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STUDY CENTRE, PALA

# KEAM 2026

## 19-04-2026



SCAN ME

### VIDEO SOLUTION

# MEMORY BASED QUESTIONS

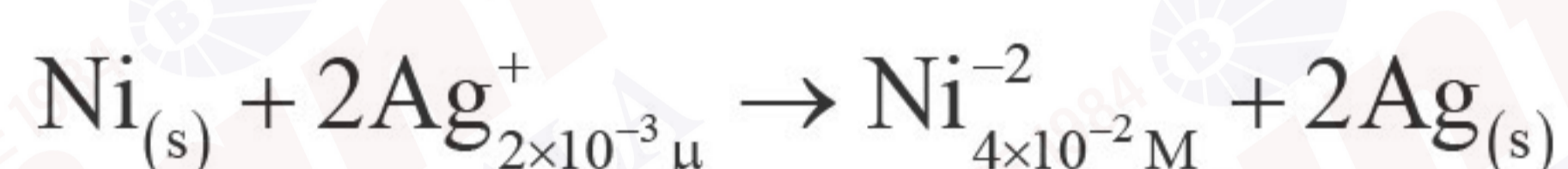
1. Reagent used to convert decanol to decanoic acid
  - A) Tollen's reagent
  - B) Jones reagent
  - C) Grignard reagent
  - D) Fehling's reagent
  - E) DIBAC-H
2. IUPAC name of  $(\text{CH}_3)_3\text{C}-\text{CH}_2\text{Br}$
3. Geometry of a molecule  $\text{AB}_3\text{E}_2$  with 3 bond pairs and 2 lone pairs
4. Which do not form carbylamine
  - A) Ethanamines
  - B) Benzamine
  - C) Prop-2-amine
  - D) Propan-1-amine
  - E) N-methylethanamine
5. Which transition metal has more than one metallic structure at normal temperature?
  - A) Cr
  - B) Ni
  - C) Mn
  - D) V
  - E) Cu
6. An organic compound  $\text{C}_5\text{H}_{10}\text{O}$  does not reduce Tollen's reagent but forms addition compound with sodium hydrogen sulphite and gives the Iodoform test. On vigorous oxidation, it gives ethanoic acid and propanoic acid.
7. Which are complex reactions?
  - (i) Oxidation of ethane
  - (ii) Thermal decomposition of HI on gold surface
  - (iii) Saponification of methyl acetate
  - (iv) Nitration of phenol
  - (v) Decomposition of  $\text{NH}_3$  on hot Pt surface
8. Conc. of  $\text{H}^+$  ions in HCl solution is  $3 \times 10^{-3} \text{ M}$  then  $\text{pH} = \text{-----?}$
9. Mass of ethanoic acid required to prepare 0.5m solution containing 100g of water?

10. Spin only magnetic moment given not correct is

- A)  $\text{Ni}^{2+}$  (4.73)      B)  $\text{Fe}^{2+}$  (4.90)  
C)  $\text{Ti}^{2+}$  (2.84)      D)  $\text{CO}^{2+}$  (3.89)      E)  $\text{Mg}^{2+}$  (5.92)

11. Minimum energy required to remove an atom from sodium is  $3.313 \times 10^{-19}$  g. Maximum wavelength of radiation that will get photoelectron

12. Find the emf of the reaction at 298K



$$(E_{\text{cell}}^0 = 1.5 \text{ at } 298\text{K})$$

13.  $\text{X}_2 + \text{O}_2 \rightleftharpoons 2\text{XO}$

Concentration of  $\text{X}_2$  and  $\text{O}_2$  are  $4 \times 10^{-3}$  and  $3 \times 10^{-3}$  respectively. Equilibrium concentration of  $\text{XO}$  ( $K_c = 0.5$ )

