SINCE 1984

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STUDY CENTRE, PALA

KEAM 2026

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VIDEO SOLUTION

SCAN ME

MEMORY BASED QUESTIONS

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MEMORY BASED QUESTIONS

CHEMISTRY

1. What is the IUPAC name of Mesityl oxide?

2. IUPAC name of Element number 105?

3. What is 1-chlorocyclohexene?

   A) Vinylic Halide B) Benzylic halide

   C) Allylic halide

4. Decreasing order basic strength

   A) $NH_3 > CH_3NH_2 > (CH_3)_2 NH_2 > (CH_3)_3 NH_2$

   B) $(CH_3)_2 NH_2 > CH_3NH_2 > (CH_3)_2 NH_2 > NH_3$

   C) $CH_3NH_2 > (CH_3)_2 NH_2 > (CH_3)_3 NH_2 > NH_3$

5. The KE of particle of mass 1×10^{-31} Kg and the de Broglie wavelength 63 nm $\left(h = 6.3\times10^{-34}\right)$

6. Which of the following have minimum and maximum threshold energy K, Na, Mg, Li

7. Number of C– C, C – H, C = C in But-2-ene-1-yne respectively

8. There is 40 % C, 67% H_2, find the empirical formula

9. Energy of $2h\upsilon_0$ fall on a metal of work function $h\upsilon_0$ cause velocity of v_1, when $5h\upsilon_0$ fall velocity ratio of v_1/v_2

10. The isomerism shown by the following compound

    $\left[Co(CN)_6\right]\left[Cr(NH_3)_6\right]$

    $\left[Co(CN)_6\right]\left[Cr(NH_3)_6\right]$

    A) Ionisation isomerism B) Coordinate isomerism

    C) Linkage isomerism D) Hydrate isomerism

11. $P_4 \rightarrow PH_3 + H_2PO_2^-$

    Oxidations state of phosphorous change from ------- to and ----- respectively

12. Which 3d series of element has least enthalpy of atomization?

    A) Sc B) Mn

    C) V D) Cu E) Zn

13. Ratio of between the maximum wavelength of Lyman and Balmer series

A) $\frac{5}{27}$ B) $\frac{27}{5}$

C) $\frac{4}{3}$ D) $\frac{36}{5}$ E) $\frac{5}{36}$

14. The Kc of the reaction $NH_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$ at 1500 K is 0.1. What is the concentration of NO, when initial concentration of N_2 and O_2 is 0.04 mol

A) 1.09×10^{-2} M B) 10.9×10^{-2} M

C) 2.18×10^{-2} M D) 1.09×10^{-4} M E) 2.18×10^{-4} M

15. Which reagent gives 

as major product from phenol

A) $Br_2 + Cs_2$, at 273 K B) Br_2 + heat

C) Bromine water D) $Br_2 + CCl_4$ at 273 K

E) Br_2 + acetone at 273 K

16. Hinsberg reagent is

A) p-toluene sulphonyl chloride

B) Benzene sulphonyl chloride

C) Phthalimide and KOH

D) Anhydrous ZnCl2 and conc HCl

E) Benzoyl chloride and NaOH

17. If 'm' is the molality, 'M' is the molarity, 'd' is the density in g/cm^3 and 'M_2' is the molarity of solute. What is the relation between them?

