

FIITJEE

ALL INDIA TEST SERIES

FULL TEST – II

JEE (Advanced)-2019

PAPER – 2

Time Allotted: 3 Hours

Maximum Marks: 231

General Instructions:

- The test consists of total 69 questions.
- Each subject (PCM) has 23 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-C & Section-D**.

***Section-A (01 – 03, 24 – 26, 47 – 49)** contains 9 multiple choice questions which have **only one correct answer**. Each question carries **+3 marks** for correct answer and **–1 mark** for wrong answer.*

***Section-A (04 – 08, 27 – 31, 50 – 54)** contains 15 multiple choice questions which have **one or more than one correct answer**. Each question carries **+4 marks** for correct answer and **–2 mark** for wrong answer.*

Partial Marks +1 for each correct option provided no incorrect options is selected.

***Section-A (09 – 10, 32 – 33, 55 – 56)** contains 3 paragraphs. Based upon paragraph, 2 multiple choice questions have to be answered. Each question has **only one correct answer** and carries **+3 marks** for correct answer. There is no negative marking.*

***Section-C (11 – 20, 34 – 43, 57 – 66)** contains 30 Numerical based questions with answer as numerical value from **0 to 9** and each question carries **+3 marks** for correct answer. There is no negative marking.*

***Section-D (21 – 23, 44 – 46, 67 – 69)** contains 9 Numerical answer type questions with answer XXXXX.XX and each question carries **+4 marks** for correct answer and **–1 mark** for wrong answer.*

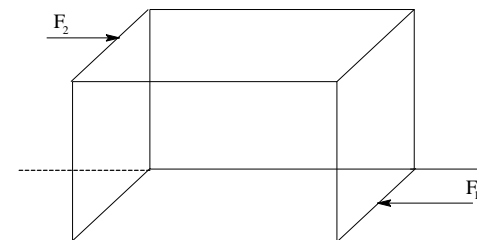
Physics

PART – I

SECTION – A
(Single Correct Choice Type)

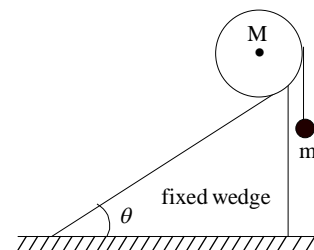
This section contains **3 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**.

1. A cubical container has 2 fixed vertical walls and two vertical walls can freely rotate about one of the horizontal edges. The right wall can rotated about upper edge the bottom wall about the bottom edge. Water is filled upto the top and forces F_1 and F_2 (perpendicular to the walls) are applied to keep the walls at from opening as shown in figure. Given that the cube is at rest on a rough horizontal surface. (Ignore atmospheric pressure)
- (A) Friction from the surfaces is to the left
 - (B) Friction from the surfaces is to the right
 - (C) Normal reaction is shifted towards left wall
 - (D) Normal reaction is passes through the center



2. A uniform cylinder of mass M lies on a fixed plane inclined at an angle θ with the horizontal. A light string is tied to the cylinder at the right most point, and a mass m hangs from the string, as shown. Assume that the coefficient of friction between cylinder and the surface to be large enough to prevent slipping. For cylinder to remains static, the value of m is:

- (A) $\frac{M \cos \theta}{1 + \sin \theta}$
- (B) $\frac{M \sin \theta}{1 - \sin \theta}$
- (C) $\frac{M \cos \theta}{1 - \sin \theta}$
- (D) $\frac{M \sin \theta}{1 + \sin \theta}$



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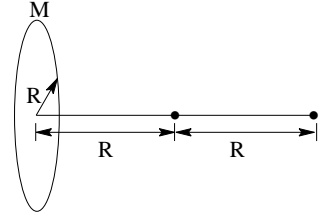
3. A ring having non-uniform distribution of mass M and radius R is being considered. A point mass m_0 is taken slowly away from the ring from A to B. In doing so, work done by the external force is:

(A) $\frac{GMm_0}{\sqrt{2}}$

(B) $\frac{G}{\sqrt{2} + \sqrt{5}} \frac{Mm_0}{\sqrt{2}}$

(C) $GMm_0 \left[\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{5}} \right]$

- (D) It cannot be determined, because the nature of distribution of mass is not known.



(One or More than one correct type)

This section contains **5 questions**. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four options is(are) correct.

