

FIITJEE
ALL INDIA TEST SERIES
JEE (Advanced)-2025
OPEN TEST – I
PAPER –2
TEST DATE: 09-02-2025

Time Allotted: 3 Hours

Maximum Marks: 180

General Instructions:

- The test consists of total 51 questions.
- Each subject (PCM) has 17 questions.
- This question paper contains **Three Parts**.
- **Part-I** is Physics, **Part-II** is Chemistry and **Part-III** is Mathematics.
- Each **Part** is further divided into **Three Sections: Section-A, Section-B & Section-C**.
Section – A (01 – 04, 18 – 21, 35 – 38): This section contains **TWELVE (12)** questions. Each question has **FOUR** options. **ONLY ONE** of these four options is the correct answer.
Section – A (05 –07, 22 – 24, 39 – 41): This section contains **NINE (09)** questions. Each question has **FOUR** options. **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
Section – B (08 – 13, 25 – 30, 42 – 47): This section contains **EIGHTEEN (18)** numerical based questions. The answer to each question is a **NON-NEGATIVE INTEGER VALUE**.
Section – C (14 –17, 31 – 34, 48 – 51): This section contains **SIX (06) paragraphs**. Based on each paragraph, there are **TWO (02)** questions of numerical answer type. The answer to each question is a **NUMERICAL VALUE (XXXXX.XX)**. If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places.

MARKING SCHEME

Section – A (Single Correct): Answer to each question will be evaluated according to the following marking scheme:

Full Marks	:	+3	If ONLY the correct option is chosen.
Zero Marks	:	0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	:	-1	In all other cases.

Section – A (One or More than One Correct): Answer to each question will be evaluated according to the following marking scheme:

Full Marks	:	+4	If only (all) the correct option(s) is (are) chosen;
Partial Marks	:	+3	If all the four options are correct but ONLY three options are chosen;
Partial marks	:	+2	If three or more options are correct but ONLY two options are chosen and both of which are correct;
Partial Marks	:	+1	If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks	:	0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	:	-2	In all other cases.

Section – B: Answer to each question will be evaluated according to the following marking scheme:

Full Marks	:	+4	If ONLY the correct integer is entered;
Zero Marks	:	0	Question is unanswered;
Negative Marks	:	0	In all other cases.

Section – C: Answer to each question will be evaluated according to the following marking scheme:

Full Marks	:	+3	If ONLY the correct integer is entered;
Zero Marks	:	0	Question is unanswered;
Negative Marks	:	0	In all other cases.

Physics

PART – I

SECTION – A

(One Options Correct Type)

This section contains **FOUR (04)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.

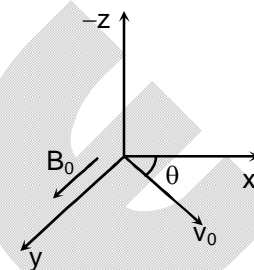
- A uniform magnetic field exists in region along y-axis. A charge $+q$ is projected at origin in xy plane with velocity v_0 at $t = 0$ as shown. Choose the correct option for motion of charge. ($\theta \neq 0$)

(A) x and z coordinate of position of charge can not be zero at same time ($t > 0$)

(B) If speed v_0 is increased, charge will take more time to have its x-coordinate to be zero for the first time after $t = 0$.

(C) If θ is increased keeping speed v_0 constant, charge will take same time to meet y-axis after $t > 0$.

(D) all of the above



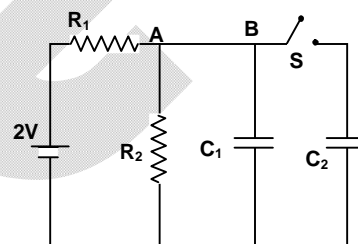
- Initially the switch 'S' is open for a long time. Now the switch 'S' is closed at $t = 0$ ($R_1 = 2\Omega$, $R_2 = 2\Omega$, $C_1 = 1F$ and $C_2 = 1F$). Then, choose the incorrect statement.

(A) The current through the wire AB at $t = 2$ sec is $1/2e$ ampere.

