



# Sri Chaitanya IIT Academy.,India.

A.P. T.S. KARNATAKA TAMILNADU MAHARASTRA DELHI RANCHI

A right Choice for the Real Aspirant

ICON Central Office - Madhapur - Hyderabad

SEC: Sr.Super60\_STERLING BT

JEE-MAIN

Date: 13-09-2025

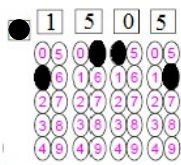
Time: 09:00AM to 12:00PM

RPTM-06

Max. Marks: 300

## IMPORTANT INSTRUCTION:

- Immediately fill in the Admission number on this page of the Test Booklet with **Blue/Black Ball Point Pen** only.
- The candidates should not write their Admission Number anywhere (except in the specified space) on the Test Booklet/ Answer Sheet.
- The test is of **3 hours** duration.%
- The Test Booklet consists of **75 Questions**. The maximum marks are **300**.
- There are **three** parts in the question paper 1,2,3 consisting of **Mathematics, Physics and Chemistry** having **25 Questions** in each subject and subject having **two sections**.  
(I) Section –I contains **20 Multiple Choice Questions** with only one correct option.  
**Marking scheme:** +4 for correct answer, 0 if not attempt and -1 in all other cases.  
(II) Section-II contains **05 Numerical Value Type Questions**.  
■ The Answer should be within **0 to 9999**. If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i.e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11**).  
To cancel any attempted question bubble on the question number box.  
For example: To cancel attempted Question 21. Bubble on 21 as shown below



## Question Answered for Marking Question Cancelled for Marking

**Marking scheme:** +4 for correct answer, 0 if **not attempt** and -1 in all other cases.

- Use **Blue / Black Point Pen** only for writing particulars / marking responses on the Answer Sheet. **Use of pencil is strictly prohibited.**
- No candidate is allowed to carry any textual material, printed or written, bits of papers, mobile phone any electron device etc, except the Identity Card inside the examination hall.
- Rough work is to be done on the space provided for this purpose in the Test Booklet only.
- On completion of the test, the candidate must hand over the Answer Sheet to the invigilator on duty in the Hall. **However, the candidate are allowed to take away this Test Booklet with them.**
- Do not fold of make any stray marks on the Answer Sheet**

Name of the Candidate (in Capital): \_\_\_\_\_

Admission Number:

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Candidate's Signature: \_\_\_\_\_

Invigilator's Signature: \_\_\_\_\_

**13-09-25\_Sr.Super60\_STERLING BT\_Jee-Main\_RPTM-06\_Test Syllabus****MATHEMATICS** : Areas and Differential Equations**PHYSICS** : Gauss law: Flux of electric field, Gauss's law and its application in simple cases, such as, to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell. Dielectrics and electric polarization, Properties of Conductors,Capacitors: Capacitance, Parallel plate capacitor with and without dielectrics, Capacitors in series and parallel, Energy stored in a capacitor.(Exclude RC Circuits)  
(In Phy & Che Each Out of 25Qs, 10 Qs From NCERT is Mandatory)**CHEMISTRY** : Amines: Basicity of substituted anilines and aliphatic amines, Preparation from nitro compounds, nitriles and amides, Reactions: Hoffmann bromamide degradation, Gabriel phthalimide synthesis, Reaction with nitrous acid, Azo coupling reaction of diazonium salts of aromatic amines, Sandmeyer and related reactions of diazonium salts, Carbylamine reaction, Hinsberg test, Alkylation and acylation reaction

Carboxylic acids &amp; derivatives: Physical properties, Preparation: from nitriles, Grignard reagents, hydrolysis of esters and amides, Formation of esters, acid chlorides, and amides, Preparation of benzoic acid from alkylbenzenes, Reactions: reduction, halogenation, formation of esters, acid chlorides, anhydrides and amides

Polymers: Types of polymerization (addition, condensation), Homo and copolymers, Natural rubber, Cellulose, Nylon, Teflon, Bakelite, PVC, polythene, synthetic rubber, Bio-degradable polymers, Applications of polymers.

**NOTE: POLYMERS (NOT IN JEE MAINS)**

(In Phy &amp; Che Each Out of 25Qs, 10 Qs From NCERT is Mandatory)

**THE PERFECT HAT-TRICK WITH ALL-INDIA RANK 1**  
**IN JEE MAIN 2023 JEE ADVANCED 2023 AND NEET 2023****JEE MAIN**  
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MARKS**RANK****1****NEET**  
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MARKS**RANK****1**

**MATHEMATICS****Max Marks: 100****SECTION-I (SINGLE CORRECT ANSWER TYPE)**

This section contains **20 Multiple Choice Questions**. Each question has 4 options (1), (2), (3) and (4) for its answer, out of which **ONLY ONE** option can be correct.

**Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases.**

- The area bounded by  $y = x^3 - x$  and  $y = x^2 + x$  is  
 1) 37                      2)  $\frac{37}{12}$                       3)  $\frac{12}{37}$                       4)  $\frac{37}{4}$
- The area of the figure bounded by the parabolas  $x = -2y^2, x = 1 - 3y^2$  is  
 1)  $\frac{4}{5}$                       2)  $\frac{3}{5}$                       3)  $\frac{4}{3}$                       4)  $\frac{2}{3}$
- The area of the region enclosed by the curves  $y = x \log x$  and  $y = 2x - 2x^2$  is  
 1)  $\frac{7}{11}$                       2)  $\frac{11}{12}$                       3)  $\frac{7}{12}$                       4)  $\frac{11}{17}$
- The area bounded by  $y = \frac{1}{x^2 - 2x + 2}$  and x-axis is  
 1)  $\pi$                       2)  $2\pi$                       3)  $3\pi$                       4) 0
- If the solution of the Differential Equation  $(2x + 3y - 2)dx + (4x + 6y - 7)dy = 0$ ,  $y(0) = 3$  is  $Ax + By + 3 \log_e |2x + 3y - k| = 6$  Then  $A + 2B + 5k =$   
 1) 41                      2) 43                      3) 29                      4) 45
- Solve the differential equation  $xy \frac{dy}{dx} = \frac{1 + y^2}{1 + x^2} (1 + x + x^2)$   
 1)  $\sqrt{1 + y^2} = c.x.e^{\tan^{-1} x}$                       2)  $\sqrt{1 + y^2} = c.e^{\tan^{-1} x}$   
 3)  $\sqrt{1 + y^2} = c.e^{-\tan^{-1} x}$                       4)  $\sqrt{1 + y^2} = c.x$
- Solve  $\left(x \sin \frac{y}{x}\right) dy = \left(y \sin \frac{y}{x} - x\right) dx$ .  
 1)  $\cos \frac{y}{x} = e^x + c$     2)  $\cos \frac{y}{x} = \log_e x + c$     3)  $\cos \frac{y}{x} + \log_e x = c$     4)  $\cos \frac{y}{x} + e^x = c$

