

KEAM 2025 DAY-4

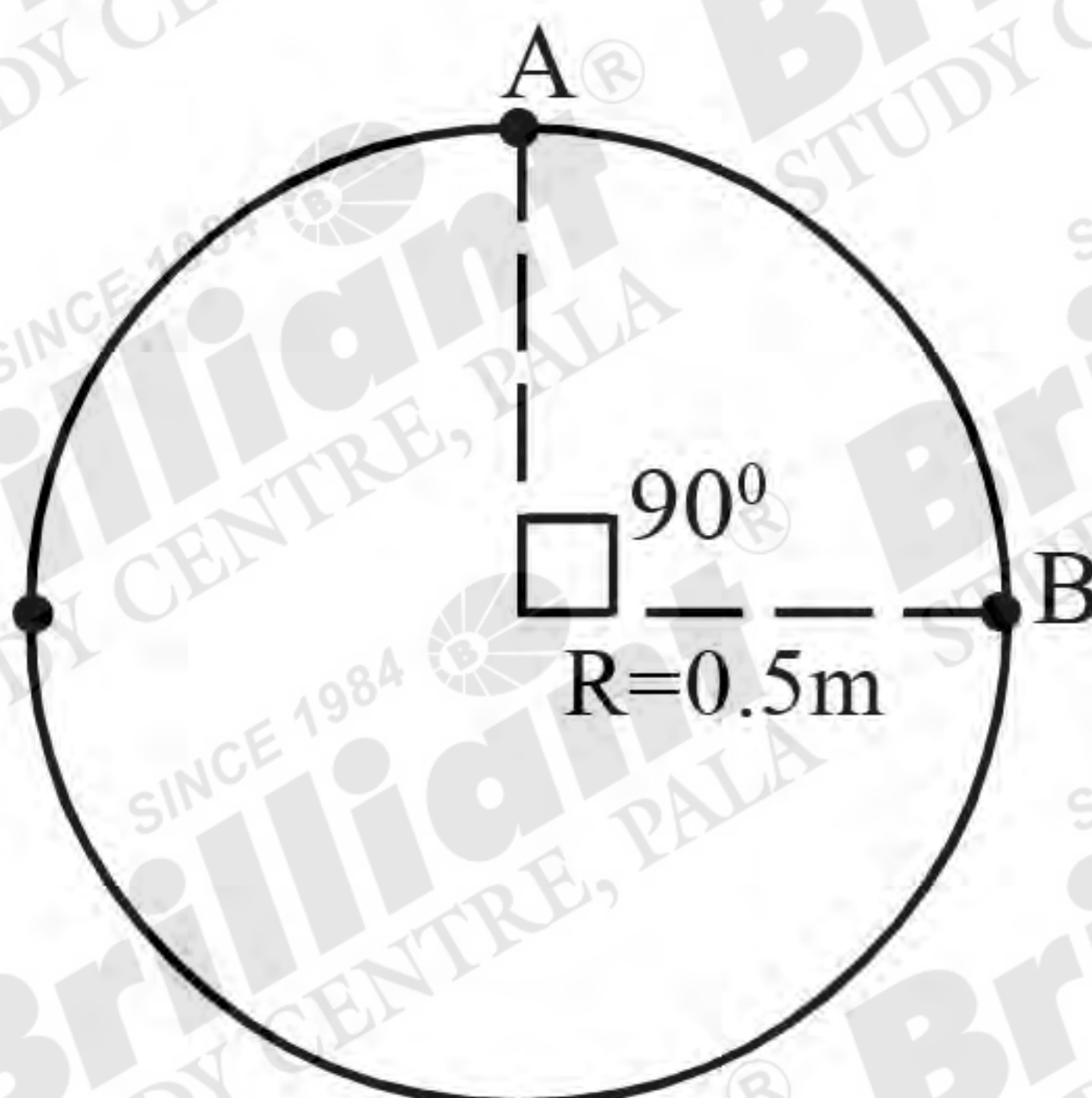


SCAN ME

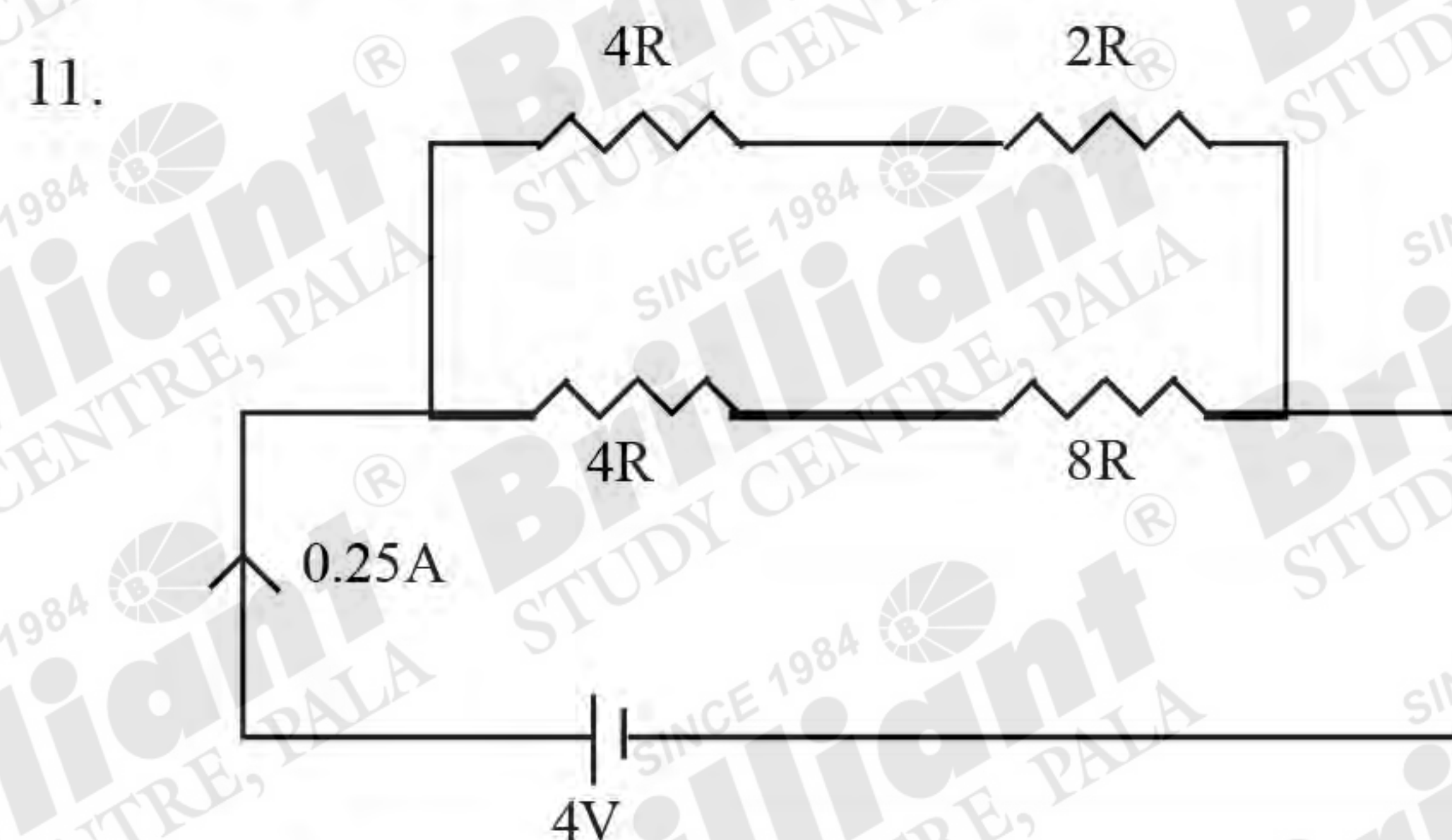
VIDEO SOLUTION

MEMORY BASED QUESTIONS

- Two satellites are revolving at a distance $2.5R$ and $7.5R$ from the centre of earth. Find the ratio of time period of satellite.
- Work done to move charge of $5C$ from P to Q is $10J$. If the potential at P is $0.5V$, then potential at Q is
- Which of the following is not ferromagnetic