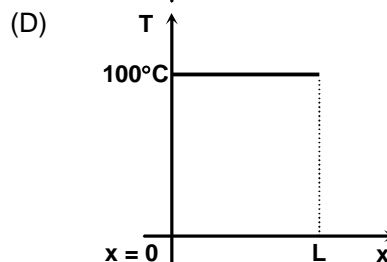
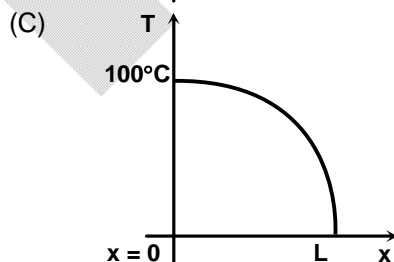
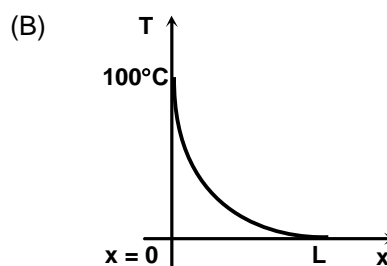
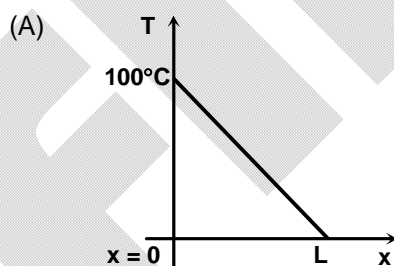
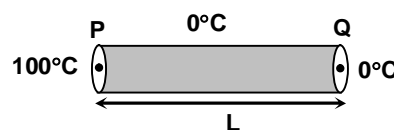
(B) The current through the wire AB at $t = 2$ sec is $1/e$ ampere.

(C) The charge on the capacitor C_2 , which was initially uncharged, at $t = 2$ sec is $\left(1 - \frac{1}{2e}\right)$ coulombs.

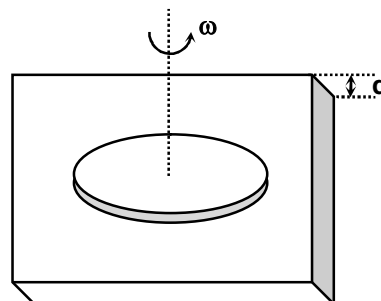
(D) The charge on the capacitor C_1 at $t = 2$ sec is $\left(1 - \frac{1}{2e}\right)$ coulombs.



- A conducting rod of length 'L' cross-sectional area 'A' and thermal conductivity 'k' is kept in the surrounding at 0°C . The end P is maintained at 100°C and Q at 0°C . The graph between temperature (T) of the rod and distance (x) from the end 'P' is best represented by



4. A disc of radius R which is brought in contact with an oil film on a horizontal surface is rotated with a constant angular velocity ω about its vertical axis. The coefficient of viscosity of oil is η and the thickness of the oil film is d . Find the power delivered by the external agent to rotate the disc. (Assume velocity gradient to be uniform)



- (A) $\frac{\pi\omega^2\eta R^4}{2d}$ (B) $\frac{\pi\omega^2\eta R^4}{d}$
 (C) $\frac{\pi\omega^2\eta R^2}{2d}$ (D) $\frac{2\pi\omega^2\eta R^4}{d}$

SECTION – A

(One or More than one correct type)

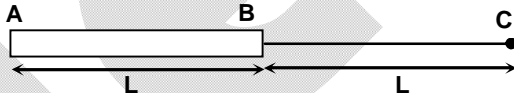
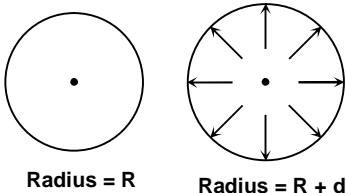
This section contains **THREE (03)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct answer(s).

5. h , G , S , η , μ_0 and ϵ_0 are the plank constant. Gravitational constant, surface tension, coefficient of viscosity, permeability and permittivity of free space respectively. $[M]$, $[L]$, $[T]$ and $[A]$ denote the fundamental dimension of mass, length, time and current respectively. Regarding the dimension of some physical quantity choose the correct option(s).
- (A) Dimension of $\frac{hG}{\eta^2}$ is $[M^{-1}L^7T^{-1}]$
 (B) Dimension of $\frac{\mu_0}{Sh}$ is $[M^{-1}L^{-1}T^{-1}A^{-2}]$
 (C) Dimension of $\frac{hG}{\epsilon_0}$ is $[ML^8T^{-7}A^{-2}]$
 (D) Dimension of $\frac{S\epsilon_0}{\eta}$ is $[M^{-1}L^{-2}T^3A^2]$
6. Living wood takes radioactive carbon from the atmosphere during the process of photo synthesis. The proportion of C^{14} and C^{12} being 8×10^{-14} . When wood dies C^{14} decays with half life 2.1×10^9 s. 4g of carbon from a piece of dead wood gave a total count of 20 disintegrations per minute. Then, (Take $N_a = 6 \times 10^{23}$, $\ln 2 = 0.7$)
- (A) Age of wood is 8.4×10^9 s.
 (B) Age of wood is 6.3×10^9 s.
 (C) Number of C^{14} at present in the wood piece is 10^9
 (D) Number of C^{14} at present in the wood piece is 10^{10}
7. A particle is moving in a conservative field and its potential energy is given as $U = (6x - 8y)$ J, where x and y co-ordinates are in meters. Particle has initial velocity $(2\hat{i} - 3\hat{j})$ m/s at origin. (Given: mass of the particle is 2 kg)
- (A) Speed of the particle will not be zero for any time t .
 (B) At $t = 2$ sec, the angle between velocity and acceleration of particle is $\cos^{-1}\left(\frac{32}{5\sqrt{41}}\right)$
 (C) When the particle crosses x axis, $x = -\frac{3}{8}$ m
 (D) In a moment of time particle velocity will be perpendicular to acceleration, at $t = \frac{18}{25}$ sec.

