

# **JEE MAIN 2025 SESSION-2 SHIFT-2 EVENING**



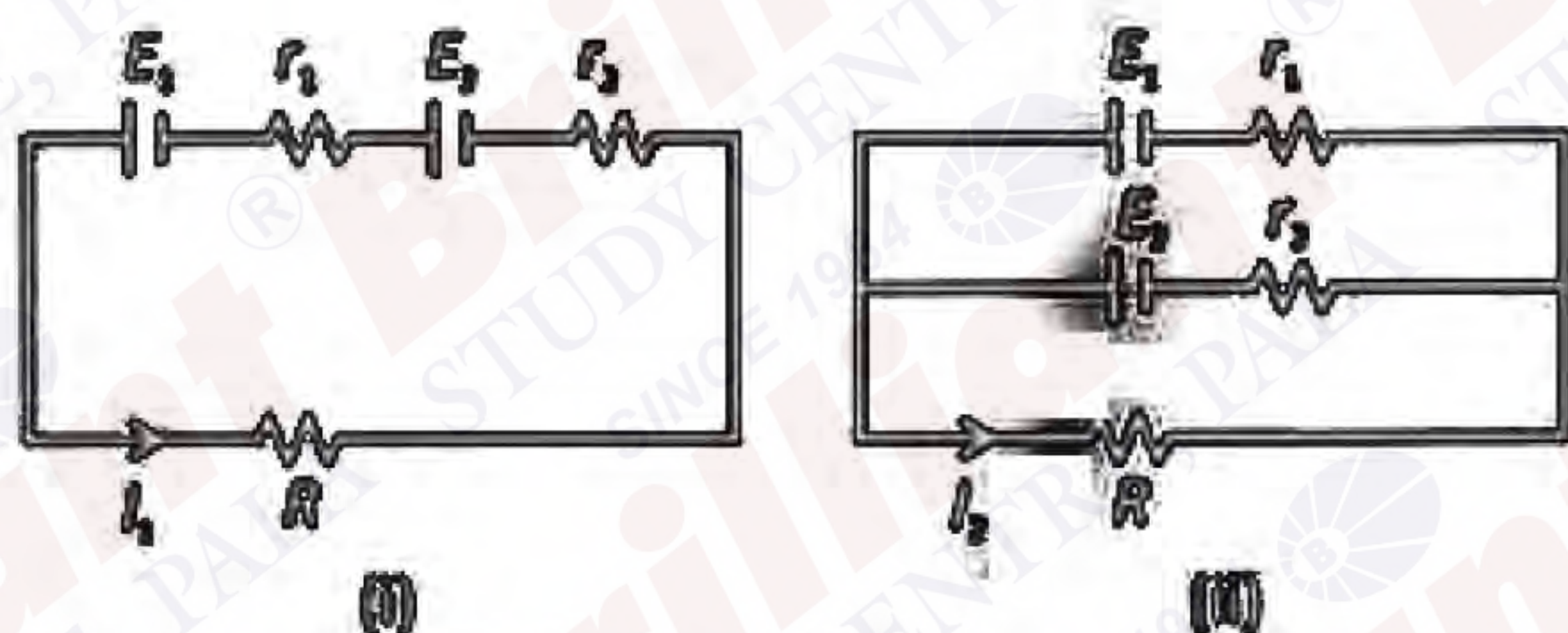
SCAN ME

## **VIDEO SOLUTION**

## **MEMORY BASED QUESTIONS**

- The ratio of intensities of two coherent is 1:9. The ratio of the maximum to the minimum intensities is  
 1) 9:1                      2) 16:1                      3) 8:1                      4) 4:1
- Excess pressure inside bubble A is half of that of bubble B. Find ratio of bubble A to bubble B.  
 1) 8                      2) 4                      3) 27                      4) 16
- In a resonance tube experiment at one end, resonance is obtained at two consecutive lengths  $l_1 = 100\text{cm}$  and  $l_2 = 140\text{cm}$ . If the frequency of the sound is 400Hz, the velocity of sound is  
 1) 320m/s                      2) 340m/s                      3) 380m/s                      4) 300m/s
- Physical quantity S is given as  $S = \frac{pq}{r^3\sqrt{t}}$ . Find to percentage change in S if percentage change in p,q,r and t are 1,1,3 and 2 respectively  
 1) 7%                      2) 9%                      3) 5%                      4) 12%
- Medium of refractive index 2, the frequency of light is  $5 \times 10^{14}\text{Hz}$ , the wavelength of the light is  
 1) 100nm                      2) 300nm                      3) 500nm                      4) 600nm
- A capacitor  $C_1 = 100\text{pF}$  is connected to a 60V cell then disconnected.  $C_1$  is now connected to an unchanged capacitor  $C_2$  such that the final potential across  $C_1$  becomes 20V. Find  $C_2$   