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**MARATHI**



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8. Solve  $(x + 2y^3) \frac{dy}{dx} = y$

- 1)  $x = y^3 + cy$       2)  $x = y^3 - cy$       3)  $x = 2y^3 + c$       4)  $x = 2y^3 + cy$

9. Solve  $xdx + ydy = \frac{xdy - ydx}{x^2 + y^2}$

- 1)  $x^2 + y^2 = e^{\tan^{-1}\left(\frac{y}{x}\right)} + c$       2)  $(x^2 + y^2) = \tan^{-1}\left(\frac{y}{x}\right) + c$   
 3)  $\frac{1}{2}(x^2 - y^2) = \tan^{-1}\left(\frac{y}{x}\right) + c$       4)  $\frac{1}{2}(x^2 + y^2) = \tan^{-1}\left(\frac{y}{x}\right) + c$

10. Let  $y = y(x)$  be the solution of the differential equation

$\frac{dy}{dx} + 3(\tan^2 x)y + 3y = \sec^2 x, y(0) = \frac{1}{3} + e^3$ . Then  $y\left(\frac{\pi}{4}\right)$  is equal to

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

11. The area of the region enclosed by the curve  $f(x) = \max\{\sin x, \cos x\}, 0 \leq x \leq \pi$  and the x-axis is

- 1)  $\sqrt{2} - 1$       2)  $\sqrt{2} + 1$       3)  $2\sqrt{2} - 1$       4)  $2(\sqrt{2} + 1)$

12. Let  $f$  be a differentiable function such that  $f'(x) = 7 - \frac{3f(x)}{4x} (x > 0)$  and  $f(1) \neq 4$

Then  $\lim_{x \rightarrow 0^+} \left( x \cdot f\left(\frac{1}{x}\right) + 3 \right) =$

- 1) 7      2) 4      3) does not exist      4) 0

13. The solution of the differential equation  $\frac{d^2y}{dx^2} = \sin 3x + e^x + x^2$  when  $y_1(0) = 1$  and  $y(0) = 0$  is

- 1)  $\frac{-\sin 3x}{9} + e^x + \frac{x^4}{12} + \frac{1}{3}x - 1$       2)  $\frac{-\sin 3x}{9} + e^x + \frac{x^4}{12} + \frac{1}{3}x$   
 3)  $\frac{-\cos 3x}{3} + e^x + \frac{x^4}{12} + \frac{1}{3}x + 1$       4)  $\frac{-\cos 3x}{3} + e^x - \frac{x^4}{12} + \frac{1}{3}x - 1$





14. The differential equation  $\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{y}$  determines a family of circles with
- 1) variable radii and a fixed centre (0,1)
  - 2) variable radii and a fixed centre (0,-1)
  - 3) fixed radius 1 and variable centres along the x-axis
  - 4) fixed radius 1 and variable centres along the y-axis.
15. Let  $y = f(x)$  be the solution of the Differential equation  $(xy - 5x^2\sqrt{1+x^2})dx + (1+x^2)dy = 0$ ,  $y(0) = 0$  and  $y(\sqrt{3})$  is equal to  $\frac{\alpha\sqrt{3}}{\beta}$  ( $\alpha, \beta$  are prime). Then  $\alpha + \beta =$
- 1) 5
  - 2) 2
  - 3) 3
  - 4) 7
16. The solution of the equation  $\frac{dy}{dx} = \cos(x-y)$  is
- 1)  $y + \cot\left(\frac{x-y}{2}\right) = C$
  - 2)  $x + \cot\left(\frac{x-y}{2}\right) = C$
  - 3)  $x + \tan\left(\frac{x-y}{2}\right) = C$
  - 4)  $y + \tan\left(\frac{x-y}{2}\right) = c$
17. The equation of the curve whose subnormal is equal to a constant  $a$  is
- 1)  $y = ax + b$
  - 2)  $y^2 = 2ax + 2b$
  - 3)  $ay^2 - x^3 = a$
  - 4)  $y^2 = ax + b$
18. The degree and order of the differential equation of all parabolas whose axis is x-axis are
- 1) 2,1
  - 2) 1,2
  - 3) 3,2
  - 4) 1,1
19. Statement-1: The differential equation corresponding to the family of circles having their centres on y-axis and fixed radius  $K$  is  $(x^2 - k^2)\left(\frac{dy}{dx}\right)^2 + x^2 = 0$
- Statement-2: The differential equation of corresponding to the family of circles passing through the origin and having their centres on x-axis is  $x^2 - y^2 + 2xy\frac{dy}{dx} = 0$ . Then
- 1) Statement 1 is true, Statement 2 is true
  - 2) Statement 1 is false, Statement 2 is true
  - 3) Statement 1 is true, Statement 2 is false
  - 4) Statement 1 is false, Statement 2 is false.