4. A string of wood of mass M and length l is placed on a smooth horizontal surface. An insect of mass m starts at one end of the strip and walks to the other end in time t , moving with a constant speed:

(A) The speed of the insect as seen from the ground is $< l/t$

(B) The speed of the strip as seen from the ground is $l/t(M/M+m)$

(C) The speed of the strip as seen from the ground is $l/t(m/M+m)$

(D) The total kinetic energy of the system is $1/2 (m+M)(l/t)^2$

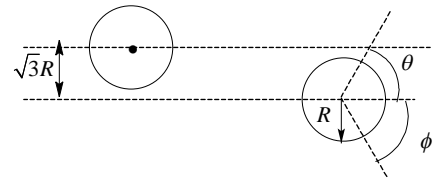
5. A disk moving on a frictionless horizontal table collides elastically with another identical disk as shown. The directions of motion of the two disks make angle θ and ϕ with the initial line of motion as shown. Then:

(A) $\theta = 30^\circ$

(B) $\theta = 60^\circ$

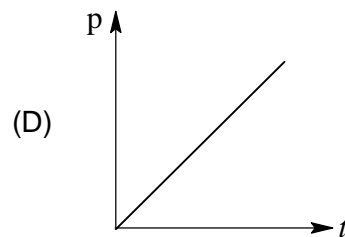
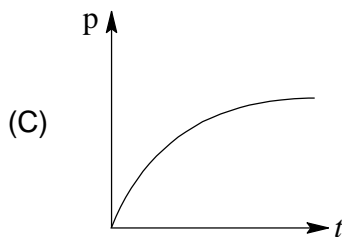
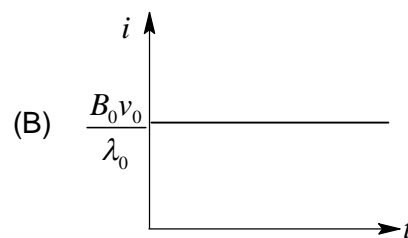
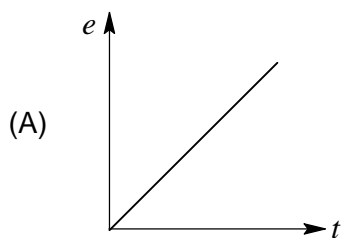
(C) $\phi = 30^\circ$

(D) $\phi = 60^\circ$



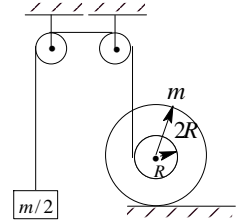
Space for Rough work

6. A particle moves in a circle of radius 20 cm. Its linear speed is given by $v = 2t$ where t is in seconds and v in ms^{-1} . Then:
- (A) The radial acceleration at $t = 2\text{s}$ is 80 ms^{-2}
 - (B) Tangential acceleration at $t = 2\text{s}$ is 2 ms^{-2}
 - (C) Net acceleration at $t = 2\text{s}$ is greater than 80 ms^{-2}
 - (D) Tangential acceleration remains constant in magnitude
7. A long straight slider is moved with constant velocity $\vec{v} = v_0 \hat{i}$ parallel to earth surface in the x - y plane in a uniform magnetic field $\vec{B} = B_0 \hat{k}$ on a resistanceless rails in the form of curve $y^2 = 4x$. Here emf induced in the loop, current, power, resistance of slider per unit length and time are represented by e, i, p, λ_0 and t respectively. If at $t = 0$ slider starts from $x = 0$. Then which of the following option(s) is/are correct.



Space for Rough work

8. System shown in the figure is released from rest and spool does not slip at any point of its motion. Thread and pulley are ideal thread is of sufficient in length. Which of following are correct statements after of spool and block are released:



- (A) Spool will keep moving toward right
 (B) Spool will leave contact with table after covering certain distance
 (C) Block will be at rest when spool will have maximum velocity.
 (D) Block and spool will both execute oscillatory motion and their ratio of time period will be 2 : 1

Paragraph type (One Option Correct)

This section contains **1 paragraph** each describing theory, experiment, data etc. **Two questions** relate to the paragraph. Each question of a paragraph has **Only One correct answer** among the four choices (A), (B), (C) and (D).

Paragraph for Questions 9 & 10

An ideal diatomic gas is expanded so that the amount of heat transferred to the gas is equal to the decrease in its internal energy.

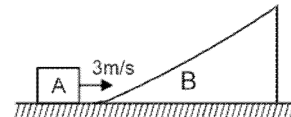
9. The molar specific heat of the gas in this process is given by C whose value is:
- (A) $-\frac{5R}{2}$ (B) $-\frac{3R}{2}$
 (C) $2R$ (D) $\frac{5R}{2}$
10. The process can be represented by the equation $TV^n = \text{constant}$, where the value of n is:
- (A) $n = \frac{7}{5}$ (B) $n = \frac{1}{5}$
 (C) $n = \frac{3}{2}$ (D) $n = \frac{3}{5}$

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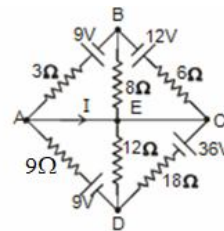
SECTION – C
(Single digit integer type)

This section contains **10 questions**. The answer to each question is a **Single Digit Integer** ranging from 0 to 9, both inclusive.