SECTION – B

(Numerical Answer Type)

This section contains **SIX (06)** Numerical based questions. The answer to each question is a **NON-NEGATIVE INTEGER VALUE**.

8. A tube of length ℓ and radius R carries a steady flow of a liquid of density ρ and viscosity η . The velocity of flow of the liquid depends on the radial distance 'r' from the axis of the tube as $v = v_0 \left(1 - \frac{r^2}{R^2}\right)$. If the pressure difference at the two ends of the tube is $k \left(\frac{\eta \ell v_0}{6R^2}\right)$. The value of k is.....
9. In a setup of displacement method experiment, the distance between the screen and a light source is 120 cm and the lens used has a small aperture. By moving the lens between the source and the screen, sharp images are obtained on the screen for two different positions of the lens. The ratio of sizes of these two images is 9 : 1. The separation between the two different positions of the lens is x cm. Find $\frac{x}{10}$.
10. A rod AB of mass M and length L is fixed. A point mass is released from point C as shown in the figure. Point mass starts moving towards rod when set free. The speed of the point mass was found to be $v = \sqrt{\frac{xGM}{L} \ell \left(\frac{y}{2}\right)}$, when point mass is at a distance of $\frac{L}{2}$ from end B. Find $x + y$.
- 
11. A uniform solid ring of mass m and radius R is made of an elastic material. The symmetric radially outward force acting per unit length on the ring is F as shown by arrows in the figure. To increase the radius of the ring from R to $(R + d)$, the magnitude of F required is $\frac{kAdY}{6R^2}$. Find the value of k . (Young's modulus of the material of ring is Y and area of its cross section is A)
- 
12. A cart moves with uniform velocity on a muddy road. The radius of the wheel is $R = 0.6$ m. The wheel of the cart does not slip on the road. A small bit of mud detaches from the rim at a height $h = \frac{3R}{2}$ from the ground. The speed of cart (in m/s) is $2\sqrt{x}$ if the bit of mud falls back on the wheel at the same height. Find x . (Take $g = 10 \text{ m/s}^2$, $\sqrt{3} = 1.73$)
13. The refracting angle of a prism is 60° . What should be the minimum value of the refractive index of the material from which the prism is to be made so that light cannot emerge from the second refracting surface.

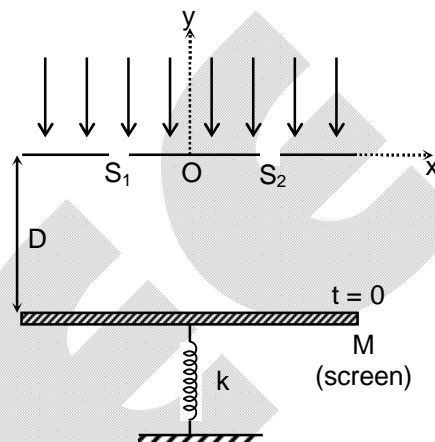
SECTION – C

(Numerical Answer Type)

This section contains **TWO (02) paragraphs**. Based on each paragraph, there are **TWO (02)** questions of numerical answer type. The answer to each question is a **NUMERICAL VALUE (XXXXX.XX)**. If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places.

Paragraph for Question Nos. 14 and 15

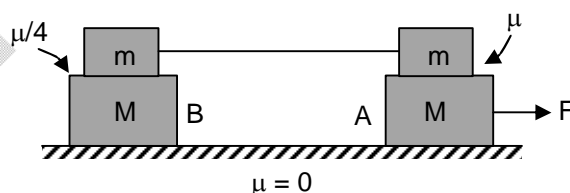
A monochromatic light of wavelength ' λ ' is incident on two slits S_1 and S_2 made on x-axis. The mid point of the line S_1S_2 is considered as origin and 'd' is the distance between the two slits which are symmetric about y-axis. The interference pattern is observed on a plate of mass M which is acting as a screen. The screen is attached to one end of a vertical spring of spring constant 'k' and the other end of spring is attached with the ground. Spring is massless and screen always remains in horizontal plane. The distance between the plane of slits and the screen is D ($D \gg d$). Assuming S_1 and S_2 are coherent in nature. At $t = 0$, screen is released and spring is in its natural length. It is given that $M = 1\text{ kg}$, $k = 1\text{ N/m}$, $D = \frac{5Mg}{k}$, $g = 10\text{ m/s}^2$, $d = 100\lambda$. The x co-ordinate (in cm) of the first order maxima on the screen as a function of time is given by $\pm(\lambda_1 - \lambda_2 \cos t)$.