18. Which of the following has highest pKa value

A) CH_3COOH B) $F-CH_2-COOH$

C) $CN-CH_2-COOH$ D) $Cl-CH_2-COOH$

E) NO_2-CH_2-COOH

19. Which of the following statements regarding the structure of CO_2 is correct

A) CO_2 contains 1 C–O and 1 C = O and one lone pair in each oxygen

B) CO_2 contains 2 C = O, and 2 lone pair in each oxygen

C) CO_2 contains 2 C – O, and 2 lone pair in each oxygen

D) CO_2 contains 1 C = O, and 1 C = O and two lone pairs in each oxygen atom

E) None of these

20. Which of the following has planar structure with two lone pair?

A) XeF_4 B) NiF_4 C) SF_4 D) SF_6 C) XeF_4

21. Lactose is composed of

A) $\alpha - D$ glucose and $\beta - D$ fructose

B) $\beta - D$ glucose and $B - D$ galactose

C) 2 units of $\alpha - D$ glucose

D) 2 units of $\beta - D$ glucose

E) $\alpha - D$ glucose and $\beta - D$ galactose

22. Which of the following is allylic alcohol

A) $C_6H_5 - CH_2OH$

B) $CH_2 = CH - C(CH_3)_2 - OH$

C) $CH_2 = CH - CH_2 - CH_2 - OH$

D) $CH_3 - CH_2 - CH_2 - OH$

E) $CH_3 - CH_2 - CH_2 - CH = CH - OH$

23. Relationship between t_{90} and t_{99} for a first order reaction

A) $t_{99} = 3t_{90}$ B) $t_{99} = 2t_{90}$

C) $t_{99} = 2.303t_{90}$ D) $t_{99} = 20.693t_{90}$

E) $t_{99} = 6.93t_{90}$

24. Enthalpy of formation of $C_6H_{6(l)}$, $CO_{2(g)}$ and $H_2O_{(l)}$ are -393.5, –285.8 and +48.5 KJ/mol resopectively. Find the enthalpy of combustion of $C_6H_{6(l)}$

A) 3267.4 KJ / mol B) 3218.49 KJ / mol

C) 857.5 KJ / mol D) 2361 KJ / mol E) 2361 KJ / mol

25. Increasing order of metallic character

A) Na > Mg > Be > Si > P B) Na > Be > P > Si > Mg

C) Mg > Be > P > Si > Na D) P > Si > Be > Mg > Na

E) Mg > Si > Be > Na > P

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MATHEMATICS

1. (3, –4) and (4, –a) lie on line find a?

2. If $y = 4\sqrt{x}$ then $\frac{d^2y}{dx^2} =$

3. The range of the function $f(x) = \frac{1}{7 + 4\sin x + 3\cos x}$

4. Number of words that can be formed starting and ending with the same letter from the word BANANA.

5. Number of ways 3 boys and 4 girls can be arranged such that there is one girl b/w any 2 boys and one boy b/w any 2 girls

6. If $y = \frac{1+\tan^2 x}{1-\tan^2 x}$, find $y'\left(\frac{\pi}{8}\right)$ where $0 < x < \frac{\pi}{4}$

7. If $\alpha - = \frac{\pi}{4}$ find $(\sin\alpha + \sin\beta)^2 + (\cos\alpha + \cos\beta)^2$

8. If $y = \log_e\left(x^3 + 24\right)$ find $\frac{dy}{dx}$ $\frac{dy}{dx}$ at $y = \log_e 2$

9. $\int_{-1}^{1} \frac{\log(1+|x|)}{1+|x|}\,dx =$

10. Find unit vector parallel to $-(s+4s)\,\hat{i} + (7-2s)\,\hat{j} + (3+4s)\,\hat{k}$

11. $\int (\cot 2x + \operatorname{cosec} 2x)\,dx$

12. $\int \frac{\sqrt{x}+1}{\sqrt{x}}$

13. Solve $6(2x+3) + x > 53 - 2x$

14. $\int \frac{x^2+6x+1}{(x+3)^2}dx$

15. $\lim_{x\to 0} \frac{1-\sec^2(\alpha x)}{\alpha x^2} = -3$, find α ?

16. The distance of the point (10, 10, 10) from Z - axis

17. $\int_0^{p/2} \sqrt{\cos x \sin 2x}\, dx$

18. Find minimum value of sinx sin $\left(x+\frac{\pi}{3}\right)$

19. Find the 1F of $2dy = (y + \cos x)\, dx$

20. If the area of the circle $x^2 + y^2 + 8x - 6y + c = 0$

21. If $n(B) = 61$

$n(A \cup B) = 99$

$n(n(A \cap B) = 28$ Find $n(A^1)$

22. $\vec{a} = 2\hat{i} - \lambda\hat{j} + 5\hat{k}, \vec{b} = \mu\hat{i} + 7\hat{j} + 3\hat{k}$ midpoint of AB $= 3\hat{i} + 2\hat{j} + 4\hat{k}$. Find $\lambda + \mu$?