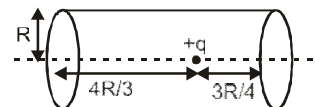
11. In the figure shown A is of mass 1 kg and B of mass 2 kg. A moves with velocity 3 m/s and rises on B which is initially at rest. All the surfaces are smooth. By the time A reaches the highest point on B, find the work done by A on B in joule



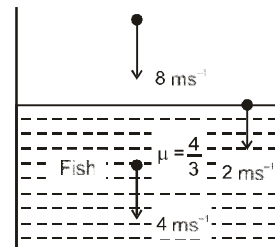
12. In the show circuit all cells are ideal. If current in branch BE is x ampere and current in branch AE is y ampere then value of x + y (in ampere) is



13. A point charge +q is placed on the axis of a closed cylinder of radius R and height $25R/12$ as shown. If electric flux coming out from the curved surface of cylinder is $\frac{xq}{10\epsilon_0}$, then calculate x.

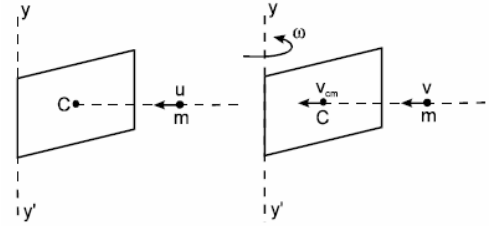


14. Speed of bird with respect to fish in ms^{-1} at given instant, if water surface is moving downward 2 m/sec at this time:

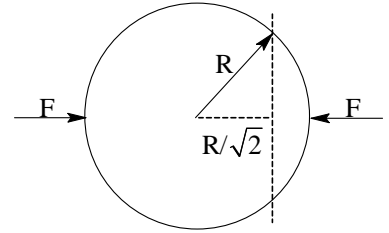


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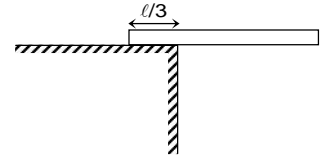
15. A uniform square plate of mass $m = 100 \text{ gm}$ and side $a = 24 \text{ cm}$ can rotate about a smooth vertical axis passing through one edge. It is initially at rest. A particle of mass $m = 100 \text{ gm}$ is moving horizontally and perpendicular to the plane of the plate with velocity $u = 70 \text{ cm/s}$. It collides with the plate elastically at the centre of the plate. Find the angular velocity (in rad/s) of the plate just after collision?



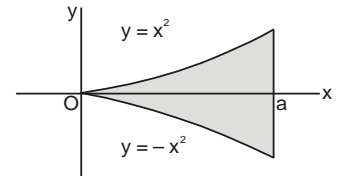
16. A thin spherical shell of radius 'R' carries a uniform surface charge density σ . It is cut into two parts by a plane at a distance $R/\sqrt{2}$ from the centre as shown. To hold two parts together force F from both sides has to be applied. The minimum force F is $\frac{\pi\sigma^2 R^2}{n\epsilon_0} k$, then the value of 'n' is,



17. A uniform rod is placed at the table such that $1/3^{\text{rd}}$ of the part is on the table initially. Rod is initially at rest. If normal reaction at that instant is $N = k \frac{mg}{4}$, then $k = ?$



18. The moment of inertia about x-axis of uniform thin plate of density $\rho \text{ kg/m}^2$ as shown in the figure is $\frac{N\rho a^7}{21}$, then find the value of N?



