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SRI CHAITANYA NATION'S 1ST CHOICE FOR IIT-JEE SUCCESS

5 STUDENTS IN TOP 10 IN JEE-ADVANCED 2024 OPEN CATEGORY

1 AIR	4 AIR	5 AIR	6 AIR	9 AIR	10 AIR
RAGHAV SHARMA Ht. No. 242053073*	RHYTHM KEDIA Ht. No. 247025176*	P KUSHAL KUMAR Ht. No. 246150349	RAJDEEP MISHRA Ht. No. 241016176*	DHRUVIN H DOSHI Ht. No. 241106162	A SIDHVIK SUHAS Ht. No. 246119101

HIGHLIGHTS

- BELOW 100 ALL INDIA OPEN CATEGORY RANKS: 30
- BELOW 500 ALL INDIA OPEN CATEGORY RANKS: 122
- BELOW 1000 ALL INDIA OPEN CATEGORY RANKS: 203
- BELOW 100 ALL INDIA CATEGORY RANKS COUNT: 146
- BELOW 1000 ALL INDIA CATEGORY RANKS COUNT: 721
- NUMBER OF QUALIFIED RANKS: 4187+

Scan QR Code for Admissions

JEE MAIN (JAN) 2025 - SHIFT 2

23-01-2025

JEE Main – 23nd January – 2025 (Shift-2)

[Memory Based Questions]

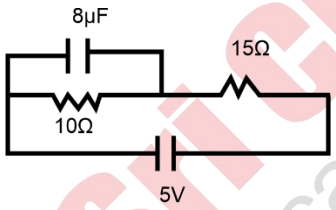
PHYSICS

1. If angle of prism = angle of min deviation. Given $\mu = \sqrt{3}$, then angle of prism?

   a) 30° b) 60° c) 45° d) 25°

   Ans: (b)

2. Find charge on capacitor in steady state.



   a) 16μC b) 20μC c) 8μC d) 24μC

   Ans: (a)

3. The value of E_0 is 9.3 V/m and c is 3×10^8 m/s. Find the value of B_0

   a) 1.5×10^{-8} T b) 3.1×10^{-13} T c) 3.5×10^{-7} T d) 3.1×10^{-8} T

   Ans: (d)

4. Two charges +7 mC and -4 mC at (−7,0,0) and (7,0,0). Find electrostatic potential energy. ($\epsilon_0 = 8.85 \times 10^{-12} C^2\ N^{-1}\ m^{-2}$)

   a) 23 kJ b) 14 kJ c) -18 kJ d) 11 kJ

   Ans: (c)

5. Find the wavelength in (nm) of incident radiation where work function is 4.12 eV and stopping potential is 4 V. (hv = 1242eV)

   a) 153 nm b) 128 nm c) 215 nm d) 75 nm

   Ans: (a)

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CLASSROOM STUDENT
FROM GRADE VI-XII

NEET

B VARUN CHAKRAVARTHI
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6. Match the following

(A) Magnetic permeability	(p) $[M^1A^{-1}T^{-2}]$
(B) Torsional constant	(q) $[L^2A^1]$
(C) Magnetic induction	(r) $[M^1L^2\ T^{-2}]$
(D) Magnetic moment	(s) $[M^1L^1A^{-2}T^{-2}]$

a) A-s, B-r, C-p, D-q b) A-q, B-r, C-p, D-s

c) A-s, B-p, C-r, D-q d) A-s, B-s, C-p, D-r

Ans: (a)

7. A satellite is nine times closer to earth compared to moon. Time period of moon is 27 days then period of satellite is

a) 4 days b) 1 day c) 3 days d) 5 days

Ans: (b)

8. In a series LCR circuit, inductance $L = 30$ mH and capacitance $= 300\ \mu$F. The angular frequency of the source when current has maximum amplitude in the circuit is

(a) $\frac{10^4}{2\pi}$ rad/s (b) $\frac{10^5}{2\pi}$ rad/s (c) 10^5 rad/s (d) $\frac{10^3}{6\pi}$ rad/s

Ans: (d)