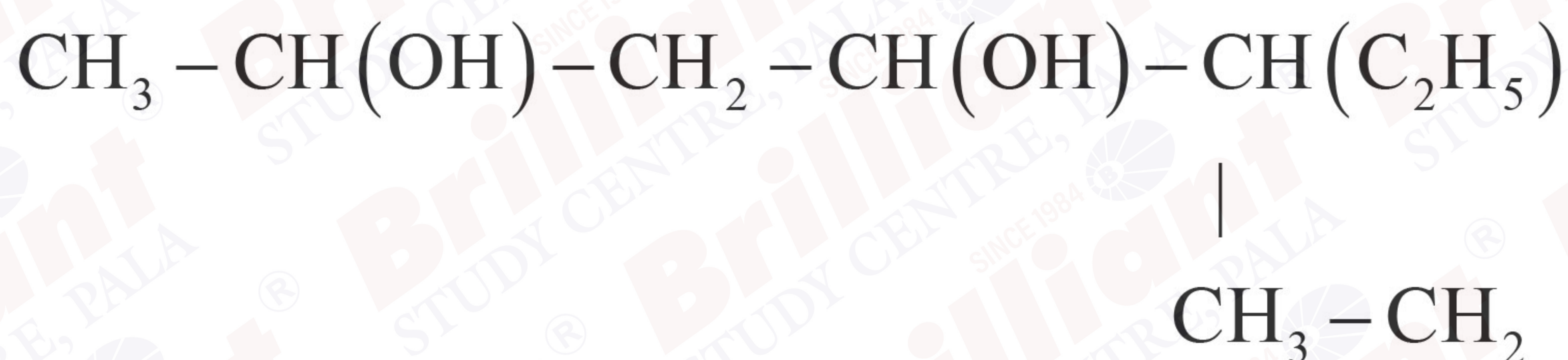
14. Which pairs have ability to form  $p\pi - p\pi$  multiple bonds

- A) C and O      B) B and N  
C) N and P      D) F and Cl      E) C and Si

15. Pyridinium chlorochromate is a complex of .....

16. In Chemotherapy, liqannd used to remove excess of Cu

17. IUPAC name of





48. Solve  $(x + 2y) dx + (2x - y) dy = 0$

49.  $f(x) = 1 + x \log(x + \sqrt{x^2 + 1}) - \sqrt{x^2 + 1}$ ,  $x \geq 0$  strictly increasing in

50.  $\int \left[ \frac{1}{(1+x^2)} - \frac{2}{(1+x)^3} \right] e^x dx$

51. Perpendicular drawn from origin to the straight line  $\sqrt{3}x + y - 24 = 0$  makes an angle  $\alpha$  with positive direction of X - axis then  $\alpha =$  \_\_\_\_\_

52. Which of the following is not true

1)  $f(x) = x|x|$  differentiable in  $(-1, 1)$

2)  $g(x) = \sqrt{|x|}$  differentiable in  $(4, 5)$

3)  $h(x) = |x - 2| + |x - 3|$  differentiable in

4)  $k(x) = |x + 1| + |x - 6|$  differentiable in  $(-1, 6)$

5)  $f(x) = x + [x]$  differentiable in  $x =$

53.  $f(x) = \begin{cases} \frac{2x^2 + 3x - 5}{x - 1}, & x \neq 1 \\ k, & x = 1 \end{cases}$  is continuous at  $x = 1$ , then  $k =$

1. If  $9P_5 = 504 (6P_r)$ . Find  $\lambda$
2. If  $\vec{a} = 2\hat{i} - 2\hat{j} + 4\hat{k}$ ,  $\vec{b} = -5\hat{i} - \hat{j} + 8\hat{k}$  and  $\vec{c} = 3\hat{i} + \hat{j} - \lambda\hat{k}$ . If  $\vec{a} + \vec{b} + \vec{c}$  is perpendicular to  $\vec{a} - \vec{b} + \vec{c}$   
Find  $\lambda$
3. Find  $\begin{vmatrix} 11 & 1 & 1 \\ 1 & 21 & 1 \\ 1 & 1 & 31 \end{vmatrix}$
4. Find the eqn of the line passing through  $(-1, 2, -4)$  and parallel to  $\frac{-x-1}{4} = \frac{2y+1}{-1} = \frac{-z+4}{3}$
5. Find the minimum value of  $f(x) = \frac{x^{100} - 1}{x^{100} + 1}$
6. If  $y = \frac{3x^3 - 2x^2 + x}{|x|}$ ,  $x \neq 0$  find  $\frac{dy}{dx}$  at  $x = -2$
7.  $\int \frac{\sin(\cot^{-1} x)}{1+x^2} dx$
8. Find the number of terms in 2, 6, 18.....1458
9. Find the domain of  $\frac{\log(x-5)}{x^2 + 3x - 4}$
10.  $\lim_{x \rightarrow 0} \left[ \frac{\sin^2 x}{1 - \cos x} \right]$
11. If  $\tan \alpha = \frac{5}{6}$ ,  $\tan \beta = \frac{5}{11}$   $\left( 0 < \alpha, \beta < \frac{\pi}{2} \right)$
12. Find the sum of all 3 digit numbers using the digit 1, 2, 3, 4 without repetition
13.  $\int_0^1 \left[ \tan^{-1} \left( \frac{1}{1+x+x^2+x^3} \right) + \tan^{-1} (1+x+x^2+x^3) \right] dx$
14. Find the differential equation of  $y = Ae^x + Be^{-2x}$
15. Solve  $5 < |x-1| < 15$
16. Find the value of  $\sin \left( 2 \sin^{-1} \frac{3}{5} \right)$
17. If  $f(x) = x^2 + 4x + 4$ ;  $x \leq -2$ . Find  $f^{-1}(x)$
18. Find the length of latus rectum of  $y^2 + 8x + 4y + 12 = 0$