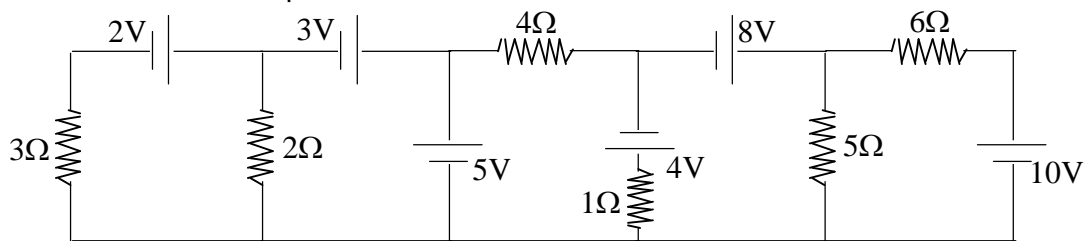
19. Expression for the magnetic dipole moment induction at the centre of a Bohr's hypothetical hydrogen atom in the nth orbit of the electron in terms of universal constants is $M = \frac{neh}{k\pi m}$, then the value of k...
20. A solid sphere of radius R is half immersed in a liquid of density ρ . The frequency of oscillation of the sphere for small displacement is $f = \frac{1}{2\pi} \sqrt{\frac{Ng}{2R}}$. Find N.

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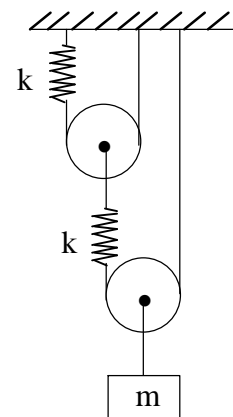
SECTION – D
(Numerical Answer Type)

This section contains **3 questions**. The answer to each question is a **NUMERICAL VALUE**. For each question, enter the correct numerical value (in decimal notation, truncated/rounded-off to the **second decimal place**; e.g. xxxxx.xx).

21. For the circuit shown in the figure, find the current passing through the resistor of resistance 1Ω in ampere.



22. A block of mass m hangs in equilibrium with the help of two springs as shown in the figure. Find the time period of vertical oscillation of the block, take $m = 1\text{kg}$ and $k = \pi^2\text{N/m}$.



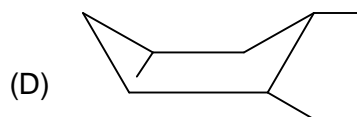
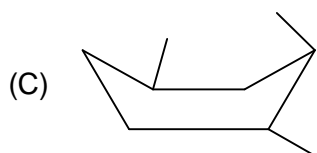
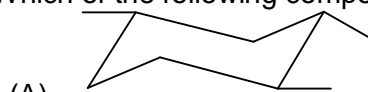
23. In an experiment for calculation of focal length of a convex lens the distance between a screen and an object is 120 cm. A convex lens is placed closed to the object and is moved along the line joining object and screen, towards the screen. Two sharp images of the object are found on the screen. If the ratio of magnification of two real images is 1:16 then find the focal length of the convex lens.

Space for Rough work

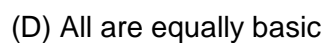
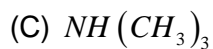
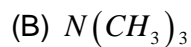
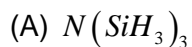
Chemistry**PART – II****SECTION – A**
(Single Correct Choice Type)

This section contains **3 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**.

24. Which of the following compound has lowest potential energy?



25. Which of the following is weaker base?



26. Suppose that metal carbonyls follow the EAN rule, find the value of x in the $Fe(CO)_x$:

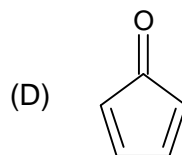
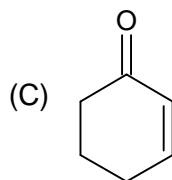
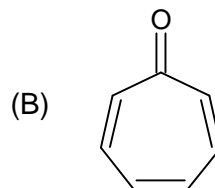
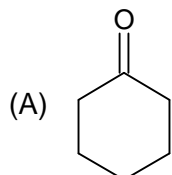
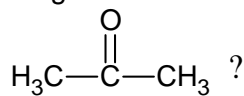


Space for Rough work

(One or More than one correct type)

This section contains **5 questions**. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four options is(are) correct.

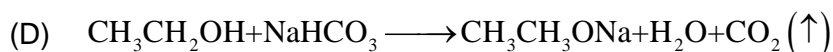
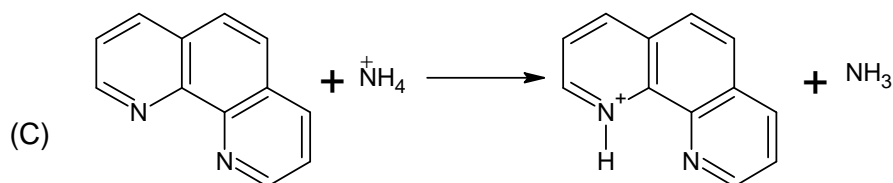
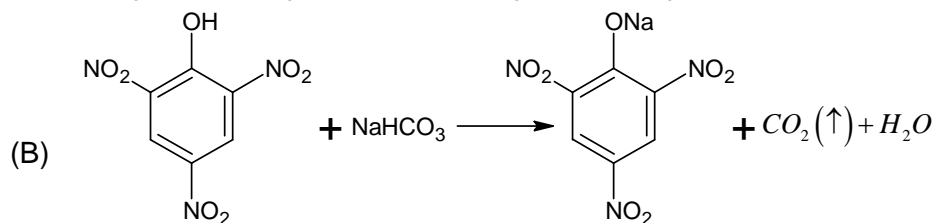
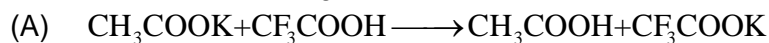
27. Which of the following compound have larger $C-O$ bond length than $C-O$ bond length of