A) Fe B) Co C) Ni D) Gd
- A particle is moving in circular path as shown in figure. Find the average velocity from A to B for time $t = \sqrt{2}S$



- Specific heat capacity depends on
- If the time period of oscillation is $8s$, then time period of potential energy is
- If the resistance of a wire is 5Ω and 6Ω are at $30^\circ C$ and $40^\circ C$ respectively. Find the temperature coefficient of resistance of wire.
- The ratio of masses of two particles having same linear momentum is $1 : 3$. Find the ratio of their kinetic energy
- $F = 6\pi\eta x$. Find dimension of x



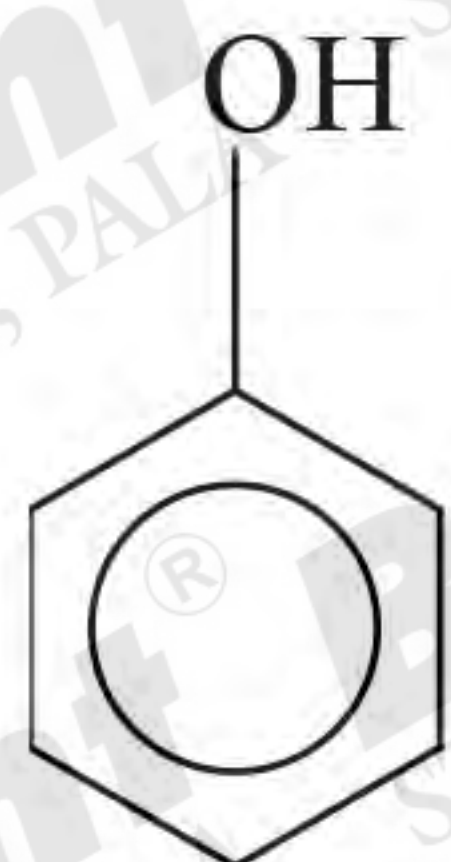
Find R

- A wire of resistance 25Ω is divided into 'n' parts and connected in parallel. If the effective resistance is 1Ω , find 'n'
- Light energy redistributed in
A) Refraction and reflection
B) Refraction and interference
C) Interference and diffraction