14. The value of λ_1 is
15. The value of λ_2 is

Paragraph for Question Nos. 16 and 17

In the figure shown, when a horizontal force F is applied to the larger block A, all the four blocks move together. There is no slipping between any two blocks. (Take $m = 1\text{ kg}$, $M = 2\text{ kg}$, $\mu = 0.4$ and $g = 10\text{ m/s}^2$)



16. The maximum value of the applied horizontal force F (in newton) is
17. In the above case, the friction force (in newton) between the front blocks is

Chemistry

PART – II

SECTION – A

(One Options Correct Type)

This section contains **FOUR (04)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.

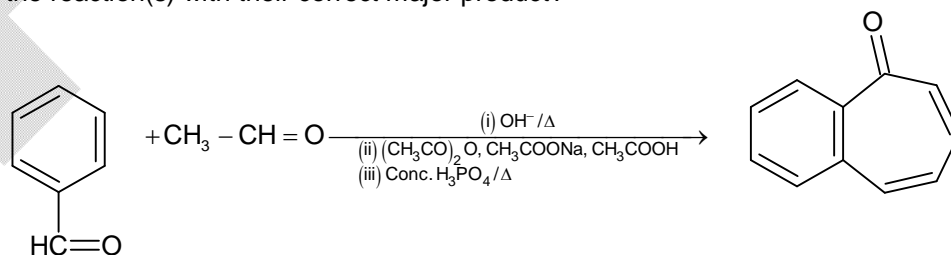
18. Identify the **INCORRECT** statement of the following:
 (A) The mineral kionite ($\text{Ca}_2\text{Cu}_2\text{Si}_3\text{O}_{10} \cdot 2\text{H}_2\text{O}$) is a chain silicate.
 (B) HF is used as etching agent in glass industry.
 (C) In the titration of Fe^{3+} with Sn^{2+} , KCNS can be used as a suitable indicator.
 (D) On reaction of red lead with conc. HCl, a golden yellow gas is evolved.
19. For osazone formation the effective structural unit necessary is
 (A) $\begin{array}{c} \text{CH}_2\text{OCH}_3 \\ | \\ \text{CO} \\ | \end{array}$ (B) $\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CO} \\ | \end{array}$
 (C) $\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CHOCH}_3 \\ | \end{array}$ (D) $\begin{array}{c} \text{CHO} \\ | \\ \text{CHOCH}_3 \\ | \end{array}$
20. A polyvalent metal weighing 0.1 g and atomic weight 51 reacted with dil. H_2SO_4 to evolve 43.9 ml of H_2 at STP. This solution containing metal in lower oxidation state was found to require 58.8 ml of 0.1 N permanganate for complete oxidation. Identify the higher oxidation state of the metal.
 (A) +2 (B) +3
 (C) +5 (D) +7
21. Electrolysis of dil. H_2SO_4 generates perdisulphuric acid ($\text{H}_2\text{S}_2\text{O}_8$). Using 75% efficiency, what current needs to be passed to produce the desired product at the rate of 1 mole per hour.
 (A) 17 amp. (B) 71 amp.
 (C) 17 m. amp. (D) 71 m. amp.

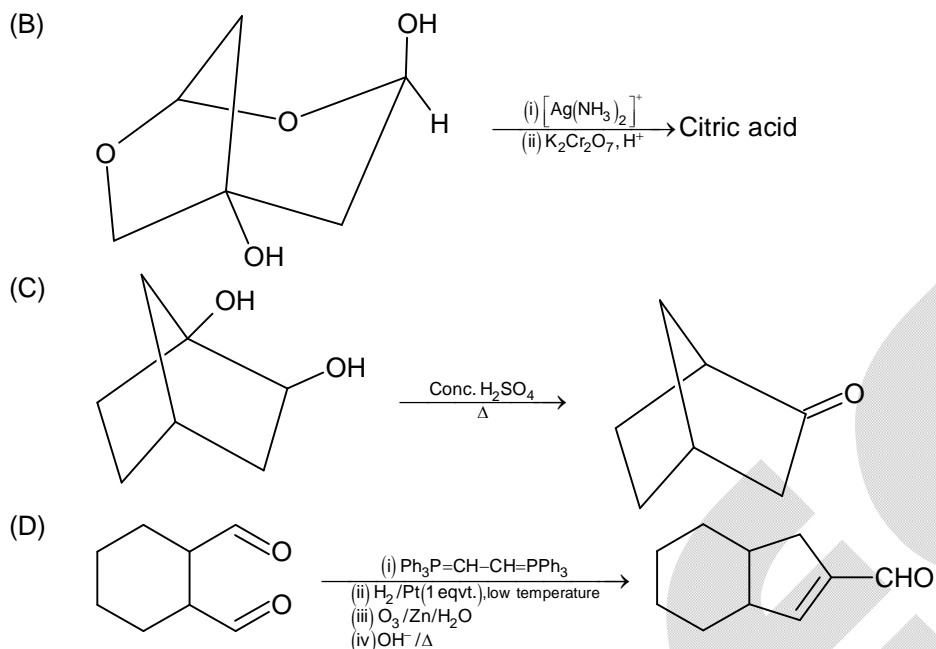
SECTION – A

(One or More than one correct type)

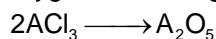
This section contains **THREE (03)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct answer(s).