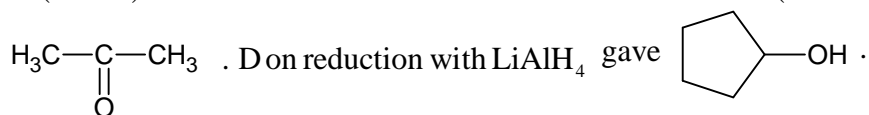
28. The correct statement/statements is/are:
- (A) The distance between two octahedral voids of a cubic close packing of atoms with radius r is $2r$
- (B) The distance between two tetrahedral voids of a cubic close packing of atoms with radius r is $\sqrt{6} \times r$ at the body diagonal axes
- (C) The distance between tetrahedral and octahedral void is $\sqrt{\frac{3}{2}} \times r$, where r is the radius of atom forming the close packing
- (D) The distance between the surfaces of atoms fcc arrangement along an edge is $2(\sqrt{2}-1)r$

Space for Rough work

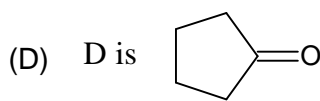
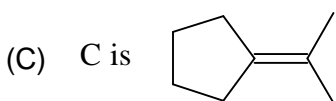
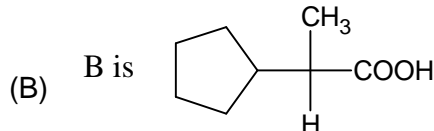
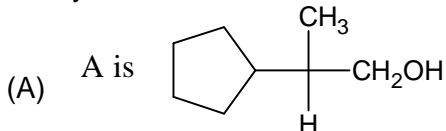
29. Which one of the following reactions is/are correct?



30. An optically active alcohol A ($\text{C}_8\text{H}_{16}\text{O}$) on oxidation gives B. A on acidic heating gives C (C_8H_{14}) as major product. C on ozonolysis produces D ($\text{C}_5\text{H}_8\text{O}$) and

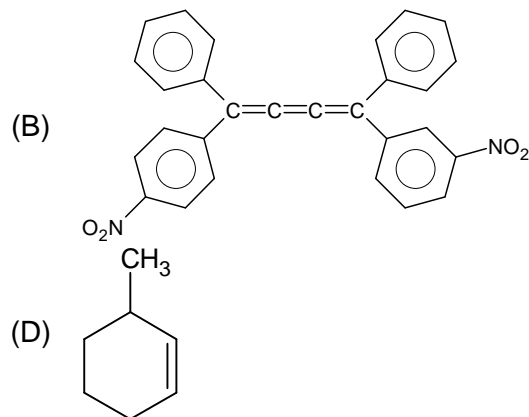
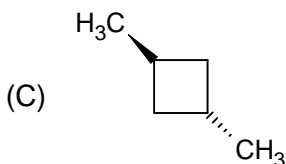
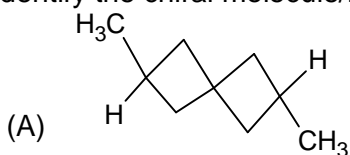


Identify correct answer:



Space for Rough work

31. Identify the chiral molecule/molecules:

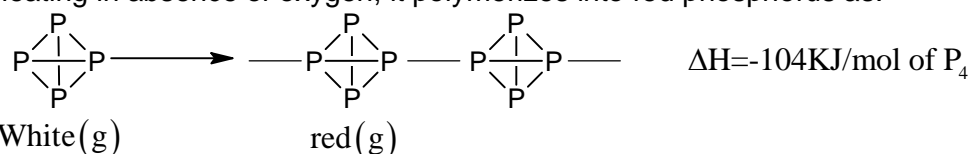


Paragraph type (One Option Correct)

This section contains **1 paragraph** each describing theory, experiment, data etc. **Two questions** relate to the paragraph. Each question of a paragraph has **Only One correct answer** among the four choices (A), (B), (C) and (D).