9. $E = E_0\sin\left((30\times10^{-3})x - (6000)t\right)$, Here the velocity of the wave is

a) 1.3×10^5 m/s b) 1.7×10^8 m/s c) 2×10^5 m/s d) 3×10^{15} m/s

Ans: (c)

10. In a concave mirror of focal length f, when it is immersed in a medium of R. I. μ. Now the focal length becomes?

a) f b) $\frac{f}{\mu}$ c) $\left(\frac{f}{\mu-1}\right)$ d) fu

Ans: (a)

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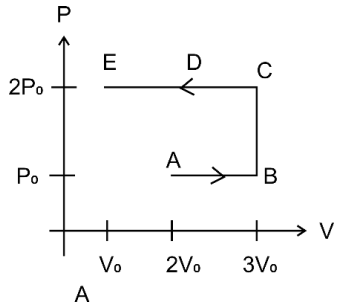
11. Find the work done in the cycle ABCDE



a) $4P0V_0$ b) $-4P0V_0$ c) $-3P0V_0$ d) $3P0V_0$

Ans: (c)

12. There is a horizontal pipe of variable cross-section having fluid of density ρ flowing through it. At cross section $A\&B$ the velocities are $V_A\&V_B$ and pressure P_A & P_B. Find the correct relation between velocities.

a) $V_A - V_B = \frac{\rho}{2(P_B^2 - P_A^2)}$ b) $V_A - V_B = \frac{2(P_A - P_B)}{\rho}$

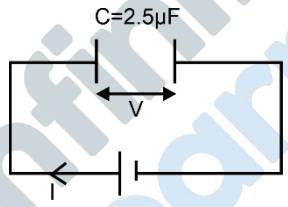
c) $V_A^2 - V_B^2 = \frac{2(P_B - P_A)}{\rho}$ d) $V_A^2 - V_B^2 = \frac{2(P_A - P_B)}{\rho}$

Ans: (c)

13. The energy in a system varies with position and time as $E(x,t) = x^3 e^{-\beta t}$, where $\beta = 0.3\text{sec}^{-1}$. Given that the $P\%$ error in $x = 1.2\%$ and that the % error in $t = 1.6\%$, find the maximum % error in E at $t = 5\text{sec}$.

Ans: 6%

14. Find the rate of change of voltage $\frac{dv}{dt'}$ given I = 0.25 mA.



Ans: 100V/sec.

15. A particle of mass m is projected at angle 60° with horizontal. If initial kinetic energy is KE_0 and kinetic energy at maximum height is $\frac{KE_0}{x}$, find value of x.

Ans: 4

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CHEMISTRY

1. α-helix, β-sheeted protein structure belongs to which category of structure (is explained by)

   a) Primary b) Secondary c) Tertiary d) Quaternary

   Ans: (b)

2. pH of water is 7 at 25°C, then the pH of water at 180°C will _____

   a) Increases b) Decreases

   c) H^+ increases, OH^- decreases d) Remains constant

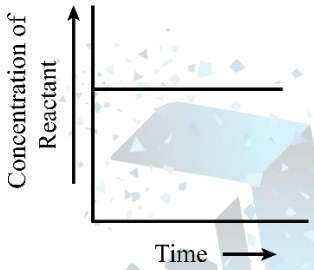
   Ans: (b)

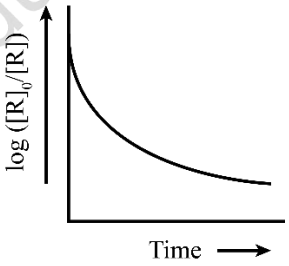
3. The atomic number of the element with least melting point in group 14?

