{197}_{95}Y + Z + V$ what is Z?

10. The position of body varies as $S = 9t^2 - 6t$. What is the time at which the body becomes at rest?

11. What is the ratio of de Broglie wavelength of the particles if their kinetic energy are 0.002eV and 2eV respectively?

12. The temperature of source and sink of a heat engine are $127^0$C and $27^0$C respectively. By how much should the temperature of the source be increased so as to double the efficiency?

13. Electric field lines around a positive charge are directed.....

14. Electric field inside a uniformly charged shell is .....

15. According to Huygen's principle, secondary wavelets moves .....

16. A rod of length 0.5m moves with a velocity of $3ms^{-1}$ in a perpendicular magnetic field of strength 2T. Find the emf induced across its ends.

17. The torque experienced by a dipole of dipole moment $\vec{P}$ in a uniform electric field of strength $\vec{E}$ is given by

A) $\vec{P} + \vec{E}$ B) $\vec{P} \times \vec{E}$ C) $\vec{P} - \vec{E}$ D) $\vec{P}.\vec{E}$

18. A guitar string is vibrating in the third harmonic. The number of nodes and antinodes present are :

19. If n cells of emf E and internal resistance r are connected in parallel. What is the equivalent emf and internal resistance of the combination?

20. Coefficient of friction is the ratio of :

21. A block is tied to a string of length 98 cm is rotated in a horizontal circle. Find the angular velocity if the centripetal acceleration a = g

22. What is the potential energy of an object of mass m placed on the surface of earth? (Mass of earth = M, radius of earth = R)

23. What is the magnetic moment of a current carrying loop which carries a current i, has n loops and area A?

24. The acceleration of a particle varies with time as a = 6t. What is the displacement and velocity of the particle at t = 4s?

25. For diffraction of occur, the size of the slit shold be -----

26. How does the resistance of semiconductor vary with temperature?

27. What is the ration Cp/Cv of a diatomic gas?

28. The centre of mass of a rod of length l is at a distance ------ from one end of the rod.

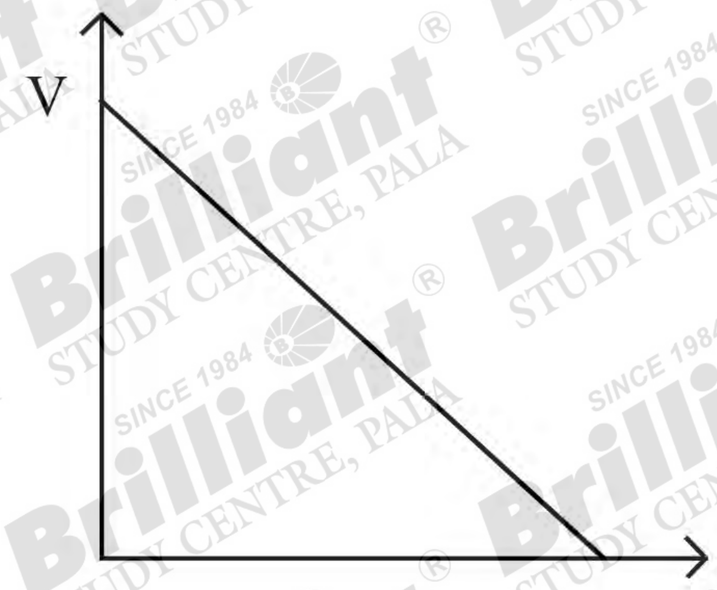
29. When a rotating disc suddenly shrinks in radius, what happens to the angular velocity w?

30. Water flows through a pipe with velocity $V_1 = 3ms^{-1}$ where the area of the pipe is $a_1$. What is the velocity $V_2$, where the diameter of the pipe is half of that at area $a_1$?

31. What is the dimension of surface tension?

32. What is the ratio of orbital velocity and escape velocity?

33.




Which of the following statement is correct?