Paragraph for Questions 32 & 33

White phosphorus is a tetra atomic solid $[P_4(s)]$ at room temperature and on strong heating in absence of oxygen, it polymerizes into red phosphorus as:



The enthalpy of sublimation $[P_4(s) \longrightarrow P_4(g)]$ white is 59 KJ/mol and enthalpy of atomization is 316.25 KJ/mol of P(g).

Now give the answers of following questions:

32. The average P – P bond enthalpy in P_4 molecule is:

- (A) 102 KJ (B) 201 KJ
 (C) 104 KJ (D) 120 KJ

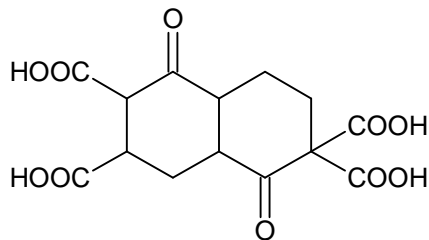
Space for Rough work

33. The P–P bond enthalpy in red phosphorus joining the two tetrahedral is:
 (A) 201 KJ (B) 104 KJ
 (C) 305 KJ (D) 80 KJ

SECTION – C
(Single digit integer type)

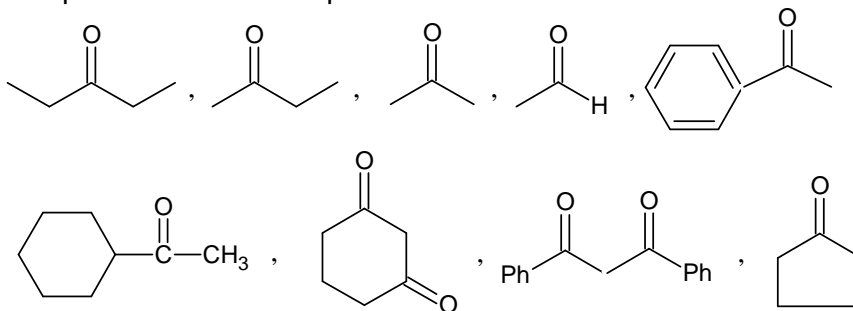
This section contains **10 questions**. The answer to each question is a **Single Digit Integer** ranging from 0 to 9, both inclusive.

34. If four atoms of same radius are placed at the alternate corner of a cube touching each other, than the length of body diagonal of the cube is equal to $\sqrt{x} \times R$, where R is the radius of atom. Find the value of x ?
35. What will be the pH of the resulting solution obtained by mixing 20 mL of 0.1 N HCl and 20 mL of 0.1 N KOH solution?
36. Diethyl- β , β -dimethylglutaric acid (ester) is condensed with diethyl oxalate in presence of sodium ethoxide and ethanol to form a major product (P), which on acidic hydrolysis followed by heating gives another product (Q). Calculate total number of C=O bonds in (P) and (Q) compounds?
37. How many moles of CO_2 will released when following compound is heated



Space for Rough work

38. Examine the structural formulas of compounds given below and identify number of compounds which show positive iodoform test.



39. The cost of electricity required to deposit 1 g Mg is Rs. 5.00. The cost of 30 g of Al to be deposited is Rs. X. Find the value of $\frac{x}{40}$?
40. Co forms dinuclear complex with a sigma bond within two Co atoms. Consider that metal carbonyls follows EAN rule. The complex can be written as $Co_2(CO)_x$. Find the value of x ?
41. In a cube of arrangement of atoms, atoms of an element are present at the corners, face centres, edge centres & the body centre of the cube. The number of atoms per unit cell, which is formed in this arrangement, is equal to.
42. Polythene can be prepared from calcium carbide by following reactions
 $CaC_2 + 2H_2O \longrightarrow Ca(OH)_2 + C_2H_2$
 $C_2H_2 + H_2 \longrightarrow C_2H_4$
 $nC_2H_4 \longrightarrow \text{polythene}$
 Calculate the amount of polythene formed from 16 kg CaC_2 in kg.....
43. Consider the following reaction $M^{x+} + Cr_2O_7^{2-} \longrightarrow MO_3^- + Cr^{3+}$. If one mole of $Cr_2O_7^{2-}$ oxides 3 mole of M^{3+} to MO_3^- . Find the value of x

Space for Rough work

SECTION – D
(Numerical Answer Type)

This section contains **3 questions**. The answer to each question is a **NUMERICAL VALUE**. For each question, enter the correct numerical value (in decimal notation, truncated/rounded-off to the **second decimal place**; e.g. xxxxx.xx).