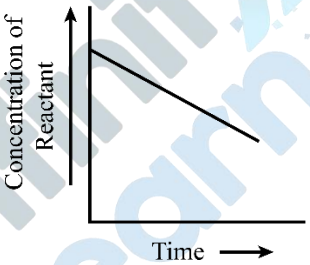
   a) 6 b) 14 c) 50 d) 82

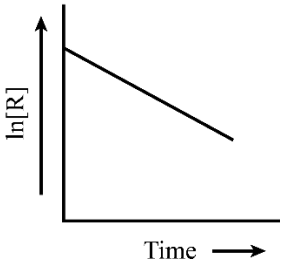
   Ans: (c)

4. Which graph represents zero order reaction?

   a)
   

   b)
   

   c)
   

   d)
   

   Ans: (c)

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5. 81g of Al reacts with 128g of 0_2. Calculate the amount of Al_2O_3 is produced?

a) 164 b) 153 c) 175 d) 181

Ans: (b)

6. Match the following List I with List II.

List-I (Alloys)		List-II (Metals)	
A.	Bronze	(i)	Fe, Cr, and Ni
B	Stainless steel	(ii)	Cu and Sn
C	UK Gold Coin	(iii)	Cu and Zn
D	Brass	(iv)	Ag, Cu, Zn and Ni

a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iii), B-(iv), C-(i), D-(ii)

c) A-(iv), B-(iii), C-(ii), D-(i) d) A-(i), B-(ii), C-(iii), D-(iv)

Ans: (a)

7. By using relation $\Delta G = \Delta H - T\Delta S$, which of the following is incorrect for spontaneous reaction at a given temperature

a) $\Delta H > 0, \Delta S > 0$ b) $\Delta H > 0, \Delta S < 0$ c) $\Delta H < 0, \Delta S > 0$ d) $\Delta H < 0, \Delta S < 0$

Ans: (b)

8. **Statement-I:** For a particular shell, maximum number of orbital is n^2. **Statement-II :** For d-subshell, number of orientation lies between $-l$ to $+l$ including zero.

a) S-I and S-II both are correct

b) S-I and S-II both are incorrect

c) S-I is correct, S-II is incorrect

d) S-I is incorrect, S-II is correct

Ans: (a)

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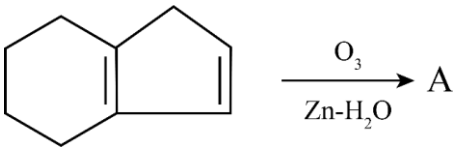
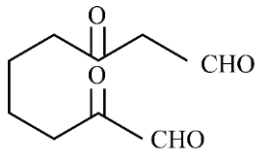
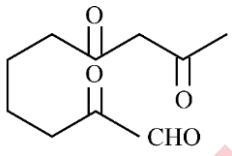
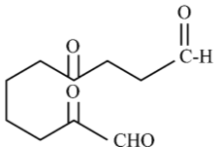
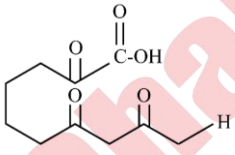
9. 

a) 

b) 

c) 

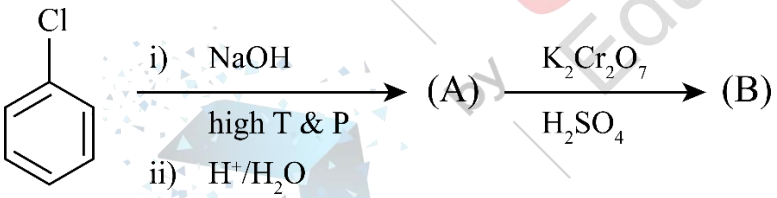
d) 

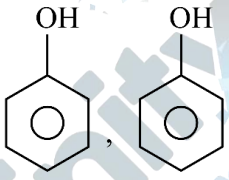
Ans: (a)

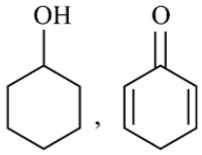
10. The total number of isomers possible (aldehyde & ketones) for C_4H_8O are:-

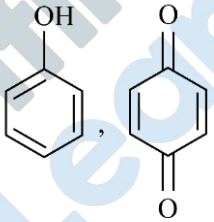
a) 3 b) 4 c) 5 d) 6

Ans: (a)

11. 

a) 

b) 

c) 

d) None of these

Ans: (c)