 1) 200nm                      2) 300nm                      3) 500nm                      4) 600nm
- A bulb rated 100W, 220V connected to an ac supply of 200V. Find peak current in the bulb  
 1) 8A                      2) 0.64A                      3) 3.2A                      4) 2A
- Statement -I:  $\text{O}^{2-}$  and  $\text{H}^+$  are projected in a magnetic field perpendicular to the field with same speed. The radius of curvature of  $\text{O}^{2-}$  will be less tha  $\text{H}^+$ .  
 Statement - II:  $\text{e}^-$  and  $\text{p}^+$  are projected in a magnetic field perpendicular to the field with same speed. The radius of curvature of  $\text{e}^-$  will be more the proton.  
 1) Statement - I is correct, statement - II is incorrect  
 2) Both statement - I and statement - II are correct  
 3) Both statement - I and statement - II are incorrect  
 4) statement -I is incorrect, statement -II is correct
- In two situations given in figures (i) and (ii) current through R is  $I_1$  and  $I_2$  respectively.

If  $E_1 = 2\text{V}$ ,  $r_1 = 1\Omega$ ,  $E_2 = 1\text{V}$ ,  $r_2 = 2\Omega$ ,  $R = 6\Omega$  then find  $\frac{I_1}{I_2}$



- 1)  $\frac{3}{4}$
- 2)  $\frac{4}{3}$
- 3)  $\frac{9}{4}$
- 4)  $\frac{4}{9}$

10. A block of mass 10kg is moving with speed 3m/s collides with a spring connected to another block of mass 5kg initially at rest. Find the compression in spring when both move with same speed