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20. Match the differential equations in List-I to their Integrating factors in List-II

	List-I		List-II
p)	$(x^3 + 1) \frac{dy}{dx} + x^2 y = 3x^2$	1)	$x^3$
q)	$x^2 \frac{dy}{dx} + 3xy = x^6$	2)	$(x^3 + 1)^2$
r)	$(x^3 + 1)^2 \frac{dy}{dx} + 6x^2(x^3 + 1)y = x^2$	3)	$(x^2 + 1)^2$
s)	$(x^2 + 1) \frac{dy}{dx} + 4xy = \log x$	4)	$x^2 + 1$
		5)	$(x^3 + 1)^{1/3}$
		6)	$(x^3 + 1)^{1/2}$

The correct answer is

1)  $p-4, q-1, r-2, s-3$

3)  $p-5, q-1, r-2, s-3$

3)  $p-5, q-2, r-3, s-6$

4)  $p-5, q-1, r-3, s-4$

### SECTION-II (NUMERICAL VALUE TYPE)

This section contains **5 Numerical Value Type Questions**. The Answer should be within **0 to 9999**. If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i.e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11**).

**Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases.**

21. If  $y = 2x + K$  is a solution of  $y = x \frac{dy}{dx} + \left( \frac{dy}{dx} \right)^3 + \left( \frac{dy}{dx} \right)^2$  then  $K =$  \_\_\_\_\_

22. If the area (in sq. units) of the region bounded by the curves  $y^2 - 2y = -x, x + y = 0$  is  $A$  then  $6A =$  \_\_\_\_\_

23. Let  $\int_0^x \sqrt{1 - (y'(t))^2} dt = \int_0^x y(t) dt, 0 \leq x \leq 3, y \geq 0, y(0) = 0$  Then at  $x = 2$ ,  $y'' + y + 5 =$  \_\_\_\_\_

24. Let  $A$  be the Region enclosed by the Parabola  $y^2 = 2x$  and the line  $x = 24$ . Then the maximum Area of the Rectangle inscribed in the Region  $A$  is \_\_\_\_\_

25. If  $y(t)$  is a solution of  $(1+t) \frac{dy}{dt} - ty = 1$  and  $y(0) = -1$  then  $y(1) + \frac{1}{2} =$  \_\_\_\_\_

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## PHYSICS

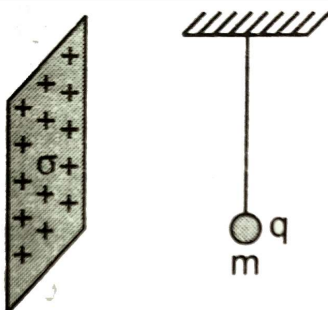
Max Marks: 100

## SECTION-I (SINGLE CORRECT ANSWER TYPE)

This section contains **20 Multiple Choice Questions**. Each question has 4 options (1), (2), (3) and (4) for its answer, out of which **ONLY ONE** option can be correct.

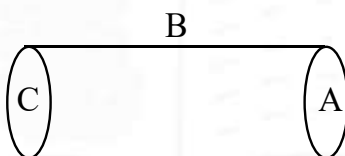
**Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases.**

26. A small charged particle of mass  $m$  and charge  $q$  is suspended by an insulated thread in front of a very large conducting charged sheet of uniform surface density of charge  $\sigma$ . The angle made by the thread with the vertical in equilibrium is :



- 1)  $\tan^{-1}\left(\frac{\sigma q}{2\epsilon_0 mg}\right)$  2)  $\tan^{-1}\left(\frac{q}{q\epsilon_0 mg}\right)$  3)  $\tan^{-1}\left(\frac{q}{2\sigma\epsilon_0 mg}\right)$  4) Zero

27. A hollow cylinder has a charge  $q$  coulomb within it. If  $\phi$  is the electric flux in units of V-m associated with the curved surface B, the flux linked with the plane surface A in unit of V-m will be :



- 1)  $\frac{q}{2\epsilon_0}$  2)  $\frac{\phi}{3}$  3)  $\frac{q}{\epsilon_0} - \phi$  4)  $\frac{1}{2}\left(\frac{q}{\epsilon_0} - \phi\right)$

28. A parallel plate capacitor of capacitance  $1\mu F$  is charged to a potential difference of 20V. The distance between plates is  $1\mu m$ . The energy density between plates of capacitors is :

- 1)  $1.8 \times 10^3 J/m^3$  2)  $2 \times 10^{-4} J/m^3$  3)  $2 \times 10^2 J/m^3$  4)  $1.8 \times 10^5 J/m^3$

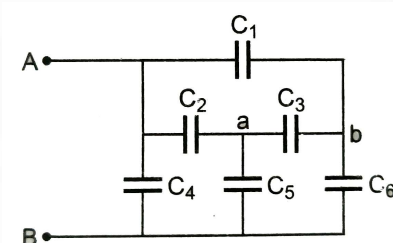




29. A parallel plate capacitor of capacitance  $2F$  is charged to a potential  $V$ . The energy stored in the capacitor is  $E_1$ . The capacitors is now connected to another uncharged identical capacitor in parallel combination. The energy stored in the combination is  $E_2$ . The ratio  $E_2 / E_1$  is

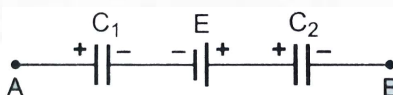
1) 2:1                      2) 1:2                      3) 1:4                      4) 2:3

30. Six equal capacitors each of capacitance  $C$  are connected as shown in the figure. Then the equivalent capacitance between A and B is :



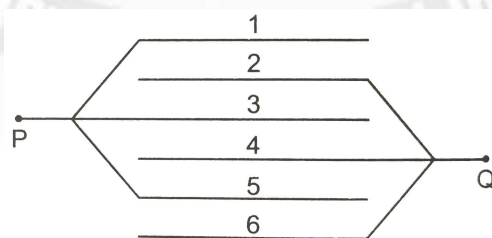
1)  $6C$                       2)  $C$                       3)  $2C$                       4)  $C/2$

31. A circuit has a section AB as shown in the figure. If the potential difference between points A and B is  $V$  volt, then potential difference across  $C_1$  is :



1)  $(V - E)C_1$                       2)  $(V + E)C_2$                       3)  $(V + E)C_2 / (C_1 + C_2)$                       4)  $(V - E)C_1 / (C_1 + C_2)$

32. Six metallic plates each with a surface area of one side  $A$ , are placed at a distance  $d$  from each other. The alternate plates are connected to points P and Q as shown in figure. The capacitance of the system is :