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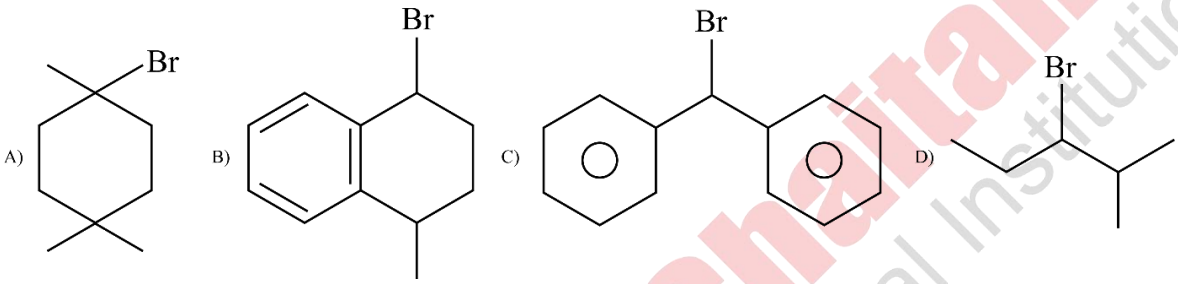
12. Which of the following complex has d^4 configuration?

a) $[Fe(CN)_6]^{3-}$ b) $[MnF_6]^{3-}$ c) $[Co(CN)_6]^{3-}$ d) $[CoCl_4]^{2-}$

Ans: (b)

13. The ascending order of relative rate of solvolysis for following compounds is



a) C > B > A > D b) C > D > A > B

c) A > B > C > D d) B > A > C > D

Ans: (a)

14. Consider the following E° values of given half cell

$E^{\circ}_{Ag^+/Ag} = 0.8\ V, E^{\circ}_{Zn^{2+}/Zn} = -0.76\ V$

$E^{\circ}_{Cu^{2+}/Cu} = 0.34\ V, E^{\circ}_{Mg^{2+}/Mg} = -2.36\ V$

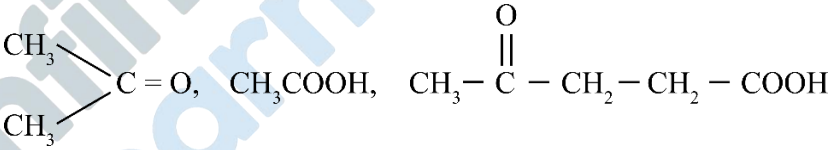
Then which of the following will have the most negative value of ΔG° ?

a) $Zn|Zn^{2+}||Cu^{2+}|Cu$ b) $Mg|Mg^{2+}||Ag^{2+}|Ag$

c) $Mg|Mg^{2+}||Zn^{2+}|Zn$ d) $Cu|Cu^{2+}||Ag^{2+}|Ag$

Ans: (b)

15. A compound X consume two moles of H_2 and when 'X' heated with $KMnO_4/H^+$gives



Number of σ bonds in X are _____.

a) 20 b) 27 c) 18 d) 22

Ans: (b)

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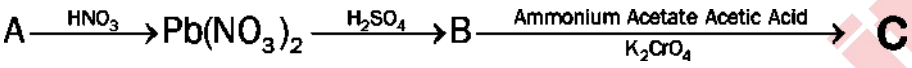
16. When a non-volatile solute (A) is added to a volatile solvent, the vapour pressure of solvent decreases by 10 mm Hg. Mole fraction of solute is 0.2. If second solute (B) is added to the same solution and vapour pressure of solution decreases by 20 mm Hg, calculate mole fraction of second solute in the final solution.

a) 0.3 b) 0.4 c) 0.5 d) 0.6

Ans: (c)

17. 

Find A, B and C

a) $PbSO_4, PbCrO_4, PbCl_2$ b) $PbCl_2, PbSO_4, PbCrO_4$

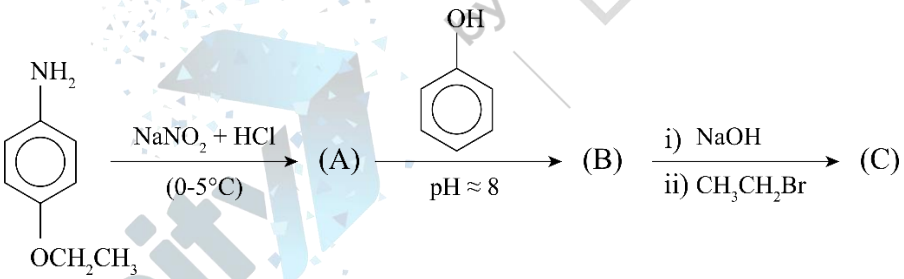
c) $PbSO_4, PbCl_2, PbCrO_4$ d) $PbCl_2, PbCrO_4, PbSO_4$