44. Calculate the amount of $K_2Cr_2O_7$ required to produce 4.4 L CO_2 at STP when treated with excess of oxalic acid. (Molar mass of $K_2Cr_2O_7$ is 294)
45. A mixture of ethane and ethene occupies 40 L at 1 atm and at 400K. The mixture reacts completely with 128g of O_2 to produce CO_2 and H_2O . Assuming ideal behaviour, calculate the mole fraction of C_2H_4 in the mixture (gas constant $R = 0.08 \text{ atm mol}^{-1}$, molar wt of $O_2 = 32$)
46. There are 2×10^{24} unit cells in 1 kg of metal for which the density is 4 g/cc. Calculate the side length of the cubic simple unit cell of the lattice of metal in \AA .
-

Space for Rough work

Mathematics

PART – III

SECTION – A
Single Correct Choice Type

This section contains **3 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**.

47. Solution of differential equation $f'(x)f''(x) = 3(f''(x))^2, (y = f(x))$ is:
 (A) $x = k_1y^2 + k_2y + k_3$ (B) $y = k_1x^2 + k_2 + k_3$
 (C) $x = \sin y$ (D) None of these
48. Let $f(x)$ is an even function such that $f(x) + f(x-3) = x(x-3) + 1$, then $\int_0^3 \frac{f(x)dx}{(x^2-3x+1)}$ is
 (A) $-\frac{2}{3}$ (B) $-\frac{3}{2}$
 (C) $\frac{2}{3}$ (D) $\frac{3}{2}$
49. Let S_n denotes the sum of first n term of an arithmetic progression whose first term is -4 and common difference is 1 . If $V_n = 2S_{n+2} - 2S_{n+1} + S_n, (n \in \mathbb{N})$, then
 (A) $V_n = \frac{-9n^2 + 5n - 12}{2}, (n \in \mathbb{N})$ (B) $V_n = \frac{n^2 + 5n + 12}{2}, (n \in \mathbb{N})$
 (C) Minimum value of V_n is -9 (D) Minimum value of V_n is $-\frac{73}{8}$

Space for Rough work

(One or More than one correct type)

This section contains **5 questions**. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four options is(are) correct.

50. If in a ΔABC , a, b, c are in A.P. and P_1, P_2, P_3 are the altitudes from the vertices A, B and C respectively, then
 (A) P_1, P_2, P_3 are in A.P. (B) P_1, P_2, P_3 are in H.P.
 (C) $P_1 + P_2 + P_3 \leq \frac{3R}{\Delta}$ (D) $\frac{1}{P_1} + \frac{1}{P_2} + \frac{1}{P_3} \leq \frac{3R}{\Delta}$
51. Given three non – zero, non – coplanar vectors, and \vec{a}, \vec{b} and \vec{c} and $\vec{r}_1 = p\vec{a} + q\vec{b} + \vec{c}$ and $\vec{r}_2 = \vec{a} + p\vec{b} + q\vec{c}$ if the vectors $\vec{r}_1 + 2\vec{r}_2$ and $2\vec{r}_1 + \vec{r}_2$ are collinear then (p, q) is
 (A) $(0, 0)$ (B) $(1, -1)$
 (C) $(-1, 1)$ (D*) $(1, 1)$
52. Each of 2010 boxes in a line contains one red marble and for $1 \leq k \leq 2010$, the box is the k^{th} position also contain k white marbles. A child begins at the first box and successively drawn a single marble at random from each box in order. The stops when he first draws a red marble. Let $p(n)$ be the probability that he stops after drawing exactly n marbles.
 The possible value(s) of n for which $p(n) < \frac{1}{2010}$ is:
 (A) 44 (B) 45
 (C) 46 (D) 47
53. If α, β, γ are roots of $x^3 + 2x^2 - 3x + 1 = 0$, then value of $\frac{\alpha\beta}{\alpha + \beta} + \frac{\alpha\gamma}{\alpha + \gamma} + \frac{\beta\gamma}{\beta + \gamma}$ is less than
 (A) 2 (B) 3
 (C) 4 (D) 5
54. The solution of differential equation $3\frac{dx}{dy} = \frac{x}{x^3 - y}$ is $x^\ell = mx^n y + c$, then which of the following is/are **CORRECT**? {c is any arbitrary constant}
 (A) $\ell + m + n = 11$ (B) $\ell + n = 9$
 (C) $\ell + 2m = 10$ (D) $m + n = 4$

Space for Rough work

Paragraph type (One Option Correct)

This section contains **1 paragraph** each describing theory, experiment, data etc. **Two questions** relate to the paragraph. Each question of a paragraph has **Only One correct** answer among the four choices (A), (B), (C) and (D).