1)  $\epsilon_0 A / d$                       2)  $5\epsilon_0 A / d$                       3)  $6\epsilon_0 A / d$                       4)  $\epsilon_0 A / 5d$

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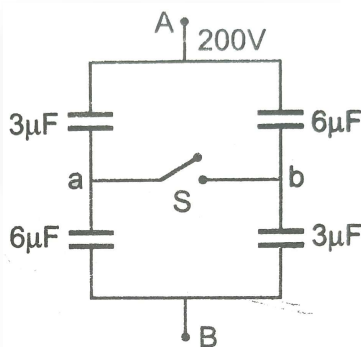
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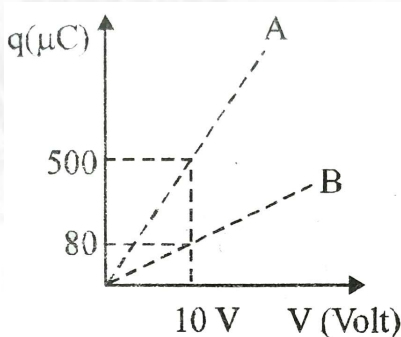
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33. In the circuit diagram, potential difference between points A and B is 200 volt, the potential difference between points a and b when the switch S is open, is :



- 1) 100 volt      2)  $\frac{200}{3}$  volt      3)  $\frac{100}{3}$  volt      4) 50 volt
34. Figure show charge (q) versus voltage (V) graph for series and parallel combination of two given capacitors. The capacitances are :



- 1)  $40\mu F$  and  $10\mu F$       2)  $60\mu F$  and  $40\mu F$       3)  $50\mu F$  and  $30\mu F$       4)  $20\mu F$  and  $30\mu F$
35. An infinitely long wire has uniform linear charge density  $\lambda = 2nC / m$ . The net flux through a Gaussian cube of side length  $\sqrt{3}$  cm, if the wire passes through any two corners of the cube, that are maximally displaced from each other, would be  $xNm^2C^{-1}$ , where x is :
- [Neglect any edge effects and use  $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9$  SI units]
- 1)  $0.72\pi$       2)  $1.44\pi$       3)  $6.48\pi$       4)  $2.16\pi$

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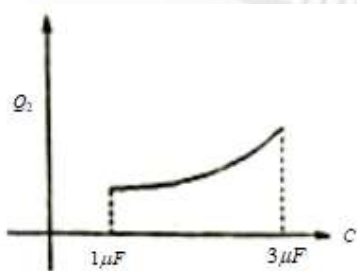
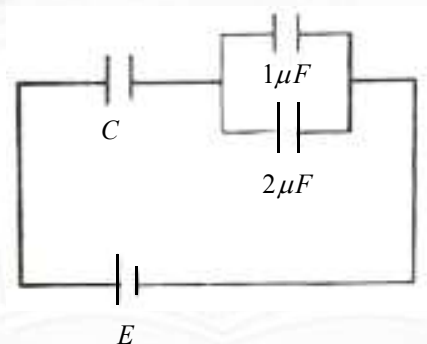
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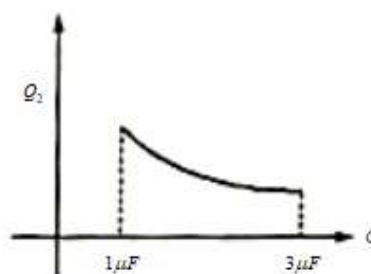
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36. An infinite plane sheet of charge having uniform surface charge density  $+\sigma_s C / m^2$  is placed on x-y plane. Another infinitely long line charge having uniform linear charge density  $+\lambda_e C / m$  is placed at  $z=4m$  plane and parallel to y-axis. If the magnitude values  $|\sigma_s| = 2|\lambda_e|$  then at point  $(0,0,2)$ , the ratio of magnitudes of electric field values due to sheet to that of line charge is  $\pi\sqrt{n} : 1$ . The value of n is \_\_\_\_\_
- 1) 12                      2) 16                      3) 14                      4) 18
37. A parallel plate capacitor of capacitance  $90pF$  is connected to a battery of emf  $20V$ . If a dielectric material of dielectric constant  $k = \frac{5}{3}$  is inserted between the plates, the magnitude of the induced charge will be:
- 1)  $1.2nC$                       2)  $0.3nC$                       3)  $2.4nC$                       4)  $0.9nC$
38. In the given circuit, charge  $Q_2$  on  $2\mu F$  capacitor changes as  $C$  is varied from  $1\mu F$  to  $3\mu F$ .  $Q_2$  as a function of 'C' is given properly by: (figure are drawn schematically and are not to scale)



1)



2)

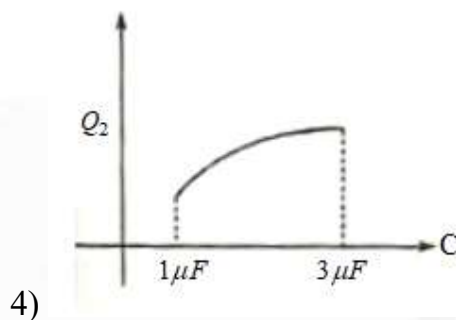
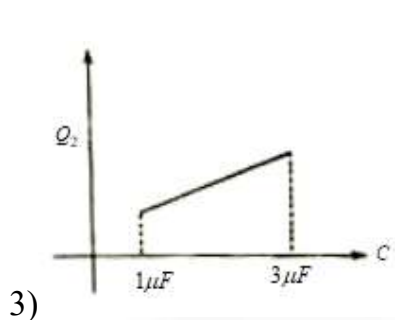
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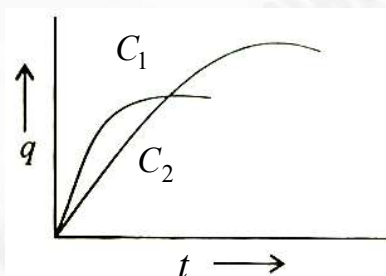
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39. Two capacitors  $C_1$  and  $C_2$  are connected in parallel to a battery. Charge-time graph is shown below for the two capacitors. The energy stored with them are  $U_1$  and  $U_2$ , respectively. Which of the given statements is true?