22. Identify the reaction(s) with their correct major product?
 (A)



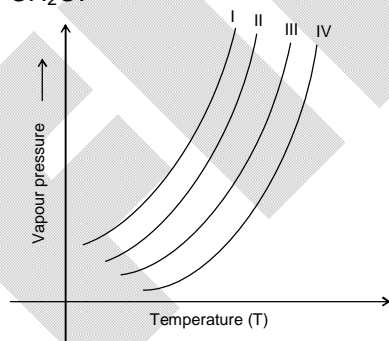


23. $AlCl_3$ is an unstable compound and gradually changing into A_2O_5 by its reaction with atmospheric oxygen, according to the following partial reaction:



The above reaction follows second order kinetics. The reaction is started by taking 1 mole of $AlCl_3$ in a container of volume 1 L and allowed to stand for some time. After 10 min, the reaction mixture requires 250 mL of 0.8 M acidified $KMnO_4$ solution; where $AlCl_3$ is oxidized into AlO_3^- and assume A_2O_5 do not react with $KMnO_4$. Now, choose the correct statement(s) of the following:

- (A) Half-life time of the reaction is 10 minutes.
 (B) Rate constant of the reaction is $0.05 \text{ l mol}^{-1} \text{ min}^{-1}$.
 (C) Rate constant of the reaction is $0.10 \text{ l mol}^{-1} \text{ min}^{-1}$.
 (D) After 20 mins from the start, 33.33% of $AlCl_3$ is left unreacted.
24. The following diagram shows the vapour pressure curves for CH_3F , CH_3OH , CH_3COOH and CH_2O .



Now choose the correct match from the options given below:

- (A) III = CH_3OH
 (B) II = CH_3F
 (C) I = CH_2O
 (D) IV = CH_3COOH

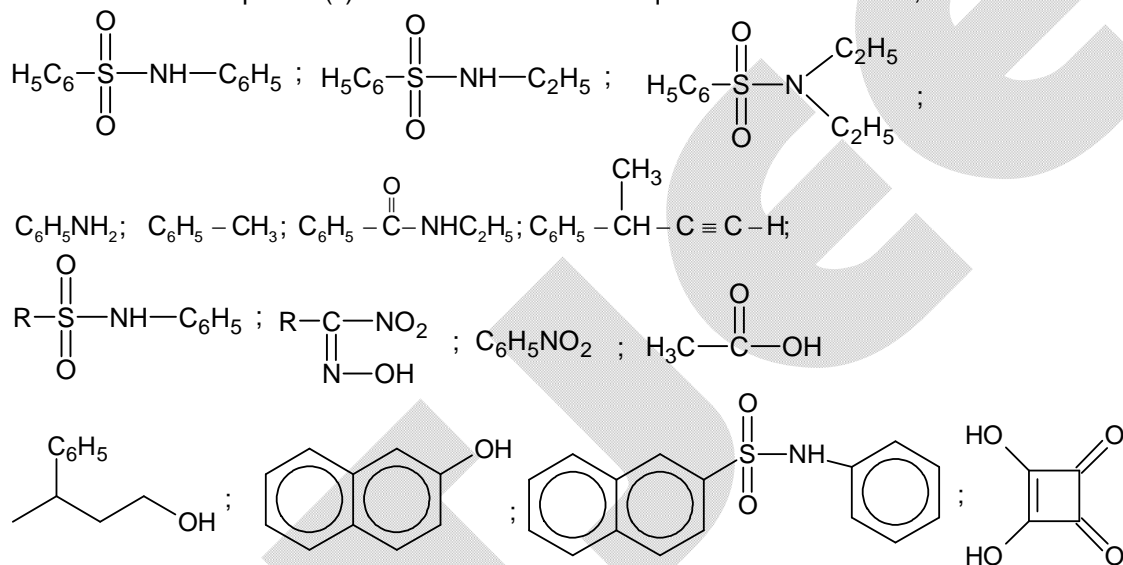
SECTION – B

(Numerical Answer Type)

This section contains **SIX (06)** Numerical based questions. The answer to each question is a **NON-NEGATIVE INTEGER VALUE**.