19. Find  $\sin^{-1} \left( \sin \frac{5\pi}{9} \cdot \cos \frac{\pi}{9} + \sin \frac{\pi}{9} \cdot \cos \frac{5\pi}{9} \right)$

20. If  $Z_1 = \frac{5+7i}{7-5i}$ ,  $Z_2 = \frac{3+2i}{3-2i}$ ,  $Z_3 = \frac{1+11i}{11-i}$ . Find the value of  $Z_1 \times \overline{Z_1} + Z_2 \overline{Z_2} + Z_3 \overline{Z_3}$

21. Find the eqn of the parabola having vertex (2, -5) and focus (5, -5)

22. If  $(3+i)x + y + (1-i)y + (3i-4) = (2x+1)i + (x-y+2)i$ . Find (x, y)

23. Find the shortest distance b/w the line  $\vec{r} = -\hat{i} + t\hat{k}$  and  $\vec{r} = -\hat{j} + S\hat{i}$ ;  $t, S \in \mathbb{R}$

24.  $\lim_{x \rightarrow 0} \frac{\sqrt{1 - \cos(x^2)}}{1 - \cos x}$

25.  $\int \frac{\sin t + \cos t}{13 + 36 \sin 2t} dt$

26.  $\lim_{x \rightarrow 1} \frac{x-1}{3\sqrt{x}-1}$

27. If  $f(x) = \frac{2x+3}{x-2}$ ;  $x \neq 2$  and  $x \in \mathbb{R}$

28. If  $P = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 10 & 100 & -1 \end{bmatrix}$  Find  $P^{4052}$

29. If  $|\vec{a}| = \sqrt{26}$ ,  $|\vec{b}| = \sqrt{3}$   $\vec{a} \times \vec{b} = 5\hat{i} + \hat{j} - 4\hat{k}$ . Find  $\vec{a} \cdot \vec{b}$

30. In a GP  $a_1 = 7$ ,  $a_n = 448$  and  $S_n = 889$ . Find the common ratio of the G.P

31. If R  $(-2, 2)$  is a point on the ellipse  $\frac{(x-3)^2}{25} + \frac{(y+2)^2}{16} = 1$ . If S and T are the foci of an ellipse find RS + RT

32. Find the coefficient of  $x^{-2}$  in  $\left(3x - \frac{1}{3x}\right)^4$

33. Find the solution set of  $\frac{x-3}{x-2} \geq 1$

34.  $\int_0^1 x(1-x)^4 dx$

35. Find the domain of  $f(x) = 2\left[\sin^{-1}(2x-1)\right] - \frac{\pi}{4}$

36. Find the value of  $i^{13} + i^{19} + \dots + i^{226}$

37.  $\frac{4^{n+1} + 16^{n+1}}{4^n + 16^n} = \text{G.M of 4 and 16}$  find n?

38.  $(3 + 5x)e^{\frac{y}{x}} = x$ , find  $\frac{dy}{dx} =$

39. If the end of a diameter of the circle is  $(-4, -2)$ , find the other end of the diameter

40. Find x in  $4\sin^2x - 2(1 + \sqrt{3})\sin x + \sqrt{3} = 0$ ,  $15^\circ < x < 150^\circ$

41. Find mean deviation about mean of 5, 6, 14, 15

42.  $\sin 6^\circ \times \sin 36^\circ \times \sin 60^\circ + \cos 12^\circ \times \sin 42^\circ \times \sin 18^\circ =$

43. If  $y = e^{-x^2}$ , find  $\frac{d^2y}{dx^2} + 2x \frac{dy}{dx} =$

44. If  $I = \int_{-1}^1 \frac{x^4}{1-x^4} \cos^{-1}\left(\frac{2x}{1+x^2}\right) dx$  find 2I

45. If  $A = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$  and  $(\alpha I + \beta A)^2 = A$  find  $\alpha^2 - \beta^2$ ?