Ans: (b)

18. 0.01 mole of an organic compound (Hydrocarbon) gives 1.76g CO_2 and 0.9g H_2O on complete combustion. Find out chemical formula of compound

a) C_3H_8 b) C_4H_{10} c) C_5H_{12} d) C_6H_{14}

Ans: (b)

19. 

Number of sp^3 hybridised carbon atoms in C is :

Ans: 4

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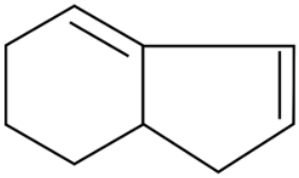
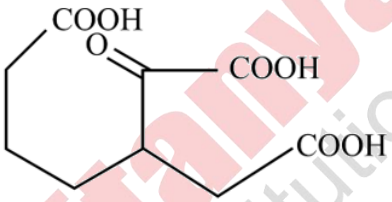
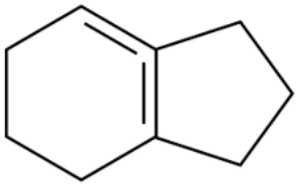
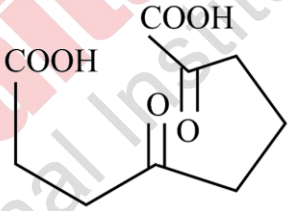
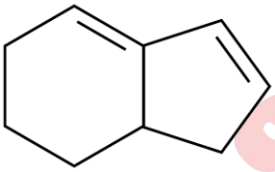
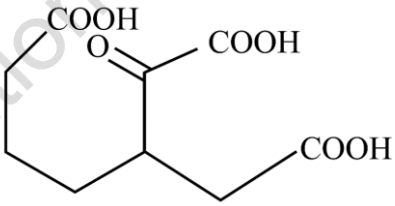
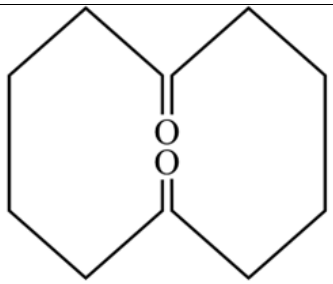
20. Match the following.

	Reactant		Product
(A)		(i)	
(B)		(ii)	
(C)		(iii)	
(D)		(iv)	

Give correct product of oxidative ozonolysis ($0_3/H_20$)

a) A-ii, B-i, C-iii, D-iv

b) A-i, B-ii, C-iii, D-iv

c) A-i, B-ii, C-iv, D-iii

d) A-i, B-iv, C-ii, D-iii

Ans: (b)

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MATHEMATICS

1. If the square of the shortest distance between the lines $\frac{x-2}{1}=\frac{y-1}{2}=\frac{z+3}{-3}$ and $\frac{x+1}{2}=\frac{y+3}{4}=\frac{z+5}{-5}$ is $\frac{m}{n}$, where m,n are coprime numbers then m + n is equal to?

   a) 6 b) 9 c) 14 d) 21

   Ans: (b)

2. $A=(a_{ij})$ Given $A\begin{bmatrix}0\\1\\0\end{bmatrix}=\begin{bmatrix}0\\0\\1\end{bmatrix}, A\begin{bmatrix}4\\1\\3\end{bmatrix}=\begin{bmatrix}0\\1\\0\end{bmatrix}, A\begin{bmatrix}2\\1\\2\end{bmatrix}=\begin{bmatrix}1\\0\\0\end{bmatrix}$ Find (a_{23})

   a) -1 b) -3 c) -5 d) -7

   Ans: (a)

3. The system of equations $x+y+z=6, x+2y+5z=9, x+5y+\lambda z=\mu$ has no solution, find λ

   a) 15 b) 17 c) 11 d) 13

   Ans: (b)