25. Among the following, total number of compound(s) which produce oxygen as the only gaseous product on gentle heating, is/are....
 NaNO_2 , KNO_3 , Ag_2O , $\text{Ca}(\text{NO}_3)_2$, KClO_3 , HgO ,
 CaO , Na_2O , NaNO_3 , $\text{Ba}(\text{NO}_3)_2$, H_2O_2 .

26. The number of compound (s) which is/are soluble in aqueous NaOH solution, is/are



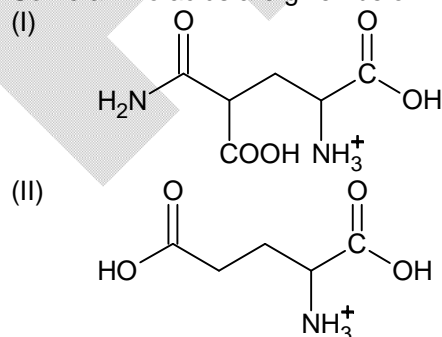
27. $\text{CH}_2=\text{C}=\text{CH}_2 \xrightarrow{\text{H}_3\text{O}^+} (\text{X}) \xrightarrow[\Delta]{\text{conc. H}_2\text{SO}_4} (\text{Y})$
 (Major product) (Major product)

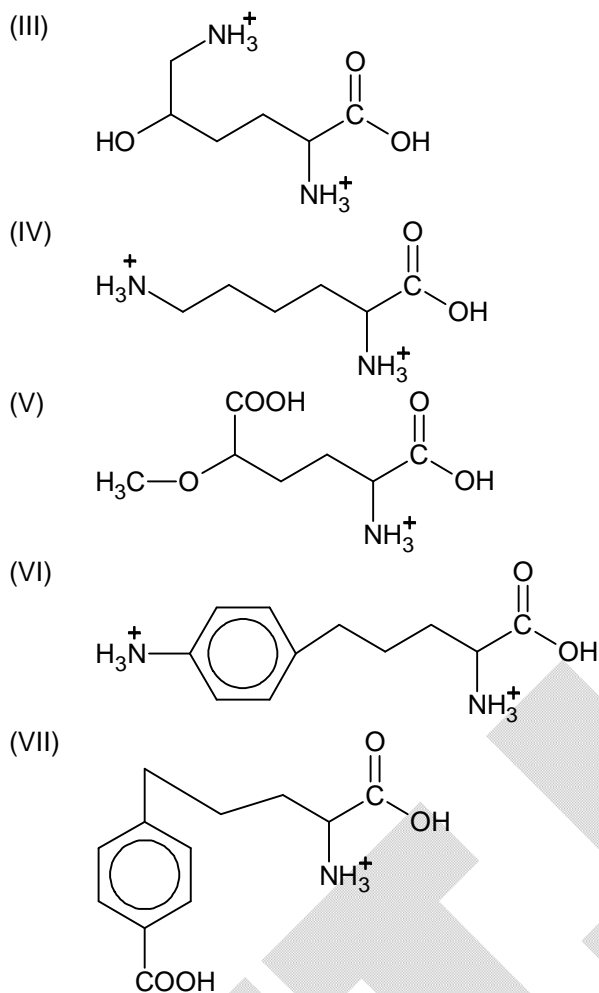
Ratio of the total number of sigma bonds to that of pi bonds in a molecule of (Y) is.....

28. Suppose your weight is 80 kg and you want to fly in the sky with the help of balloons each containing 50 moles of H_2 gas at 0.5 atm and 27°C . If 'x' is the minimum number of balloons that you need to attach with yourself to fly, then the value of 'x' is:

[Given: density of air = 1.25 g/L and it remains constant throughout. Also, neglect the weight of balloon]

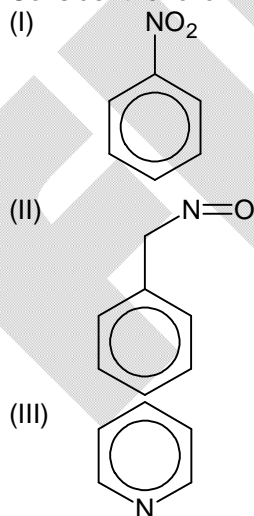
29. Some amino acids are given below:

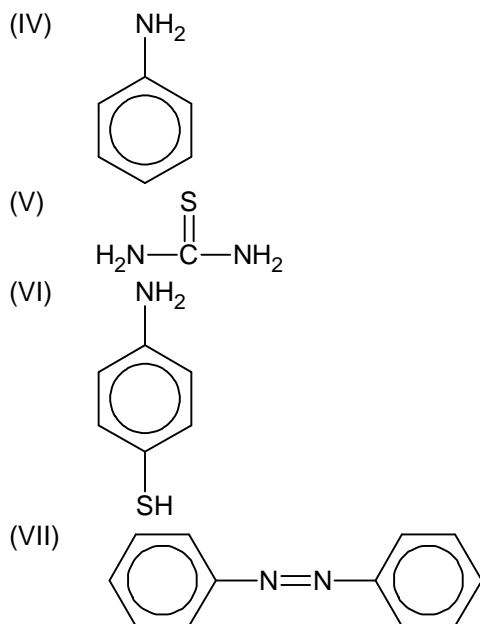




Let, the number of amino acids which exists as cation at pH = 7 be 'x' and the number of amino acids which exists as anion at pH = 7 be 'y', then find the value of x.y.