46. If  $\sin \theta \times \cos \theta > 0$  then  $\theta$  lies in

47.  $\begin{bmatrix} x & 3 & -1 \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 \\ -1 & 0 & 1 \\ 1 & 0 & -1 \end{bmatrix} \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix} = 0$

- If orbital radius of geostationary satellite decreases, gravitational potential energy  
A) Increases                      B) Decreases                      C) Remains same.
- A ball falls from a height of 20 m, and then bounces back up to 17 m height. The loss of energy is
- A body of mass 'm' is acted upon by two perpendicular forces 4N and 3N. Find mass 'm' if acceleration of a body is  $2 \text{ m/s}^2$
- The work function for a metal having threshold frequency  $5 \times 10^7 \text{ Hz}$  is?
- An effective power of a combination of 5 identical convex lens having focal length  $f = 20 \text{ cm}$  is
- Potential difference between two points in a region having uniform electric field of  $800 \text{ N/C}$  is 16V. Find the distance between two points.
- In a Young's double slit experiment with a light having wavelength 500 nm, separation between slit is 0.2 mm, distance between slit and screen is 2m. Find fringe width.
- What is the specific heat capacity at constant volume for non-rigid diatomic gas.
- A constant current of 3A flows through a conductor having potential difference of 200V. Find heat developed in conductor in 25s.
- In a forward biased semiconductor potential changes from 0.9V to 0.6 V. Find current if resistance is  $1\Omega$   
A) 300 mA                      B) 200 mA                      C) 450 mA
- If external force acting on a body is zero, centre of mass of body  
A) decreases                      B) remains constant  
C) increases                      D) first increases then decreases
- A cyclotron has frequency  $f$  and energy  $E$ . If the energy is doubled, frequency becomes  
A)  $f$                       B)  $2f$                       C)  $\frac{f}{2}$                       D)  $4f$
- Which of the following is diamagnetic  
A) Bi                      B) Gd                      C) Co  
D) Na                      E) Fe
- Which of the following is incorrect  
A) Stress is not a vector quantity.  
B) Young's modulus is only applicable for solids.  
C) Compressibility is applicable for solids, liquids and gases.  
D) Young's modulus is greater for elastomers than metal.

15. If fundamental frequency of an open pipe is 200 Hz, then find the fundamental frequency if one end is closed.
16. Energy of electron of hydrogen atom in 3<sup>rd</sup> excited state is
17. The displacement of a body at any time t is given by

$$x = \frac{3}{4}t^2 + 12t + 3$$

The velocity of the body is zero after:

18. Two syringes have piston in the ratio 1 : 5 . If the pressure exerted in both syringes is same, find the ratio of the forces applied on the piston.
19. A spring of spring constant 'k' cut into n pieces. What is the spring constant of each piece?
- A)  $\frac{k}{n}$                       B)  $\frac{n}{k}$                       C)  $\frac{n^2}{k}$                       D) nk

20. The capacitance of a capacitor is C when there is air (or vacuum) between its plates. When a dielectric is completely inserted between the plates, the capacitance becomes 2C. Find the dielectric constant of the material.

21.  $\vec{P} = x\hat{i} + 0.8\hat{j} + 0.6\hat{k}$

If magnitude of  $\vec{P}$  is 2, value of x is

- A)  $\sqrt{3}$                       B) 2                      C)  $\sqrt{2}$                       D) 1