A) at t = 0, acceleration is decreasing

B) at t = 0, acceleration is increasing

C) at t = 0, body is not rest

D) at t = 0, velocity is maximum

34. In an N type semiconductor, doner level is

A) above the valance band

B) Below the conduction band

C) In valance band

D) In conduction band

35. What happens to the pressure as we go deep inside the water?

36. What is the resistance in terms of resistivity of a steel wire of length 2km and area of cross section $20cm^2$?

37. What is angle of contact?

38. Line integral of magnetic field over a closed loop is-----

39. Speed of EM wave depends on:

40. The graph of kinetic energy versus work function is:

27-04-2025

# DAY-5

## MEMORY BASED QUESTIONS

## CHEMISTRY

1. Solvent in wurtz reaction
2. Find Ksp of the salt $X_3Y_2$ is s is the solubility
3. Nitrogen base not present in DNA
   A) uracil B) Guamine C) Adenine D) Thymine E) Cyclosine
4. Propene on reactionwith $B_2H_6$ followed by treating with NaOH, $H_2O_2$ gives
5. The total number of orbitals when n = 3
6. A first order reaction is 75% completed in 6000s. What is the half life
   A) 50 minutes B) 45 minutes C) 60minutes D) 20 minutes E) 100 minutes
7. Alkali metal with highest first ionization enthalpy is
   A) Li B) Na C) K D) Rb E) Ls
8. Benzene when treated with $Br_2$ in presence of $FeBr_3$ gives 1,4 - dibromobenzene and 1,2 - dibromobenzene which type of reaction is this
   A) nucleophilc substitution B) Nucleophilic addition
   C) Electrophilic substitution D) Electrophilic addition
   E) Free radical substitution
9. Name of the reaction in which benzoyl chloride is converted to benzaldehyde is
10. Which of the following contain 2 primary –OH groups in its structure
    A) Glycerol B) Ethylene glycol C) Isopropyl alcohol
11. Number of valence of electrons in Germanium
12. Molecule with $2\sigma$ and $2\pi$ bonds?
    A) $CO_2$ B) CO C) $H_2$ D) $Cl_2$ E) $F_2$
13. Maximum magnetic moment shown by
    A) $Mn^{2+}$ B) $Fe^{2+}$ C) $Cr^{3+}$ D) $Ni^{2+}$ E) $CO^{2+}$
14. Relation between Azimuthal quantum number and magnetic quandum number

16. Which is least basic?

a) $CH_3NH_2$ b) $CH_3CH_2NH_2$ c) 


d) 


e) $CH_3-NH-CH_3$

17. The element with highest melting point among the given transition element
    a) Cr b) w C) Mo
18. The most basic oxide
    a) $Cr_2O_3$ b) CrO C) $Mn_2O_7$ D) $V_2O_5$
19. $E^{o}Cell = 1.1eV$. Find $E_{cell}$
    $Zn + Cu^{2+}(0.1M) \rightarrow Zn^{2+}(0.001M) + Cu$
20. Homologue of $C_2H_4$ with molar mass 56

21. Given that kinetic energy of two electron are 0.02eV and 2eV. Ratio of de - Broglie wave length

22. Find the $\Delta u$ during the reaction $H_2O_{(\ell)} \rightleftharpoons H_2O_{(g)}$ $\Delta S = +1kJ/mol$ at 100°C?

23. Friedal craft's reaction is an example of

24.

| [A] | [D] | Rate |
|---|---|---|
| 0.10 | 0.2 | 0.2 |
| 0.2 | 0.2 | 0.4 |
| 0.10 | 0.1 | 0.05 |

product the rate law

25. Which of the following has maximum conductivity
a) $[Co(NH_3)_3Cl_3[$ b) trans$[Co(NH_3)_4Cl_2]Cl$
c) $[Co(NH_3)_5Cl]Cl_2$ d) trans $[Co(NH_3)_4Cl_2]Cl$ e) $[Co(NH_3)_6Cl_3]$

26. In which of the following Kc = Kp
a) $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$
b) $H_2(g) + I_2(g) \rightarrow 2HI(g)$

27. Pressure of pure benzene is 0.75. When 0.2g of a non volatile solute is added to 39g of benzene, pressure changes to 0.745. The molar mass of solute is

28. 10g of (90% pure) $CaCO_3$ treated with excess of HCl mass of $CO_2$ produced is?

29. Which of the following is an ambidentate legand
a) $C_2O_4^{2-}$ b) $CN^-$ c) $NH_3$

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## MEMORY BASED QUESTIONS

## MATHEMATICS

1. $\sec\left[\cos^{-1}\frac{2024}{2025}\right] =$

2. $\int\left(\sin^{-1}\sqrt{x}+\cos^{-1}\sqrt{x}\right)dx =$

3. Axis of prabola is x = 0. If vertex at a distance 3 from origin above the x-axis. Find vertex

4. $\frac{\sin\frac{\pi}{7}+\cos\frac{\pi}{7}}{1+\cos\frac{\pi}{7}+\cos\frac{2\pi}{7}} =$

5. If $f(x) = \left|x^2-3x+2\right|$, then f(x) is not differentiable at ———

6. |A| = 9, where A is a matrix of order 3, find |dj (adjA) |

7. $\cos 75^0, \cos 15^0, \cos 45^0 =$

8. $\lim_{x\to 0}\frac{\sin\left(\pi\sin^2 x\right)}{x^2} =$

9. Find the probability og getting atmost 2 heads when 4 coins are tossed.

10. $\int\frac{\cos\theta}{2-\sin^2\theta}d\theta =$

11. $a_1, a_2, a_3$ ------ $a_n$ are the real numbers $a_1$ $a_1\times a_2\times a_3.....\times a_n = k$, Minimum value of $a_1 + a_2 + .....a_n$ is ———