23. $\alpha^2 - \frac{1}{\alpha^2} = 2$ find $\left(\alpha + \frac{1}{\alpha}\right)^{16} =$

24. Maximum of $f(x) = \alpha - 4x - x^2$ is 1 find α = ?

25. $(2 - x)^9 = a_0 + a_1x + ...+ a_9x^9$ find $a_1 + a_2 + ... a_8 =$

26. $y = 4e^{-x} - 2e^{-2x} - e^{-3x}$ $y^{//} = ?$

27. $a_1 + a_2 + a_3 + a_4 = 960$ $a_4 - 8a$. Find a_1

28. $\lim_{x \to 0} \frac{x - \tan 3x}{\sin 2x} = ?$

29. $y = \frac{1}{1 + \tan x}$ Find $f^{-1}(x)$ $0 < x < \frac{\pi}{2}$

30. Arithmetic mean & Geometric mean of 2 numbers a & b in the ratio 5:3 Find $\frac{a^2 + b^2}{ab}$

31. $\int \frac{x\cos 2x}{\cos x - \sin x}$

32. If 2 vectors $4\hat{i} + \ell\hat{j} - 6\hat{k}$ and $-6\hat{i} + 12\hat{j} + 9\hat{k}$ and collinear. Find λ

33. 4, 7, x, 13, 16. If mean = 10 find mean deviation about mean

34. $(3\cos x - 2\sec)^2 = 9\cos^2 x + 4\tan^2 x + k$ find k?

35. $\lim_{x\to 1} \frac{\left(\sqrt{x+3}\right)\sqrt{x} - 1}{x - 1}$

36. Coefficient of x^3 in $(2 + x)$ is 160 find coefficient of x^6 in $(2 - x^2)^n$

37. If $f(x) = x^2 - 10x$, $g(x) = e^x + 5$ find $g(2x) - fog(x)$

38. Max of $Z = 7x + 10y$ subject to $x + y \geq 3$, $x + 2y \geq 4$, $x, y \geq 0$

39. If $\left|\vec{a} - \vec{b}\right| = \frac{\sqrt{3}}{2}$ where $\vec{a}$ and $\vec{b}$ are unit vectors. find angle between $\vec{a}$ and $\vec{b}$

40. Find the value of $\cot 10^0 \times \cot 30^0 \times \cot 45^0 \times \cot 60^0 \times \cot 80^0$

41. If $2\cot^{-1}\left(\frac{4}{3}\right) = \cos^{-1}\left(\frac{x}{5}\right)$ find x?

42. Find locus of $Z = x + iy$ satisfying $\frac{\mathrm{Re}(z)}{2+i} + \frac{\mathrm{Im}(z)}{1+2i} = \frac{3}{1-2i}$

43. Find equation of curve (x, y) if $\cos^{-1}(x-2) = \sin^{-1}(y+1)$

44. If sum of first two terms of G.P is 12 and third term is 16. Find r?

45. $y = \frac{1}{3\sqrt{x}}\left(\frac{2}{x} - 3\right)$. The interval in which y is strictly decreasing

46. If $Z = 1 + i$ and $Z - \frac{24\bar{Z}}{Z^2} = \lambda z$ find λ

1. In YDSE, when light of wavelength 700nm is used , a fringe width of 0.5mm is obtained. What happens when light of wavelength 500nm is used.
2. When light containing photon of energy $2h\upsilon_0$ falls on a metal of work function $h\upsilon_0$, electrons of velocity v_1 are ejected. When photons of energy $5h\upsilon_0$ is incident, velocity of electrons ejected is v_2. What is $\frac{v_1}{v_2}$
3. Consider a convex lens made of material of refractive index $n = \frac{3}{2}$ abd radius of curvature R. What is the relation between focal length and radius
4. Kinetic energy of particle of mass 1×10^{31}kg and wavelength 63nm $\left(h = 6.3\times10^{-34}\right)$
5. Dimension of plank's constant is same as that of
   A) energy B) linear momentum C) angular momentum
6. What is the number of significant figures in 420.00040×10^{-3}
7. Two metallic spheres of radii 1:2 are conneted by a conducting wire. What is the ratio of electric field intensities at their surface?
8. What is the ratio of maximum height attained to the height attained at t = 1s for a projectile of initial velocity 'u' projected at an angle 30^o with horizontal
9. If $r_1 = \frac{cp}{cv}$ of a rigid diatomic gas and $r_2 = \frac{c_p}{c_v}$ of non rigid diatomic gas. find r_1 and r_2
10. If a body travels half of the total distance with $\frac{20km}{hr}$ and other half with velocity of $\frac{30km}{hr}$ find average velocity
11. If an open pipe suddenly closed frequency of third harmonic of closed pipe is 50Hz more than fundamental frequency of open pipe. find fundamental frequency
12. mass of neutron 1.0087u, mass of proton = 1.0073u, mass of $4He_2$ = 4.0018. find binding energy of He
13. If I, E and L are the moment of inertia, rotational kinetic energy and angular momentum respectively then