- 1)  $C_1 > C_2, U_1 > U_2$     2)  $C_2 > C_1, U_2 < U_1$     3)  $C_1 > C_2, U_1 < U_2$     4)  $C_2 > C_1, U_2 > U_1$
40. The mathematical form of Gauss's law is :  $\epsilon_0 \oint \vec{E} \cdot d\vec{S} = q$   
In this reference which of the following is correct?
- 1) E depends on the charge q which is enclosed within the Gaussian surface only
  - 2) E depends on the charge which is inside and outside the Gaussian surface
  - 3) E does not depends on the magnitude of charge q
  - 4) All of the above
41. Assertion (A): A parallel plane capacitor is connected across battery through a key. A dielectric slab of dielectric constant K is introduced between the plates. The energy which is stored becomes K times.  
Reason (R): The surface density of charge on the plate remains constant or unchanged.
- 1) If both assertion and reason are true and reason is the correct explanation of assertion.
  - 2) If both assertion and reason are true but reason is not the correct explanation of assertion.
  - 3) If assertion is true but reason is false
  - 4) If both assertion and reason are false



42. Assertion (A): A point charge is lying at the centre of a cube of each side  $l$ . The electric flux emanating from each surface of the cube is  $(1/6)$ th of total flux.
- Reason (R) : According to Gauss theorem, total electric flux through a closed surface enclosing a charge is equal to  $(1/\epsilon_0)$  times the magnitude of the charge enclosed.
- 1) If both assertion and reason are true and reason is the correct explanation of assertion.
  - 2) If both assertion and reason are true but reason is not the correct explanation of assertion.
  - 3) If assertion is true but reason is false
  - 4) If both assertion and reason are false
43. Statement 1: When charges are shared between two bodies, there occurs no loss of charge but there does occur a loss of energy.
- Statement 2: In case of sharing of charges, conservation of energy fails.
- 1) Statement 1 is true, Statement 2 is true, Statement 2 is the correct explanation of Statement 1.
  - 2) Statement 1 is false, Statement 2 is true
  - 3) Statement 1 is true, Statement 2 is false.
  - 4) Statement 1 is true, Statement 2 is true, Statement 2 is not the correct explanation of Statement 1.
44. Statement 1: It is not possible to make a sphere of capacity 1 farad using a conducting material.
- Statement 2: It is possible for earth as its radius is  $6.4 \times 10^6 m$ .
- 1) Statement 1 is true, Statement 2 is true, Statement 2 is the correct explanation of Statement 1.
  - 2) Statement 1 is false, Statement 2 is true
  - 3) Statement 1 is true, Statement 2 is true, Statement 2 is not the correct explanation of Statement 1.
  - 4) Statement 1 is true, Statement 2 is false.





## 45. Match List-I with List-II

	Column-I		Column-II
A)	Electric field inside (distance $r > 0$ from centre) of a uniformly charged spherical shell with surface charge density $\sigma$ , and radius $R$ .	I)	$\frac{\sigma}{\epsilon_0}$
B)	Electric field at distance $r > 0$ from a uniformly charged infinite plane sheet with surface charge density $\sigma$	II)	$\frac{\sigma}{2\epsilon_0}$
C)	Electric field outside (distance $r > 0$ from centre) of a uniformly charged spherical shell with surface charge density $\sigma$ , and radius $R$	III)	0
D)	Electric field between 2 oppositely charged infinite plane parallel sheets with uniform surface charge density $\sigma$	IV)	$\frac{\sigma R^2}{\epsilon_0 r^2}$

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

2)  $A-IV, B-II, C-III, D-I$

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

4)  $A-III, B-II, C-IV, D-I$

**SECTION-II (NUMERICAL VALUE TYPE)**

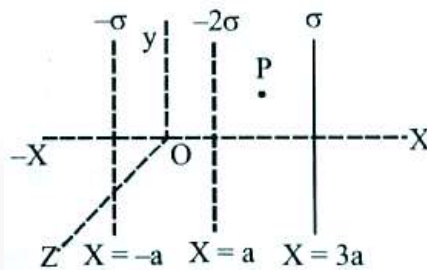
This section contains **5 Numerical Value Type Questions**. The Answer should be within **0 to 9999**. If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i.e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11**).

**Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases**

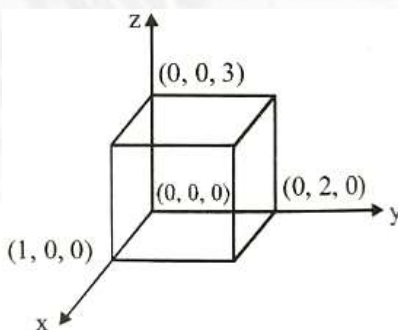
46. A parallel plate capacitor is filled by a dielectric whose relative permittivity varies with the applied voltage ( $V$ ) as  $\epsilon = \alpha V$ , where  $\alpha = 2V^{-1}$ . A similar capacitor with no dielectric is charge to  $V_0 = 78V$ . It is then connected to the uncharged capacitor with the dielectric. Final voltage on the capacitor is \_\_\_\_\_

47. Three infinitely long charged thin sheets are placed as shown in figure. The magnitude of electric field at the point P is  $\frac{x\sigma}{\epsilon_0}$ . The value of  $x$  is \_\_\_\_\_ (all quantities are measured in SI units).