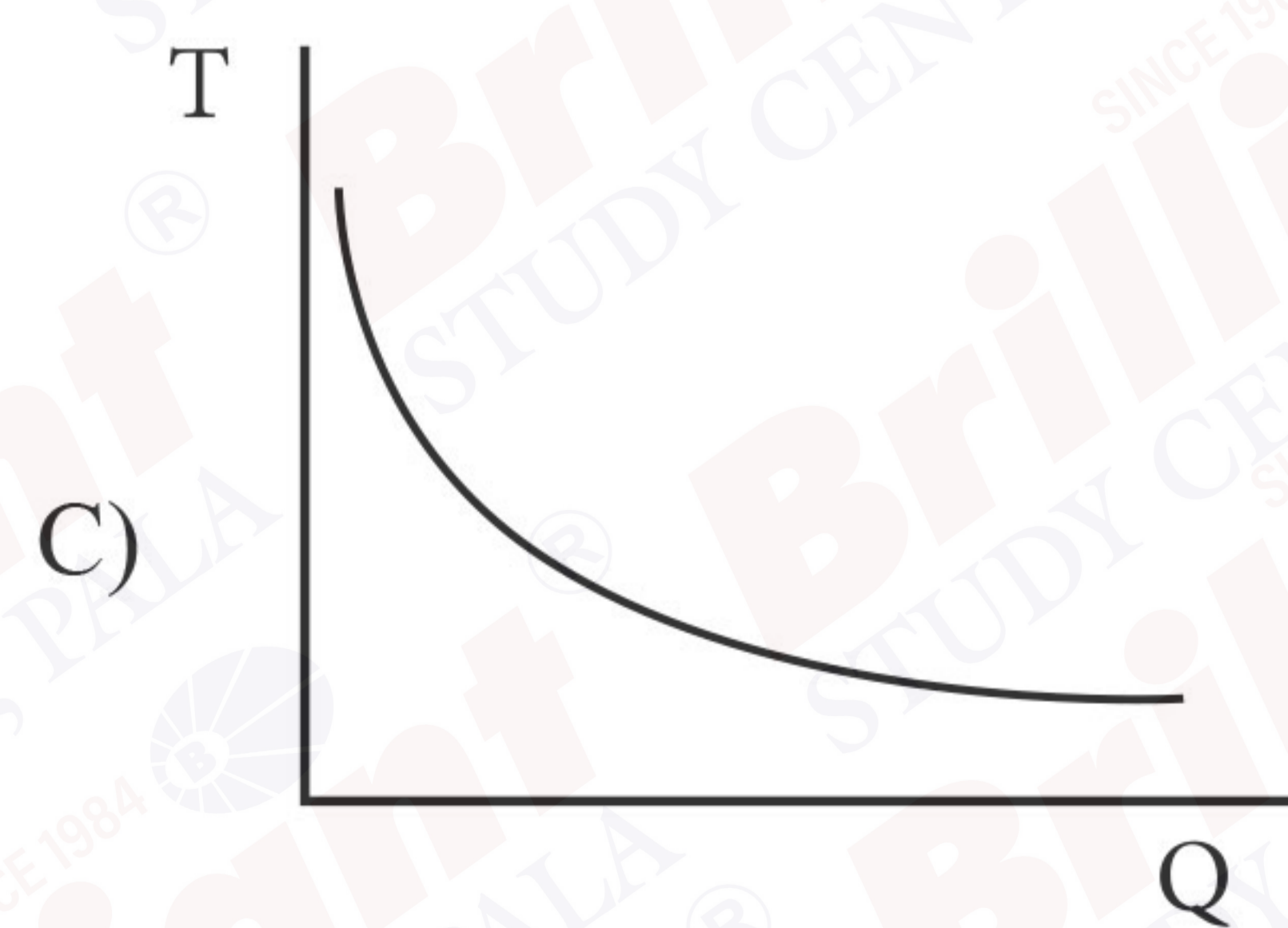
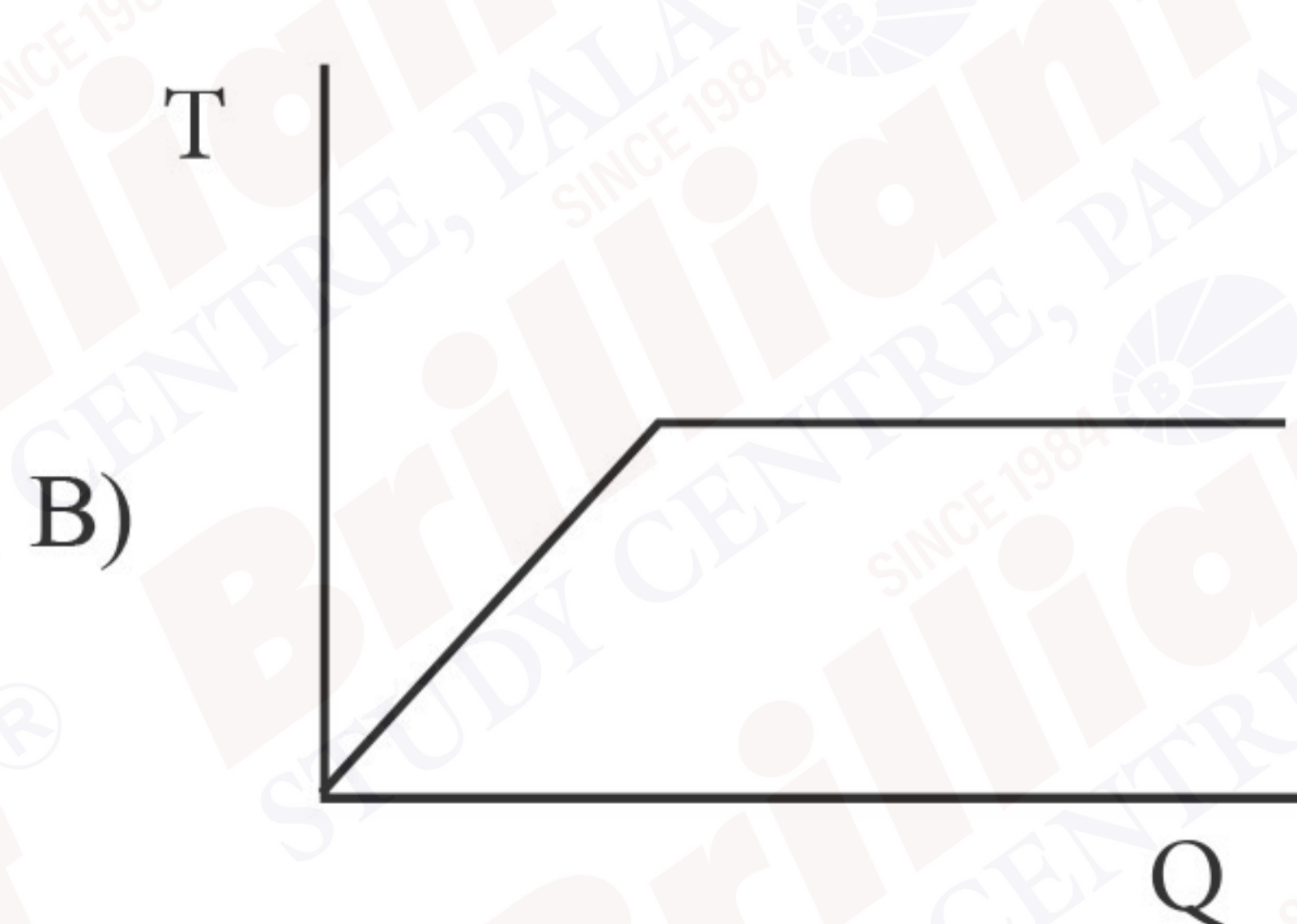