    A) $I = \frac{E}{L}$ B) $2E = \frac{I}{L}$ C) $L = \sqrt{2EI}$ D) $E = L = \sqrt{\frac{L}{I}}$
14. Kirchoff's first and second la are consequence of conservation of ----- and ----- respectively
    A) Energy and Charge
    B) Charge and Energy
    C) Angular momentum and energy of capacitance C
15. Two identical capacitors of capacitance C are connected in series. If the space between the plates of one fo the capacitor is filled with a medium of dielectric constant k, what is the effective capacitance?

16. If the ratio of escape velocities is 3 : 2 from two different planets A and B of radii in the ratio 2 : 3. find the ratio of acceleration due to gravity at the surface of A to that at the surface of B

17. Find the velocity of wave given by $y = 0.05 \sin \frac{2\pi}{\lambda}(x - 200t)$

18. If work function of a metal is 6.6eV. Find the threshold wavelength $\left(h = 6.6 \times 10^{-34}\ Js\right)$

19. A circular loop is made from a wire of length 6m. If 2A current passes throught the circular loop. What is the magnetic moment of the loop?

20. A galvanometre of 500Ω resistance is shunted such that only 4$ of the current passes through the galvanometre. Find the shut resistance

21. If a body of mass 5kg has a linear momentum 4kgms⁻. Find the kinetic energy

22. Find the relation between wavelength of proton and electron, if both particle have same kinetic energy

A) $\lambda_e > \lambda_p$ B) $\lambda_p = \sqrt{1831}\ \lambda_e$ C) $\lambda_p = 1831\ \lambda_e$ D) $\lambda_p = 183\ \lambda_e$

23. A particle of charge equal to 10 times the charge of electrons revolves in a circle with frequency equal to 10 revolutions per second. Find the magnetic field at the centre of the circular path

24. I = 2A, $\phi = 10^{-2}$ Weber, N = 1000. Calculate the self inductance

25. What should be connected in the circuit to remove ripples in AC

26. What should be connected in the circuit to remove ripples in AC
    A) Capacitor in series with load resistance
    B) Capacitor in parallel with load resistance
    C) Inductor connected in parallel with load resistance

27. Bernoullis principle is applicable for
    A) non compressible non viscous fluid having stream line flow
    B) non compressible non- viscous fluid having turbulent flow

28. If power = 150kw, torque = 100Nm, find the angular velocity w.

29. What is the ratio of line of longest wavelength in Lyman and Balmer series?

30. A carnot engine is working between 400k and 500k. If the output work is 1kJ, what is the heat absorbed?

31. At a certain height h from surface of earth, the value of acceleration due to gravity is g/9 where g is the acceleration due to gravity at the surface. What is the value of h in terms of radius of earth R?
    A) R/2 B) R/3 C) 2R D) 3R

32. If a proton is displaced by 5m in an electric field of 50N/C. What is the work done by the electric field?

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37. If I = 16A, electron density = $5\times 10^{23} m^{-3}$
    A = $1 \times 10^{-7} m^2$, find drift velocity
38. Transformer core is laminated because
    A) to reduce eddy current loss
    B) to reduce hysterisis loss
    C) to reduce copper lose
39. For an elastic collision
    A) both momentum and K.E is conserved
    B) only KE is conserved
    C) only momentum is conserved
    D) neither momentum nor K.E conserved
40. Current in a circuit is 0.6A when an external resistance 3Ω is connected. When the external resistance is changed to 6Ω. Current in the circuit becomes 0.4A. Find nternal resistance of cell
41. Which of the following statement is correct for em wave
    A) Velocity in vacuum is 3×10^6 cm
    B) They can travel in vacuum
    C) Energy density of electric field and magnetic field are different
    D) It contains electric field vibration only
    E) It contains magnetic field vibration only
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