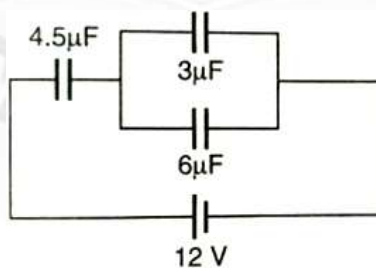




48. A particle of charge  $-q$  and mass  $m$  moves in a circle of radius  $r$  around an infinitely long line charge of linear charge density  $+\lambda$ . If the time period is  $T = 2\pi r \sqrt{\frac{m}{\alpha k \lambda q}}$ , then  $\alpha$  is (consider  $K$  as coulombs constant)
49. As shown in figure, a cuboid lies in a region with electric field  $E = 2x^2\hat{i} - 4y\hat{j} + 6\hat{k}$  N/C. The magnitude of charge within the cuboid is  $n \epsilon_0 C$ . The value of  $n$  is \_\_\_\_\_ (If cuboid has dimensions  $1 \times 2 \times 3 m^3$ )



50. In the circuit shown in the figure, the potential difference across the  $4.5 \mu F$  capacitor is \_\_\_\_\_

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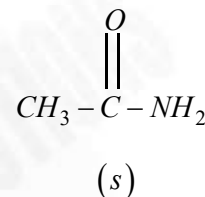
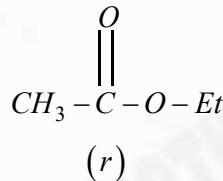
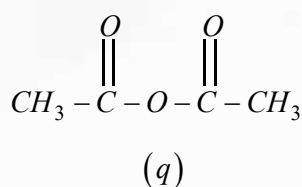
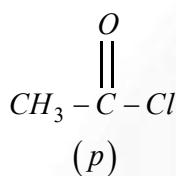
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**CHEMISTRY****Max Marks: 100****SECTION-I (SINGLE CORRECT ANSWER TYPE)**

This section contains **20 Multiple Choice Questions**. Each question has 4 options (1), (2), (3) and (4) for its answer, out of which **ONLY ONE** option can be correct.

**Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases.**

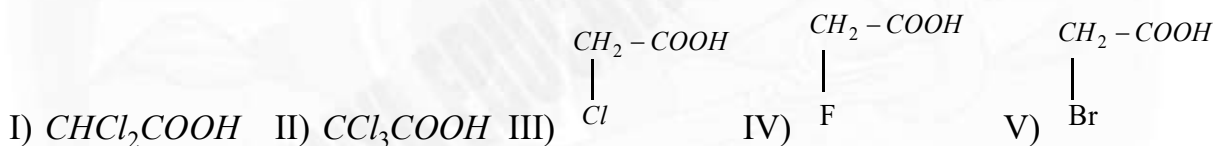
51. Consider the following molecules



The correct order of rate of hydrolysis

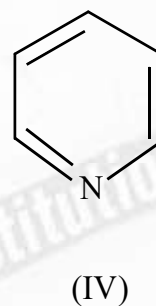
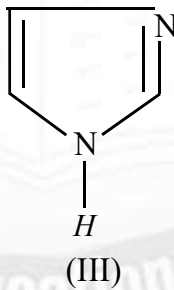
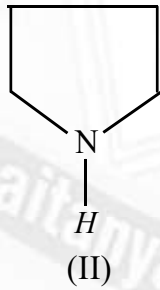
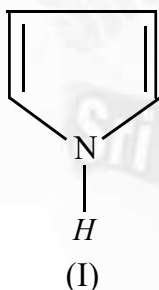
- 1)  $p < q < r < s$     2)  $s < r < q < p$     3)  $p < q < s < r$     4)  $s < r < p < q$

52. The decreasing order of acidity for the following carboxylic acid



- 1)  $\text{II} > \text{IV} > \text{I} > \text{III} > \text{V}$     2)  $\text{II} > \text{I} > \text{III} > \text{IV} > \text{V}$   
 3)  $\text{II} > \text{I} > \text{IV} > \text{III} > \text{V}$     4)  $\text{II} > \text{IV} > \text{I} > \text{V} > \text{III}$

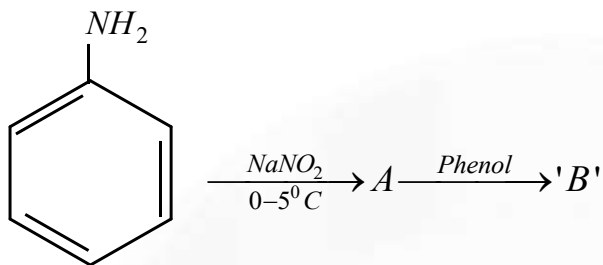
53. The decreasing order of basicity of the following compounds is



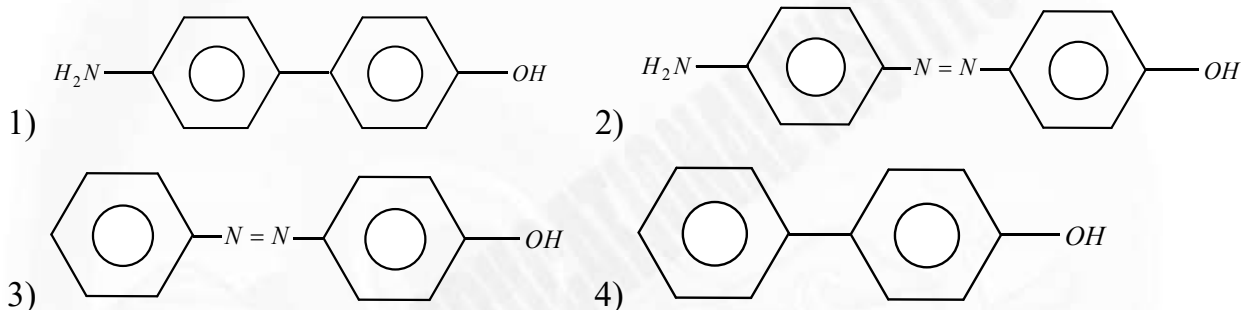
- 1)  $\text{II} > \text{III} > \text{IV} > \text{I}$     2)  $\text{II} > \text{III} > \text{I} > \text{IV}$   
 3)  $\text{III} > \text{II} > \text{IV} > \text{I}$     4)  $\text{III} > \text{II} > \text{I} > \text{IV}$



54. Consider the following sequence of reaction



The product B is



55. Assertion (A) : Secondary Amines have less boiling point than tertiary amines having same molecular weight.

Reason (R) : Molecules of secondary amines held with one another by H-bonding.

- 1) If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.
- 2) If both Assertion and Reason are true and the Reason is not a correct explanation of the Assertion.
- 3) Assertion is true and Reason is false.
- 4) Assertion is false and Reason is true.

56. Assertion (A) : Acetamide has more polar  $\text{>C=O}$  group than ethyl acetate.

Reason (R) :  $\text{NH}_2$  is more electron donating than  $\text{OC}_2\text{H}_5$ .