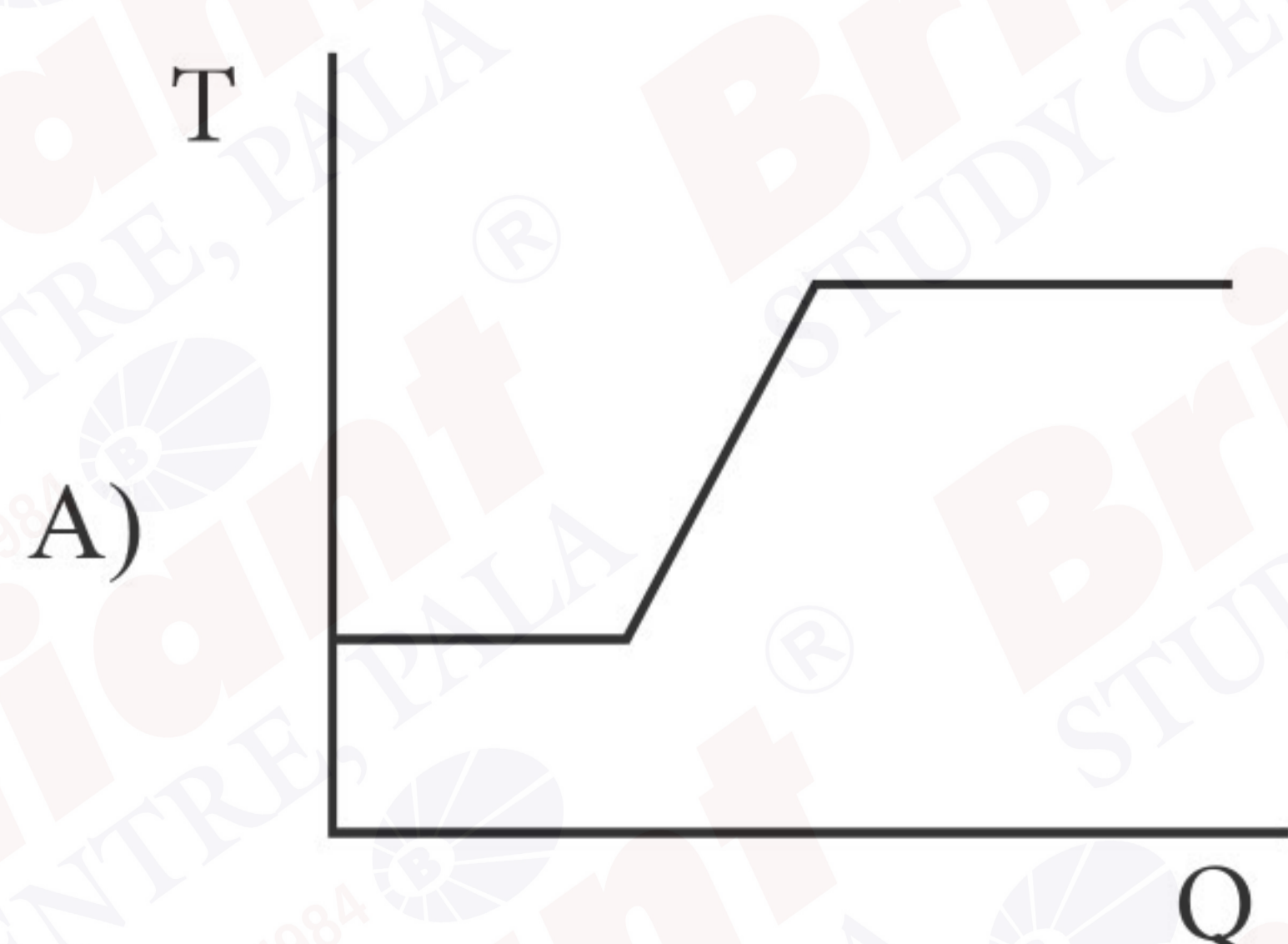
22. A particle moves in a circular path of radius 4 cm