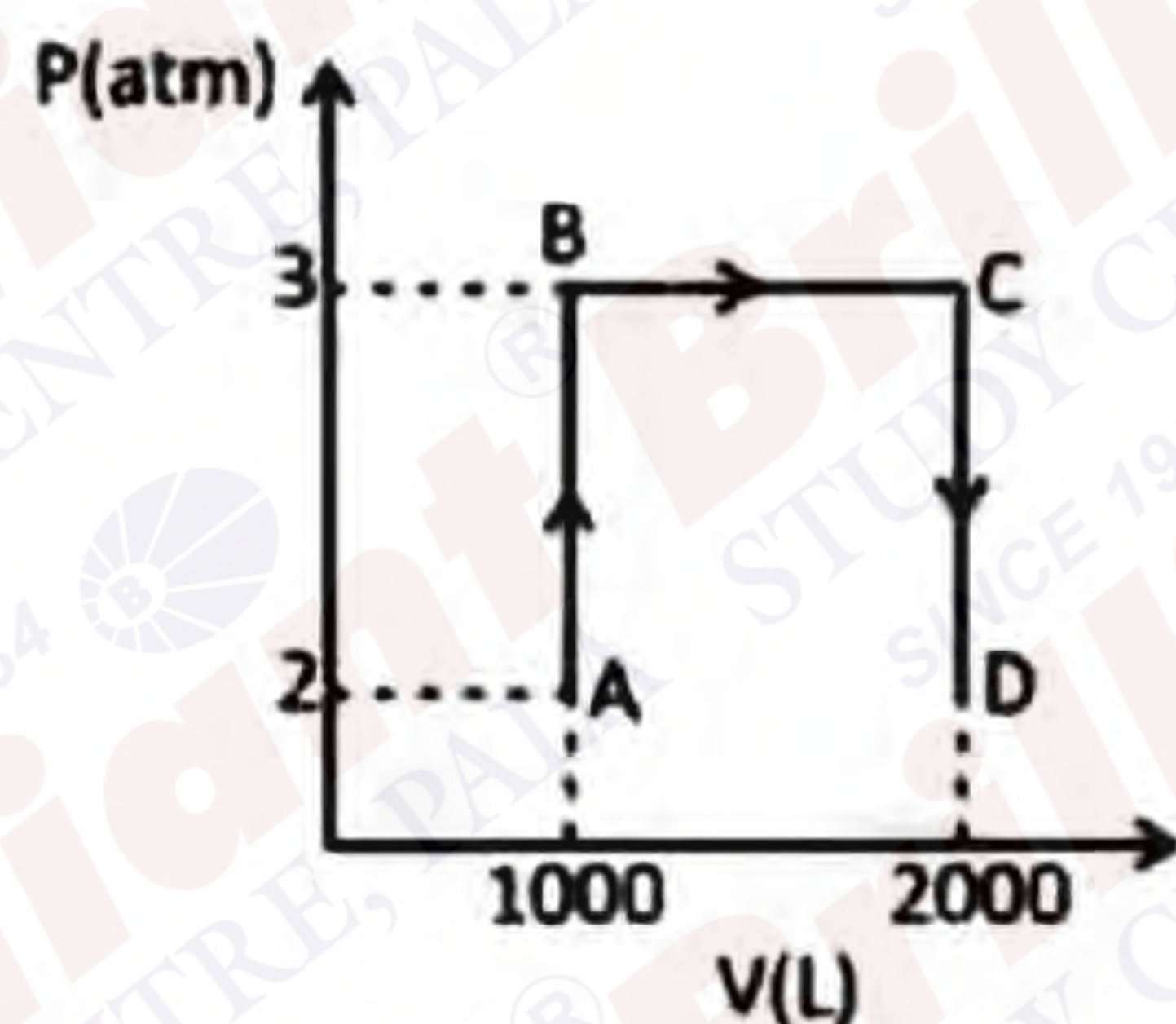
1) 0.1m

2) 0.2m

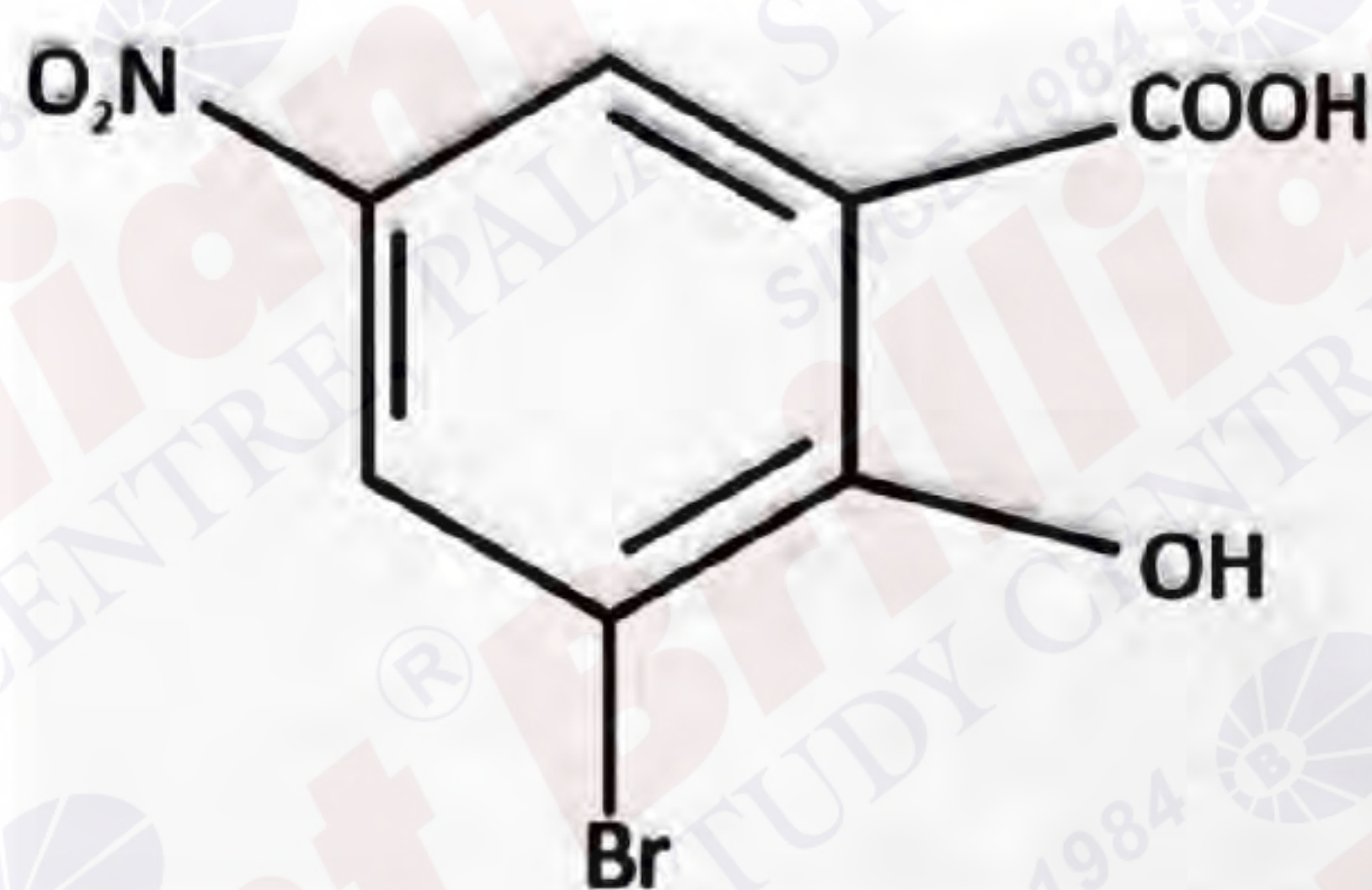
3) 1m

4) 2m

1. Find out magnitude of work done in the process ABCD (in kj) (1 atm. Lit = 101.3J)



2. Amount of magnesium (Mg)(in mg) required to liberate 224mL of  $H_2$  gas at STP, when reacted with HCl.
3. Among Sc, Ti, Mn and Co, Calculate the spin only magnetic moment in +2 oxidation state of metal having highest heat of atomisation.
4. The correct IUPAC name of the given compound is:



5. At 715 mm pressure, 300K, volume of  $N_2(g)$  evolved was 80 mL by a 0.4g sample of organic compound. Find % of N in organic compound Aq. tension at 300K = 15mm
6. **Statement-I :**  $O^{2-}$  and  $H^+$  are projected in a magnetic field perpendicular to the field with same speed. The radius of curvature of  $O^{2-}$  will be less than  $H^+$ .
- Statement-II :**  $e^-$  and  $p^+$  are projected in a magnetic field perpendicular to the field with same speed. The radius of curvature of  $e^-$  will be more the proton.

- 1 Statement-I is correct, statement-II is incorrect
- 2 Both statement-I and statement-II are correct
- 3 Both statement-I and statement-II are incorrect
- 4 Statement-I is incorrect, statement-II is correct

7. Match the following list-I with list-II :

**List-I (Groups)**

- (A) Pnictogens
- (B) Chalcogens
- (C) Halogens
- (D) Noble gases

**List-II (Elements)**

- (I) Rn
- (II) At
- (III) Te
- (IV) Bi

1 A-I, B-II, C-III, D-IV

2 A-IV, B-III, C-II, DI

3 A-IV, B-II, C-III, D-I

4 A-I, B-III, C-II, D-

8. Find orbital angular momentum for 2s and 2p energy levels

9. Find orbital angular momentum for 2s and 2p energy levels

**QN** Let  $y = y = f(x)$  be the solution of the differential equation  $\frac{dy}{dx} + 3y \tan^2 x + 3y = \sec^2 x$

such that  $f(0) = \frac{e^3}{3} + 1$ , then  $f\left(\frac{\pi}{4}\right)$  is equal to