14. A cricketer hits ball with initial velocity of 40m/s. Calculate the maximum range.
15. If the moment of inertia and Rotational kinetic energy of a particle are 4kgm^2 and 50J respectively. What is the angular velocity of the particle.
16. A light is incident on a surface having refractive index $\frac{4}{3}$ and reflected light is completely polarised. $\left(\tan i = \frac{4}{3}\right)$. What is the angle of incidence
17. A pn junction diode without bias act as
A) Transistor B) Resistor C) Voltage regulator D) AC transformer
18. If P_0 is the atmospheric pressure and P is the pressure at a depth h, find the Gauge pressure
19. If angular displacement in 10s is 150π , find the number of revolution in 10s
A) 75 B) 100 C) 150 D) 50
20. A particle moving in a horizontal circle of radius 0.5m. Complete half rotation. The work done by the centripetal force of 5N on the particle
21. Bernoulli's principle is applicable to -----
22. If an inductor coil of self inductance 2H stores 25J of magnetic energy, then current passing through it is
23. If mean free path of gas molecule at 27°C is $10 \times 10^{-7}\text{m}$, then mean free path at 87°C is
24. Chromatic aberration arises in their lens is due to
25. A musician hits a drum 90 times in a minute. Time period of hit is
26. If V is the velocity of wave in a rope having tension T. Find velocity when tension becomes 8T.
27. A body hanging by a rope in a lift to which is moving upward with constant acceleration of 0.2m/s^2 . Tension in rope is 80N. find mass of body.
28. What is the de Broglie wavelength associated with a particle of mass $66.3 \times 10^{-31}\text{Kg}$ moving with velocity $1 \times 10^9\text{ms}^{-1}$.
29. What is the ratio of distances travelled by a body in the first two intervals of 5 seconds. (Given the initial velocity $u = 1\text{ms}^{-1}$ and body moves with a constant acceleration of 5ms^{-2})
30. 1 torr =
31. What is the force to be applied on a body of mass 200g to change its velocity by 25ms^{-1} in 5s?
32. Two particles of same mass have charges in the ratio 3 : 1. What is the ratio of their time periods when they enter constant magnetic field with the same velocity?
33. The orbital velocity of a satellite is V_0 at a height $h = R$ (R is the radius of earth) from the surface of the earth. What is the relationship between V_0 and the escape velocity V_e

34. When an electron is accelerated through a 480V wavelength is λ . Find wavelength in terms of λ if it is accelerated through 120V
35. Minimum Wavelength of Brackett series corresponds to transition from n_1 to n_2 where n_1 and n_2 are respectively. -----
36. The displacement of a body varies with time t as $S = \frac{t^2}{2} - 6t$. Find the time at which the velocity becomes zero.
37. A batsman strikes a ball at an angle θ with speed 40m/s. It falls at a distance 160m from the batsman. How far does the ball falls if he strikes at the same angle with initial velocity 50m/s?
38. Find the incorrect pair
- A) Isobaric - constant pressure
 - B) Isochoric - constant volume
 - C) Isothermal - constant temperature
 - D) Adiabatic - involves heat exchange
39. $E = 3.8 \sin(1.57y + 2.6t)$ V / m. Find the wavelength
40. The effective capacitance when n identical capacitor are connected in parallel is $10\mu\text{F}$ and when connected in series is $0.4\mu\text{F}$. Find the value of n
41. What is the working principle of Bunsen burner?
42. The initial amount of radioactive element in a sample is 6×10^5 . After 48 yrs, the number of radioactive element becomes 0.75×10^5 . Find the half life?
43. Current in a coil changes at the rate of 10As^{-1} the induced emf is 120V. Find the inductance L of the coil.

- The IUPAC name of allyl amine
- Phenol is treated with conc. H_2SO_4 and then with conc. HNO_3 . The compound A & B are



- Which is most stable in d^5 configuration
 Mn^{2+} Sc^{2+} Ti^{3+} Zn^{2+}
- Which is largest and smallest respective Na, Na^+ , Mg, Mg^{2+}
- Which is a lewis acid
 HCl OH^- H_2O Co^{3+}
- Ethanol is made unfit for drinking by adding
A) $CuSO_4$ & pyridine
- Which of the following is an interstitial compound
A) SC_2O_3 B) Mn_4N C) $TiCl_4$ D) TiN
- Highest magnetic compound
a) Mn^{2+} b) Fe^{2+} c) Cr^{2+} d) Co^{2+}
- $Cr_2O_7^{2-} + xe^- + yH^+ \rightarrow 2Cr^{3+} + ZH_2O$
find the x,y,z in the above reaction
- In which reaction Benzyl chloride is converted to Benzaldehyde
a) Gatterman koch reaction
b) Stephan's reaction
c) Etard reaction
d) Rosemend reduction
- How many bridging complex in there in $[Mg(Co)_{10}]$?
- How many moles of methane are required to produce 11g of CO_2 after combustion
- The most reactive towards SN^2 reaction is
A) Bromoethane B) 2 - bromo propane C) 2 - methyl - 2-bromo propane
- $k = 0.693 \times 10^{-4} s^{-1}$, find half life order reaction
- Entropy decreases in which of the following reaction
 $Br_2(l) \rightarrow Br_2(g)$
 $Br_2(g) \rightarrow Br_2(l)$
- Find the debroglie wavelength of a particle with mass $m = 6.63 \times 10^{-31} kg$ and velocity
 $V = 10^6 m/s$
- When 0.12g of an organic compound gives 0.11g of CO_2 the percentage of carbon is
A) 25% B) 36% C) 17% D) 16%
- Which of the following cannot form hydrogen bonding
A) Phenol B) diethyl ether C) Aniline
- Enthalpy of combustion of C, H and C_2H_4 are given find the enthalpy formation of C_2H_4 ?
- Carbohydrate present in yeast