23. A particle moves in a circular path of radius 4 cm. It completes 5 revolutions in 2 minutes. Find its linear velocity.

24. In simple harmonic motion (SHM), the acceleration of a particle at a displacement of 3m from the mean position is 48 m/s<sup>2</sup> directed towards the mean position. Find the angular frequency.

25. The force experienced by the Earth due to solar radiation is  $9 \times 10^9$ , N. Find the radiation pressure on Earth. (Radius of Earth R =  $6.4 \times 10^6$ , m)

26. When ice at 0°C is heated and converted into steam at 100°C, which graph correctly represents the variation of temperature with heat supplied?



1. A spherical conductor contains  $5 \times 10^6$  electrons. If the Radius of the sphere is 10cm, find the electric field at its surface
2. Find the total energy released when 235g of  $^{235}_{92}\text{U}$  undergoes complete fission. Assume that the energy released per fission is about 200 MeV
3. Transverse wave in a string is given by  $y = 3 \sin 2(25 + 0.4x)$  m  
What is the velocity of wave?
4. A ball of mass 200g strikes a wall with a speed 5m/s and rebounds with same speed in the opposite direction. If the average force exerted on the wall is 5N, find the time of contact between the ball and wall
5. Two identical cells, each of emf 2V and internal resistance  $0.1\Omega$ , are connected in parallel. Find effective emf and the effective internal resistance of the combination.
6. A copper wire of cross sectional area  $2\text{mm}^2$  carries a current I and has drift velocity  $V_1$ . Another copper wire of cross-sectional area  $1.5\text{mm}^2$  carries a current 2I and has drift velocity  $v_2$ . Find ratio  $\frac{V_1}{V_2}$
7. A solid sphere of radius 20cm has the same mass as a solid cylinder. If their moments of inertia about their respective central axes are equal, find radius of the cylinder.
8. In which thermodynamic process does the internal energy of an ideal gas remain unchanged?
9. A gun fires 25 bullets per second. Each bullet has a mass of 10g and is fired with a velocity of 20m/s. Find the recoil force on gun.
10. A satellite moves in an elliptical orbit around planet such that its maximum distance and minimum distance from planet are in the ratio 3:1. If its speed at the nearest point(perigee) is V, find its speed at the farthest point (Apogee)
11. A particle moves such that its position is given by  $y = t^2 + 2t + 3$ (m). Find the average acceleration of the particle between  $t = 3$ s and  $t = 6$ s
12.  $A = \frac{B}{CD^2}$ , If B, C and D have dimension of inductance reactance, capacitive reactance and angular frequency. then dimension of A