30. Consider the following compounds:





Let, the compound(s) which cannot be Kjeldahlised be 'x'
 the compound(s) which gives blue colour in Lassaigne's test of nitrogen be y and
 the compound(s) which gives red colour in Lassaigne's test of nitrogen be z.
 So, the value of $x + y + z$ will be:

SECTION – C (Numerical Answer Type)

This section contains **TWO (02) paragraphs**. Based on each paragraph, there are **TWO (02)** questions of numerical answer type. The answer to each question is a **NUMERICAL VALUE (XXXXX.XX)**. If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places.

Paragraph for Question Nos. 31 and 32

A reversible cyclic process involves 6 steps. In step-1 and 3, the system absorbs 500 J and 800 J of heat from a heat reservoir at temperature 250 K (T_1) and 200 K (T_3) respectively.
 Step-2, 4 and 6 are adiabatic such that the temperature of one reservoir changes to that of next.
 Total work done by the system in whole process is 700 J.

31. If total entropy change during steps-1, 3 and 5 be 'x' J/K, then the value of $\left(\frac{x+4}{5}\right)$ is
32. If during step-5, the system exchanges heat from a reservoir at temperature ' T_5 K', then value of $\frac{T_1}{T_5}$ is:

Paragraph for Question Nos. 33 and 34

1 mole of a hydrocarbon (X) on reductive ozonolysis consumes one mole of O_3 and produces two organic compounds (Y) and (Z). Compound (Z) on reaction with two moles of methanal in presence of NaOH produces 2,2-dimethylpropan-1,3 diol and another product (A).
 (A) on acidification gives a compound which gives positive silver mirror test.
 (Y) gives yellow precipitate with I_2 and alkali. (Y) on oxidation with SeO_2 gives (B) which on heating with conc. alkali followed by acidification, gives Mandelic acid as the only organic product.

Major product formed by the reaction of (Y) with ethyl acetate in presence of sodium ethoxide and ethanol on heating with acrolein (1 mole) in presence of excess alkali produces compound (C) as the major organic product.

While answering the following questions, follow the assumptions:

- (i) Benzene ring (if any) does not undergo ozonolysis.
 - (ii) Consider all products (X, Y, Z, A, B and C) as the major organic products.
 - (iii) As per IUPAC system, Mandelic acid is named as '2-phenyl, 2-hydroxy ethanoic acid' and acrolein is named as prop-2-enal.
- [Atomic masses: C = 12, O = 16, N = 14, H = 1, Na = 23, K = 39]

33. The ratio of the molar mass of 'X' to the total number of ozonides that 'X' can form, is.....
34. In the compounds, X, Y, Z, A, B and C.
If the sum of the number of pi-bonds in all of the above product = m and if degree of unsaturation of (C) be n, then find the value of $\frac{2m}{n}$.

Mathematics

PART – III

SECTION – A

(One Options Correct Type)

This section contains **FOUR (04)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.

35. Let ΔPQR be equilateral with side length a . On side PQ produced a point A is taken such that P lies in between A and Q . If r_1 is in radius of ΔAPR and r_2 be ex-radius of ΔAQR with respect to side QR , then $\frac{r_1 + r_2}{a}$ is equal to
- (A) $\frac{\sqrt{3}}{2}$ (B) $\sqrt{2}$
(C) 2 (D) $\frac{1}{\sqrt{2}}$
36. A person has 6 cards A, K, 2, Q, 10, 9. The person randomly draws the cards one by one with replacement till he gets 3 consecutive A. If P_n represents the probability that atleast n cards are drawn, then $216P_n - 5P_{n-3} - 30P_{n-2} - 180P_{n-1}$ is (For $n > 3$)
- (A) 0 (B) 1
(C) 2 (D) 3
37. Let A and B be 3×3 matrices and $P = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$, $B = PAP$, then $\lim_{n \rightarrow \infty} \frac{\text{tr}(A^n + PB^n P)}{\text{tr}(A^n)}$ is equal to
- (where $|A^n| \neq 0$, tr represents trace of square matrix)
- (A) 1 (B) 2
(C) 3 (D) 4
38. Let $f(x) = \frac{1}{\sin^2 x - (x-a)^2}$, $x \in [0, 1]$ and $a \in [2, 3]$, then which of the following is correct?
- (A) $f(x)$ always increases in $(0, 1)$
(B) $f(x)$ always decreases in interval $(0, 1)$
(C) there exists a point of local minima in $(0, 1)$
(D) there exists a point of local maxima in $(0, 1)$

SECTION – A

(One or More than one correct type)

This section contains **THREE (03)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct answer(s).