4. Let $\int x^3 \sin x dx = g(x)+c$, where c is the constant of integration of

   $8\left(g\left(\frac{\pi}{2}\right)+g'\left(\frac{\pi}{2}\right)\right)=\alpha\pi^3+\beta\pi^2+\gamma, \alpha,\beta,\gamma \in z$, then $\alpha+\beta-\gamma=$

   a) 48 b) 47 c) 55 d) 62

   Ans: (c)

5. α,β are the roots of $x^2-px+q=0$, are $10^{th,}$ 11^{th} term of $A.P$ of common difference 3/2, Sum of 11 terms = 88 then find, $q-2p=$

   a) 150 b) 123 c) 158 d) 167

   Ans: (c)

6. Consider the terms $8, 21, 34, 47, \ldots .320$. The variance of the given data set is

   a) 8788 b) 8614 c) 720 d) 9402

   Ans: (a)

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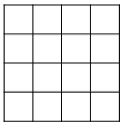
7. Probability of selecting 2 unit squares randomly from given 4 × 4 grid having no two sides common is



a) 3/2 b) 4/5 c) 1/3 d) 1/5

Ans: (b)

8. The distance of the line $\frac{x-2}{2}=\frac{y-6}{3}=\frac{z-3}{4}$ from the point (1,4,0) along the line $\frac{x}{1}=\frac{y-2}{2}=\frac{z+3}{3}$ is

a) $\sqrt{14}$ b) $\sqrt{17}$ c) $\sqrt{13}$ d) $\sqrt{15}$

Ans: (a)

9. If in the expansion of $(1+x)^p(1-x)^q$ the co-efficients of x and x^2 are 1 and -2 respectively then p^2+q^2 is equal to

a) 13 b) 8 c) 18 d) 20

Ans: (a)

10. The length of the chord of the ellipse $\frac{x^2}{4}+\frac{y^2}{2}=1$, what mid point is $\left(1,\frac{1}{2}\right)$ is

a) $\sqrt{15}$ b) $\frac{1}{3}\sqrt{5}$ c) $\frac{2}{3}\sqrt{15}$ d) $\frac{5}{3}\sqrt{15}$

Ans: (c)

11. $I=\int_0^{\frac{\pi}{2}}\frac{\sin^{\frac{3}{2}}x}{\sin^{\frac{3}{2}}x+\cos^{3/2}x}dx$ then $I=\int_0^{\frac{\pi}{2}}\frac{x\sin x\cos x}{\sin^4 x+\cos^4 x}dx$ equals

a) $\frac{\pi^2}{3}$ b) $\frac{\pi^2}{5}$ c) $\frac{\pi^2}{9}$ d) $\frac{\pi^2}{16}$

Ans: (d)

12. When 5 boys and 4 girls to be arranged in a row then the number of ways arranging no two boys together or all boys sit together

a) 18000 b) 17280 c) 2000 d) 12000

Ans: (b)

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13. $\lim_{x\to\infty} \frac{(2x^2-3x+5)(3x-1)^{\frac{x}{2}}}{(3x^2+5x+4)\sqrt{(3x+2)^x}}$ is equal to

a) $\frac{2}{\sqrt{3e}}$ b) $\frac{2e}{\sqrt{3}}$ c) $\frac{2}{3\sqrt{e}}$ d) $\frac{ze}{3}$

Ans: (c)

14. Let $f(x) = 6 + 16\cos\left(\frac{\pi}{3}-x\right)\cos\left(\frac{\pi}{3}+x\right)\cos x \sin 3x \cos 6x$ if range of $f(x)$ is $[\alpha, \beta]$ then distance of (α, β) from $3x + 4y + 12 = 0$ is

a) 11 b) 12 c) 13 d) 14

Ans: (a)

15. Let S be the region consisting of points (x, y) such that $-1 \le x \le 1$ and $0 \le y \le a + e^{|x|} - e^{-|x|}$ if area bounded by region is $2\left(\frac{e^2+8e+1}{e}\right)$ find 'a'.

a) 9 b) 10 c) 11 d) 9/5

Ans: (b)

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