21. Find the incorrect statement
Isobaric - constant pressure
Isochoric - constant volume
Isothermal - constant temperature
Adiabatic involve heat exchange
22. Solvent in lead storage battery
23. Which of the following mixture shows positive deviation from raults law
Bromoethene, chloroethane
Acetone, chloroform
Ethanol - Acetone
Phenol, Aniline
24. Which of the following is a vicinal dihalide
A) 1,2 dibromo propane B) 1,1 dibromo propane
C) 1,3 dibromo propane
25. Which alkene produces 2 mol CH_3COOH on treating with acidic KMnO_4

1. If $f(x) = \log 3 - \sin x$, $y = f(f(x))$. Find $y'(0)$

2. $\int \frac{9e^x + 4e^{-x}}{9e^x - 4e^{-x}} dx =$

3. $\int_0^{\frac{\pi}{2}} \frac{1}{1 + \sin x} dx =$

4. Find the domain of $f(x) = \sqrt{x^2 + 4x + 4}$

5. If $\tan^{-1} x = \tan^{-1} 3 - \frac{\pi}{4}$. Find x ?

6. $\sin 75^\circ \times \sin 15^\circ \times \sin 45^\circ =$

7. $\int e^{x+\frac{1}{x}} \frac{x^2 - 1}{x^2} dx$

8. In a G.P $9, 3, \frac{1}{3}, \frac{1}{9}, \dots$, find 25th term

9. $y = \cos x \times \sin y$ find $\frac{dy}{dx}$ at $\left(\frac{\pi}{6}, \frac{\pi}{5}\right)$

10. Find the area between the line $y = x-1$, $y = 0$, $-2 \leq y \leq 2$

11. $\int_{-2}^2 |x+3| dx$

12. $\lim_{\theta \rightarrow 0} \frac{\theta \times \sin 2\theta}{1 - \cos 2\theta} =$

13. $\int e^{2\theta} (2 \cos^2 \theta - \sin 2\theta) d\theta$

14. $\int \frac{\sec x}{(\sec x + \tan x)^2} dx$

15. $\int \frac{1}{x^7 \left(\frac{1}{x^6} + 1 \right)} dx =$

16. In a L.P.P the corner points of the feasible region are (5, 0), (10, 0) and (4, 1) and $Z = 2x + 3y$. Find maximum value of Z.

17. $\frac{\cos 75^\circ - \cos 15^\circ}{\cos 75^\circ + \cos 15^\circ} =$

18. $\int_{-2}^2 (e^x - x) dx =$

19. $\operatorname{cosec}^2 x + \sec^2 x + \operatorname{cosec} x \sec x =$

20. $|z - (1+i)| = 5$ represents a circle, with find centre and radius of the circle

21. Sum of n terms of a G.P is 1023, $a = 1$, $x = 2$ find n?

22. Find parametric equation of $y^2 = 8x$

23. $a + b = 10$, ab is maximum. Find a?

24. $\sin \frac{1}{5}$. Find $\sec \theta$ if θ lies in second quadrant

25. $f(x) = [x]$, $x \in (0, 6)$, find number of points at discontinuity?