Paragraph for Questions 55 & 56

Let t be a real number satisfying $2t^3 - 9t^2 + 30 - \lambda = 0$ where $t = x + \frac{1}{x}$ and $\lambda \in \mathbb{R}$ then

55. If the cubic equation has three real and distinct solution for x then λ
 (A) Is greater than 9 (B) Is greater than 11
 (C) Is less than 8 (D) Is not equal to 10
56. If the cubic equation has exactly two real and distinct roots of x then exhaustive set of values of λ is
 (A) $\lambda \in (-\infty, 3) \cup (30, \infty)$ (B) $\lambda \in (-\infty, -22) \cup (10, \infty) \cup \{3\}$
 (C) $\lambda \in \{3, 30\}$ (D) None of these

SECTION – C
(Single digit integer type)

This section contains **10 questions**. The answer to each question is a **Single Digit Integer** ranging from 0 to 9, both inclusive.

57. $f(x) = \max|2 \sin y - x|$ where $y \in \mathbb{R}$ then minimum value of $f(x)$ is:
58. Let $f(x) (x > 1)$ be a differentiable function satisfying $f(x) = (\ln x)^2 - \int_1^e \frac{f(t)}{t} dt$. Then if Area bounded by tangent line of $y = f(x)$ at $(e, f(e))$, then curve $y = f(x)$ and $x = 1$ is A then $[A]$ is $([.]$ is G. I. F)

Space for Rough work

59. If the equation on reflection of $\frac{(x-4)^2}{16} + \frac{(y-3)^2}{9} = 1$ about the line $x - y - 2 = 0$ is $16x^2 + 9y^2 + k_1x - 36y + k_2 = 0$ then $\frac{k_1 + k_2}{22}$ is
60. A and B are two square matrices such that $A^2B = BA$ and if $(AB)^{10} = A^k B^{10}$ then the value of $k - 1020$ is....
61. If two points P and Q on $9x^2 - 5y^2 = 1$ (whose centre is C) be such that CP is perpendicular to CQ then value of $\frac{1}{CP^2} + \frac{1}{CQ^2}$ is.....
62. Let z_1, z_2 and z_3 be complex numbers such that $|z_1| = |z_2| = |z_3| = |z_1 + z_2 + z_3| = 2$. If $|z_1 - z_2| = |z_1 - z_3|$ and $z_2 \neq z_3$. Then find the value of $|z_1 + z_2| |z_1 + z_3|$.
63. If $\lim_{x \rightarrow 1} \frac{100}{1-x^{100}} - \frac{50}{1-x^{50}} = 5A$; find the value of A.
64. Let $H_n = 1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$ and $T_n = \frac{1}{(n+1)H_n H_{n+1}}$, then the value of $(T_1 + T_2 + T_3 + \dots + \infty)$ is:
65. There are 4 bowlers, 4 batsman and 1 all-rounder (who is bowler as well as batsman). Randomly a team of 4 players consisting of at least two bowlers and at least two batsman is formed. If the probability that all-rounder has been selected in team is $\frac{4}{p}$, then p is equal to:
66. Suppose $\int \frac{1-7\cos^2 x}{\sin^7 x \cos^2 x} dx = \frac{g(x)}{\sin^7 x} + C$, where C is an arbitrary constant of integration. Then the value of $g'(0) + g''\left(\frac{\pi}{4}\right)$.

Space for Rough work

SECTION – D
(Numerical Answer Type)

This section contains **3 questions**. The answer to each question is a **NUMERICAL VALUE**. For each question, enter the correct numerical value (in decimal notation, truncated/rounded-off to the **second decimal place**; e.g. xxxxx.xx).

67. Mr. A lists all the positive divisors of the number $N(2010)^2$ and selects two divisors from the list then the probability that exactly one of the selected divisors is perfect squares is:

68. If $\frac{(x-3)^{\frac{-|x|}{x}} \sqrt{(x-4)^2} (17-x)}{\sqrt{-x}(-x^2+x-1)(|x|-32)} < 0$ then no. of integers x satisfying the inequality is:

69. Let f be real function defined on R (the set of real numbers) such that $f'(x) = 100(x-1)(x-2)^2(x-3)^3 \dots (x-100)^{100}$, for all $x \in R$. If g is a function defined on R such that $\int_a^x e^{f(t)} dt = \int_0^x g(x-t) dt + 2x + 3$, If some of the all the values of x for which $g(x)$ has a local extremum be λ then find $\frac{\lambda}{3}$

Space for Rough work