- 1) If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.
- 2) If both Assertion and Reason are true and the Reason is not a correct explanation of the Assertion.
- 3) If Assertion is true but Reason is false.
- 4) If both Assertion and Reason are false.



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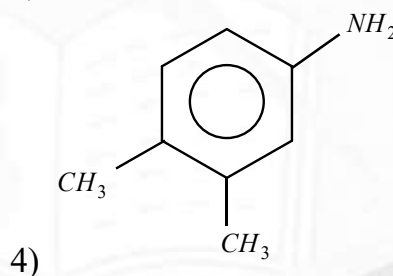
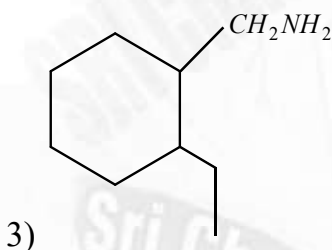
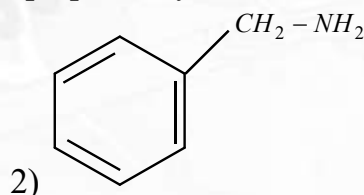
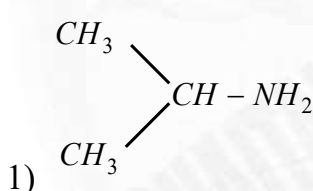
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57. Statement-I : Aryl amines are generally less basic than alkyl amines because the nitrogen lone pair electrons are delocalized by interaction with Aromatic ring  $\pi$  electron system.  
Statement-II : Primary Aromatic amines reacts with  $HNO_2$  to form diazonium salts which are stable even above 300K.
- 1) Statement-I is true, Statement-II is false
  - 2) Both Statement-I and Statement-II are false
  - 3) Statement-I is false, Statement-II is true
  - 4) Both Statement-I and Statement-II are true
58. Statement-I : Carboxylic acids have higher boiling points than aldehydes, ketones and even alcohols of comparable molecular masses. It is due to their formation of intramolecular H-bonding.  
Statement-II : The solubility of mono carboxylic acids in water decreases with increase in molecular mass.
- 1) Statement-I is true, Statement-II is false
  - 2) Both Statement-I and Statement-II are false
  - 3) Statement-I is false, Statement-II is true
  - 4) Both Statement-I and Statement-II are true
59. Which among the following can not be prepared by Gabriel-Phthalimide reaction?



60. Match Column-I with Column-II

Column-I	Column-II
I) Ammonolysis	p) Amine with lesser number of carbon atoms.
II) Gabriel phthalimide synthesis	q) Detection test for primary amines
III) Hoffmann bromamide reaction	r) Reaction of phthalimide with KOH and R-X
IV) Carbylamine reaction	s) Reaction of alkylhalides with $NH_3$

1) I - s, II - r, III - p, IV - q

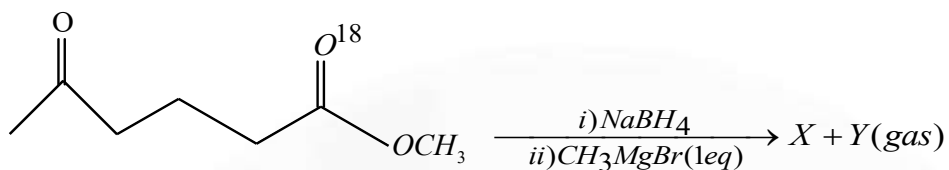
2) I - r, II - p, III - r, IV - s

3) I - q, II - r, III - s, IV - p

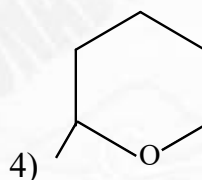
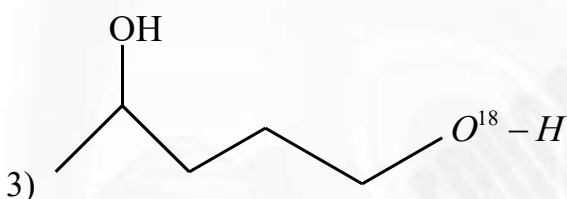
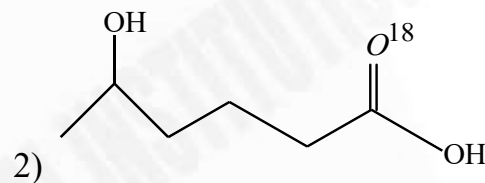
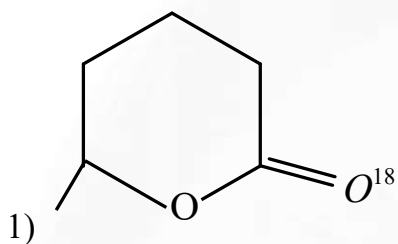
4) I - s, II - p, III - q, IV - r



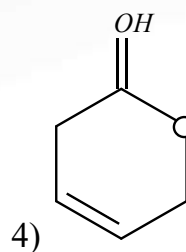
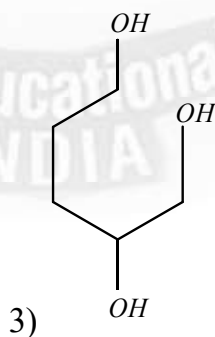
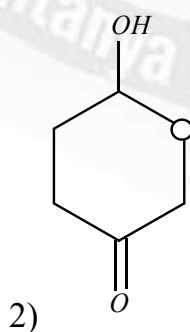
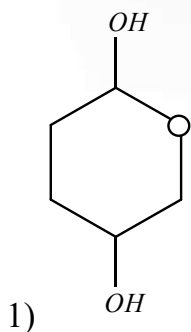
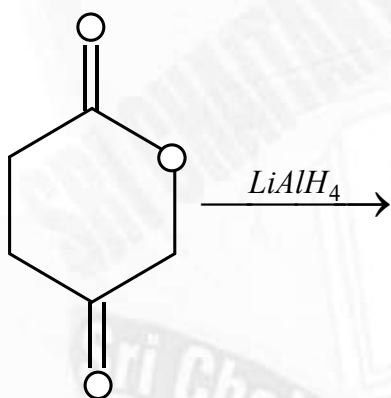
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Major Product (X) is :



62.