26. Find the eccentricity of the ellipse $9(x-2)^2 + 4(y+1)^2 = 144$

27. Find area bounded by $y = 0$, $1 \leq x \leq 2$, $y = x + 1$

28. A parallelogram whose sides are $x + y = 5$, $x - y = -5$. The diagonals meet at (3, 6). Find a vertex of parallelogram

29. If $\vec{a} \cdot \vec{b} = 5$ then $3\vec{a} \cdot 3\vec{b}$ is

30. $\sin^{-1}\left(\frac{x}{1+x}\right) = \frac{\pi}{2} - \cos^{-1}\frac{1}{2}$. Find x

31. $\vec{a} = 3\hat{i} + 2\hat{j} + 4\hat{k}$, $\vec{b} = \hat{i} + 2\hat{j} - 4\hat{k}$, then $(\vec{a} - \vec{b}) \cdot (\vec{a} + \vec{b}) =$

32. $\frac{2 \sin \alpha (1 + \sin \alpha)}{(1 + \sin \alpha + \cos \alpha)(1 + \sin \alpha - \cos \alpha)} =$

33. $\frac{6(x-2)}{5} \geq \frac{3(x-1)}{7}$, then x lies in the interval

34. $\int_0^1 \tan t \, dt = \frac{\pi}{4} - \log 2$. Find $\int_0^1 \tan(1-t) \, dt$

35. $e^x - x$ is increasing in the interval _____

36. $z^3 + iz^2 - iz + 1 = 0$, $i^2 = -1$. Then $|z| =$

37. ${}^{100}C_1 + {}^{100}C_2 + {}^{100}C_3 + \dots + {}^{100}C_{99} + {}^{100}C_{100} =$

38. ${}^{21}C_1 + {}^{21}C_2 + \dots + {}^{21}C_{10} =$

39. Find the coefficient of x in $\left(\frac{\sqrt{x}}{2} + \frac{1}{3x^2}\right)^{10} =$

40. $y = (c_1 + c_2) \sin(x + c_3) - c_4 e^x$. What is the order of the differential equation formed

41. If A is 3×2 matrix, C is 3×3 matrix and $AB = C$ then order of B

42. $F(x) = x^3 + 3x^2 f'(1) + 5x f''(2) + f'''(3)$. then $f'''(3) =$

43. $x(\sqrt{x-2} + \sqrt{x-3})$ is continuous in the interval

44. If $x + 2y = 3$ and $x - 4y = 4$ are the equation of diameter of a circle – find centre of the circle

45. Real part of $\frac{1 + \sin \frac{2\pi}{35} - i \cos \frac{2\pi}{35}}{1 + \sin \frac{2\pi}{3,5} + i \sin \frac{2\pi}{35}}$

46. Mean deviation about mean of 400, 410, 420, 430, 440

47. If $u = \sec^{-1}(\sec 2\theta)$ $v = \cos \theta$. find $\frac{du}{dv}$ at $\theta = \frac{\pi}{4}$

48. $P = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 3 \\ 0 & 1 & 6 \end{bmatrix}$, $Q = \begin{bmatrix} 5 & 6 & -1 \\ 2 & 3 & 1 \\ 5 & 11 & 3 \end{bmatrix}$ find $\det(QPQ^{-1})$

49. If $f(x) = 10 - |x-3|$, $f(x)$ is maximum at $x =$

50. $\vec{r} = 2\hat{i} + 3\hat{j} - 5\hat{k} + \lambda(5\hat{i} + 6\hat{j} - 13\hat{k})$ find its cartesian equation

51. If G_1, G_2, G_3 are 3 geometric mean between n and l , then what will be the common ratio of the resulting G.P

52. $\lim_{x \rightarrow 0} \frac{\sin x}{2\sqrt{2} \sin \frac{x}{\sqrt{2}}} =$