13. A beam of unpolarized light of intensity  $I_0$  is incident on a polarizer. A second polaroid is placed in the path such that its transmission axis makes an angle of  $45^\circ$  with the first polaroid. What is the intensity of light after it passes through the second polaroid.
14. For an electron of mass  $m$  and charge 'e' ratio of angular momentum to magnetic
15. Which of the following have highest modulus of elasticity  
A) Steel                      B) Aluminium                      C) Brass                      D) Glass
16. At which condition do the experimental P-V curve and predicted P - V curve closely match?  
a) Low temperature and high pressure  
b) low temperature and low pressure
17. Which law is the symmetrical counter part of Faradays law in electromagnetic induction  
A) Ampere Maxwell law  
B) Ampere Circuital law  
C) Gauss's law  
D) Coulombs law
18. A wire of fixed length is bent into a single circular turn, producing a magnetic field  $B$  at its center. If the same wire is bent into 3 circular turns (carrying the same current), What will be the magnetic field at the centre
19. find rms current  
$$i = 4\sqrt{2} \sin \omega t + 3\sqrt{2} \cos \omega t$$
20. Ratio of distance travelled by a freely falling body in successive intervals of time is
21. A block of 10kg mass moving on a frictionless surface with 5m/s compresses the spring by 5cm and come to rest. What is the force constant of the spring.
22. A uniform rod of mass  $m$  and length  $l$  rotating in a horizontal circle about a vertical axis passing through one of its ends with angular velocity  $\omega$ . What is the angular momentum of the rod
23. If threshold wavelengths of two metals are in the 3:1. What is the ratio of their work function.
24. If the electric potential is  $V = 3x^2 + 4x$ , then magnitude of Electric field at  $x = 1\text{m}$  is
25. Which of the following is not extensive variable.  
A) total mass                      B) internal energy  
C) Volume                      D) Density                      E) Work done
26. What is the mass of one molecules of water in kg
27. A capacitor as capacitance  $C$   $\mu\text{F}$ . If the energy stored in it is  $18 \times 10^{-8} \text{J}$ . Find charge stored in capacitor.
28. The radius of inner most orbit of Hydrogen is  $0.53 \text{ \AA}$ . What is the radius of 3rd orbit
29. Order of the electric field required to pull out electrons from a metal by field emission is
30. Relative viscosity of blood  $\frac{\eta}{\eta_{\text{water}}}$  is constant in which temperature range
31. Magnifying power of simple microscope can be increased by using.
32. In a Si crystal containing  $N$  atoms at absolute zero, energy state of
33.  $2q$  and  $q$  having equal momentum enter uniform magnetic field in a direction perpendicular to magnetic field. Find ratio of radii
34. Instantaneous displacement of a wave is  $y = 2(\sin \pi t + \sqrt{3} \cos 2\pi t)$  cm . Find amplitude of wave in cm.
35. In an air core solenoid with  $L = 0.5\text{mH}$  filled with soft iron of relative permeability 1500. Find new  $L$

36. Bar magnet is rotated from parallel position to  $45^\circ$  position work done is 2.07J. Find workdone to rotate from  $45^\circ$  to antiparallel position.
37. Real object is placed at focus in front of a convex mirror of focal length  $f$ . Find the distance to the image formed.
38. Ratio of magnitude of gravitational potential energy to that of kinetic energy of satellite of mass  $m$
39. Uniform metallic wire of radius ' $r$ ' and length ' $l$ ' is heated by passing constant current. The heat produced can be made  $n$  times of
- A)  $2l$                       B)  $\frac{l}{2}, \frac{r}{2}$                       C)  $2l, \frac{r}{2}$   
D)  $2r$                       E)  $2l, 2r$
40. Capillary tubes of radii 1 : 2 are dipped in same solution. Then the ratio of height of liquid rise is