12. $\lim_{x\to\bar{o}}\frac{\sin[x]}{[x]}$, where [.] represents greatest integer function

13. $x+\frac{x}{4}+\frac{x}{3}<13$, then $x\in$

14. Integrating factor of $\frac{dy}{dx}-2y = 2x-3$

15. Coefficient of $x^9$ in $\left(4-\frac{x^2}{9}\right)^{12}$

16. $a, \frac{3}{4}, ar^2, ar^3$ are in G.P. Product of first four terms = $\frac{3^6}{4^3}$, then a =

17. x – y + 4 = 0 touches ellipse at $x^2 + 3y^2 = 12$ at ——— point

18. Equation of straight line through (1, –1, 0) and parallel to the line $\frac{x-1}{1}=\frac{y+1}{1}=\frac{z-1}{-1}$

19. $\vec{a}\times\left(2\hat{i}+3\hat{j}+4\hat{k}\right)=\left(2\hat{i}+3\hat{j}+4\hat{k}\right)\times\vec{b}$, $\left|\vec{a}+\vec{b}\right|=\sqrt{29}$, $\vec{a}.\vec{b}=$

20. $\int_3^5 \frac{1}{x(x+1)}dx=$

21. Equation of line through (0, 0,1) and (1, 1,0)

22. $(a-2)^2+(b-2)^2+(c-2)^2=0$, then $a+b+c=$

23. $\int \frac{\sin 2x}{\sin x}dx$

24. Range of $f(x)=\log_e(4x^2-4x+1)$

25. $\lim\limits_{x\to 2}\frac{\left(x^3-8\right)\sin(x-2)}{x^2-4x+4}=$

26. No of integers greater than 7000 using 2, 4, 6, 7, 8 without repetation

27. Variance of 240, 260, 270, 280

28. $\int_{-3}^{3}[x]\,dx=$

29. $\int \frac{\log(1+x)}{(1+x)}dx=$

30. Length of latus rectum of ellips $\frac{x^2}{9}+\frac{y^2}{16}=1$

31. Centre of ellipse $4x^2+24x+9y^2-18y+9=0$

32. Min of $f(x)=|x+2|$ is at $x=$ _____

33. $g(x)=x^2-x$, $g(x)$ is increasing in which internval?

34. $\int_{\frac{-\pi}{2}}^{\frac{\pi}{2}}\left(x^4+x^3+x\right)\cos x\,dx=$

35. Mean deviation mean of

| x | 2 | 4 | 6 | 10 |
|---|---|---|---|---|
| f | 7 | 4 | 5 | 4 |

36. $P(A)=0.7$, $P(B)=0.5$, $P(\left(A\cup B\right)=0.9$ . Find $P(A/B)=$

37. $f(x)=x|x|$, find $f'(-10)=$

38. $f(x)=\sin(|x|)-|x|$ is not differentiable at $x=$ _____

39. $\sum_{n=1}^{2025} i^n(1+i)=$ _____

40. $\int e^x\left[\frac{1}{1+x}-\frac{1}{(1+x)^2}\right]dx=$

41. Solution set of $-12x > 38$ for $x \in N$

42. $\alpha+\beta+\gamma = 2\pi$, then $\tan\frac{\alpha}{2}+\tan\frac{\beta}{2}+\tan\frac{\gamma}{2}$ is equal to

43. $\begin{vmatrix} 1 & 0 & 0 \\ x & x+3 & 1 \\ x^2 & 0 & x+2 \end{vmatrix} = 0$ find x

44. Maximum value of $f(x) = x\sqrt{4x-x^2}$

45. If $A = \{1, 2, 3, 4\}$, $B = \{8, 7, 3, 4\}$ find number of common elements in $A \times B$ and $B \times A$

46. $\sec^{-1}\left(\frac{x}{x+2}\right) = \frac{\pi}{2} - \operatorname{cosec}^{-1}\frac{1}{2}$, find x?

47. $\frac{x-1}{2} = \frac{y-3}{a} = \frac{z-4}{3}$ and $\frac{x-5}{5} = \frac{y-2}{4} = \frac{z-5}{8}$ are perpendicular lines, then find a

48. $x+iy = -(6+i)^3$ then $x - y =$

49. $\tan^{-1}\left(\frac{1001}{999}\right) - \tan^{-1}\left(\frac{2}{2000}\right) =$

50. If $Z = x + iy$, $|Z-i| = |Z-1|$ then $y =$

(A) $x + 1$ B) $x$ C) $-x-1$ D) $-x$ E) $-x+2$