- 1)  $(1 + e^{-3})$       2)  $\frac{2}{3}\left(1 + \frac{1}{e^3}\right)$       3)  $\frac{1}{3}\left(1 - \frac{1}{e^3}\right)$       4)  $\frac{1}{3}\left(1 + \frac{1}{e^3}\right)$

**QN**  $S = 1 + \frac{1+3}{1!} + \frac{1+3+5}{2!} + \dots \infty$  the value of S is equal to

- 1)  $4e - 2$       2)  $4e$       3)  $5e$       4)  $7e$

**QN**  $I = \int_0^\pi \frac{8x}{4\cos^2 x + \sin^2 x} dx$  equals to

- 1)  $\pi^2$       2)  $4\pi^2$       3)  $2\pi^2$       4)  $\frac{3}{2}\pi^2$

**QN** Let a circle C with radius r passes through four distinct points (0, 0) (k, 3k), (2, 3) and (-1, 5), such that  $k \neq 0$ , then  $(10k + 2r^2)$  is equal to

- 1) 35      2) 34      3) 27      4) 32

**QN** Let  $A = \{-3, -2, -1, 0, 1, 2, 3\}$ . A relation R is defined such that  $xRY$  iff  $y = \max\{x, 1\}$ . Number of elements required to make it reflexive is I, number of elements required to make it symmetric as m and number of elements in the relation R is n. Then value of  $I + m + n$  is equal to

**QN** If  $\lim_{x \rightarrow 0} \left( \frac{\tan x}{x} \right)^{\frac{1}{x^2}} = p$ , then  $96 \ln p$  is

**QN** If  $(1 + x + x^2)^{10} = 1 + a_1x + a_2x^2 + \dots$ , then  $(a_1 + a_3 + a_5 + \dots + a_{19}) - 11a_2$  equals to

**QN** Area bounded by  $|x - y| \leq y \leq 4\sqrt{x}$  is equal to (in sq units)

- 1)  $\frac{2048}{3}$       2)  $\frac{1024}{3}$       3)  $\frac{512}{3}$       4)  $\frac{128}{3}$

**QN** Let  $A(z_1)$ ,  $B(z_2)$  and  $C(z_3)$  are the vertices of an equilateral triangle. If  $z_0$  is the centroid of triangle ABC and  $|z_1 - z_2| = 1$ , then the value of  $\sum_{i=1}^3 |z_i - z_0|^2$  equal to

- 1) 1      2) 2      3) 3      4) 9

**QN** If  $f(x) = ||x + 2| - 2|x||$ , then number of points of local maxima and local minima is

- 1) 5      2) 3      3) 2      4) 7

**QN**  $x(x - 2)(12 - k) = 2$  has both roots same. The distance of  $\left(k, \frac{k}{2}\right)$  from the line  $3x + 4y + 5 = 0$  is

- 1) 24      2) 14      3) 15      4) 20

**QN** The shortest distance between the parabola  $y^2 = 8x$  and the circle  $x^2 + y^2 + 12y + 35 = 0$  is

1)  $(2\sqrt{2} - 1)$  units

2)  $(\sqrt{2} - 1)$  units

3)  $(2\sqrt{2} + 1)$  units

4)  $(\sqrt{2} + 1)$  units

**QN** The quadratic equation  $x^2 - 2(k - 12)x + k - 12 = 0$  has equal roots for two values of  $k$  i.e.  $k_1$  and  $k_2$  where  $k_1 > k_2$ . Find the distance of points  $(k_1, k_2)$  from the line  $3x + 4y + 2 = 0$

**QN** The minimum distance between  $y^2 = 8x$  and  $x^2 + y^2 + 12x + 35 = 0$  is equal to -----

**QN** Let  $f(x) = \log_4(1 - \log_7(x^2 - 8))$ . If the domain of  $f(x)$  is  $(\alpha, \beta) \cup (\gamma, \delta)$ . Then  $\alpha + \beta + \gamma + \delta$  equals to

1) 18

2) 27

3) 21

4) 9