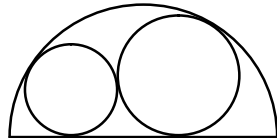
39. Let the value of $\log_2 \left(\prod_{a=1}^{2015} \prod_{b=1}^{2015} \left(1 + e^{\frac{2\pi i ab}{2015}} \right) \right)$ is N , then which of the following is/are TRUE?
- (A) N is divisible by 5 (B) N is divisible by 3
(C) $N > 13000$ (D) N is divisible by 61

40. Let $f : [1, \infty) \rightarrow \mathbb{R}$ is a differentiable function such that $f'(x) = \frac{1}{x^2 + f^2(x)}$ and $f(1) = 1$, then which of the following is/are correct?
 (A) $f(x)$ is strictly increasing in $(1, \infty)$
 (B) $\lim_{x \rightarrow \infty} f(x) < 2$
 (C) The number of solution of $f(x) = 1 + 2x$ is 0
 (D) $f(3) < 2$
41. If all roots of the equation $x^8 - 4x^7 + b_6x^6 + b_5x^5 + b_4x^4 + b_3x^3 + b_2x^2 + b_1x + \frac{1}{2^8} = 0$ are positive and real, then which of the following is/are correct?
 (A) $\frac{b_2b_6}{b_4} = 0.7$
 (B) $\frac{b_2b_6}{b_4} = 0.5$
 (C) $\frac{b_3b_5}{b_4} = \frac{14}{5}$
 (D) $\frac{b_2}{b_1} = -7$

SECTION – B

(Numerical Answer Type)

This section contains **SIX (06)** Numerical based questions. The answer to each question is a **NON-NEGATIVE INTEGER VALUE**.

42. The area bounded by region $\{(x, y) : |x + ay + a^2| \leq 1 \ \forall \ a \in [0, 1]\}$ is A , then $[A]$ is (where $[.]$ denotes greatest integer function)
43. Two circles with radius r_1 and r_2 touches each other externally and touch a semicircle of radius 1 internally as shown in figure. If maximum value of $r_1 + r_2$ is k , then $\frac{3k}{\sqrt{2}-1}$ is
- 
44. Let $P(x)$ and $Q(x)$ be polynomials with real coefficients such that $P(x)(x^2 - 3x + 2) = Q(x)(x^2 + 3x + 2)$. Then minimum number of real roots of the equation $P(x) \cdot Q(x) + x^4 - 5x^2 + 4 = 0$ is
45. $\lim_{n \rightarrow \infty} \sin\left(\frac{1}{n^2}\right) + \sin\left(\frac{2}{n^2}\right) + \dots + \sin\left(\frac{n}{n^2}\right)$ is t , then $2t$ is equal to
46. If A is a 2×2 matrix such that $\text{trace}(A) = \det(A) = 3$, then $\text{trace}(A^{-1})$ is
47. To each positive integer with n^2 decimal digits we associate the determinant of the matrix obtained by writing the digits in order across the rows. For example, for $n = 2$, to the integer 8617 we associate $\det \begin{pmatrix} 8 & 6 \\ 1 & 7 \end{pmatrix} = 50$. If the sum of all the determinants associated with n^2 -digit integers be S , then $\frac{S}{451 \times 45}$ is equal to
 (Leading digits are assumed to be nonzero; for example, for $n = 2$, there are 9000 determinants)

SECTION – C
(Numerical Answer Type)

*This section contains **TWO (02) paragraphs**. Based on each paragraph, there are **TWO (02)** questions of numerical answer type. The answer to each question is a **NUMERICAL VALUE (XXXXX.XX)**. If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places.*

Paragraph for Question Nos. 48 and 49

Let $P(-1, \alpha)$, $Q(2, \beta)$ be foci of the ellipse which touches $y = x$ at $(1, 1)$. If length of major axis of ellipse is $\frac{3}{2}\sqrt{17}$, then

48. The value of $\alpha(> 0)$ is
49. The value of ordinate of centre of ellipse if $(\alpha > 0)$ is

Paragraph for Question Nos. 50 and 51

Let $P(1, s, t)$ be a point and $L_1 : x + y = 1, z + 2y = 2$, $L_2 : x + y = 1, z - 3y = 2$ be straight lines, then

50. If there exist infinite number of lines passing through P and intersecting both the lines, then the value of s is
51. If there exist unique line passing through P and intersecting both the lines L_1 and L_2 , then number of values of s such that P lies on the plane $x + y = 1$ is