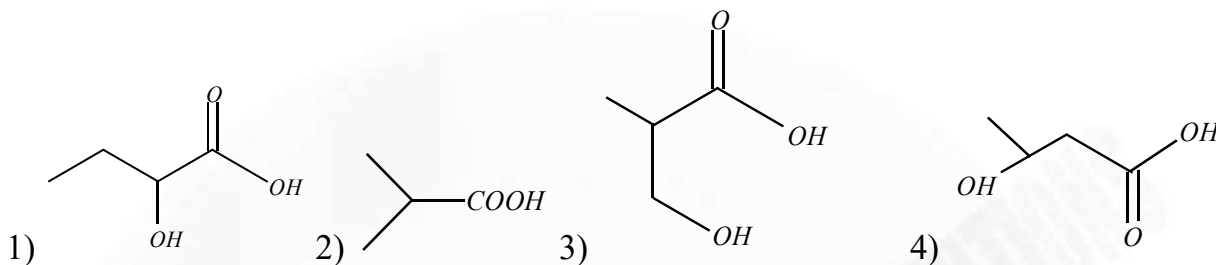


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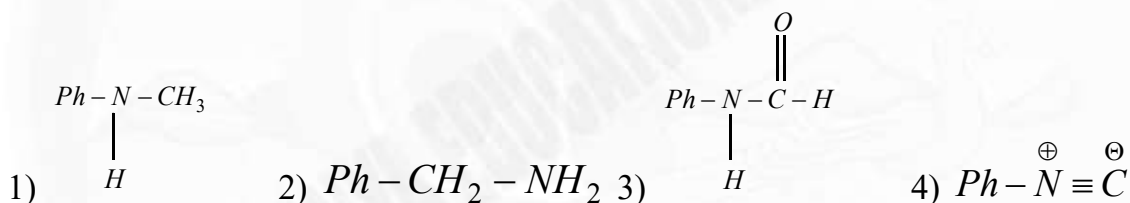
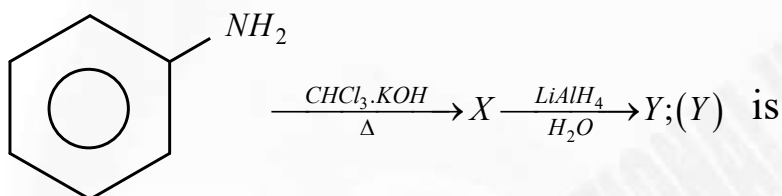
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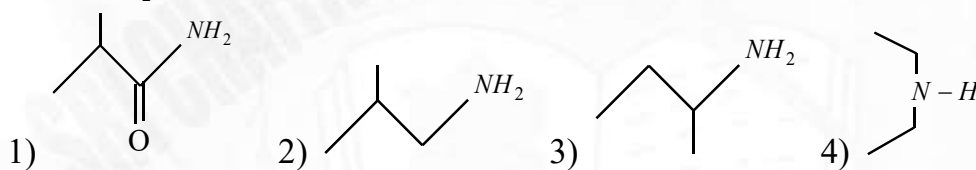
63. An optically active compound 'X' having molecular formula  $C_4H_8O_3$ . It evolves  $CO_2$  with  $NaHCO_3$ . 'X' on reaction with  $LiAlH_4$  give achiral compound. 'X' is :



64.

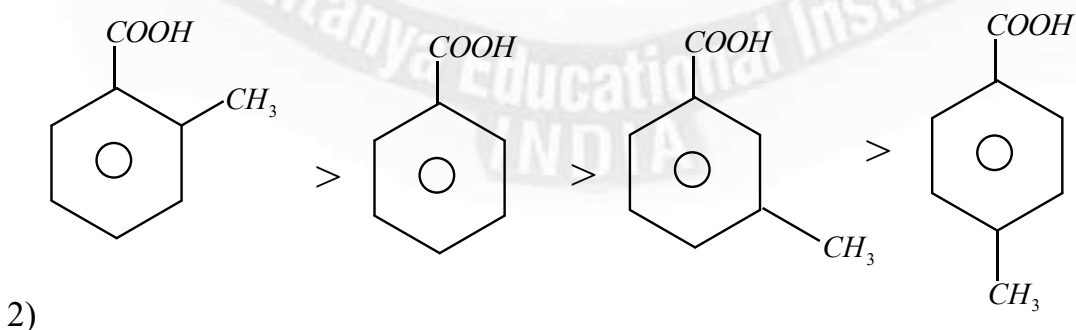


65. Which one among the following is expected to form a secondary alcohol on treatment with  $HNO_2$ ?



66. Which of the following arrangements is incorrect with respect to the property of the compounds indicated in the parentheses?

- 1)  $HCOOH > CH_3COOH > CH_3CH_2COOH$  (Acidic strength)

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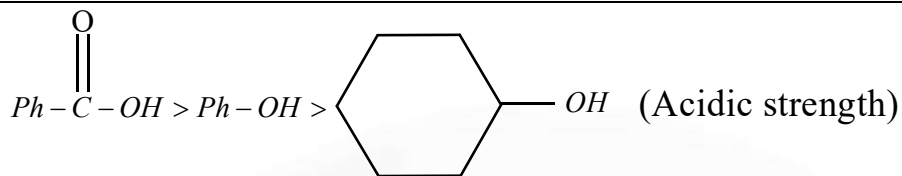
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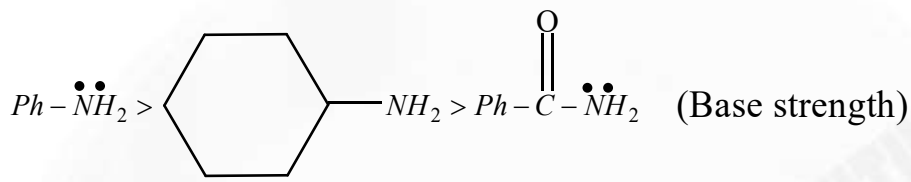
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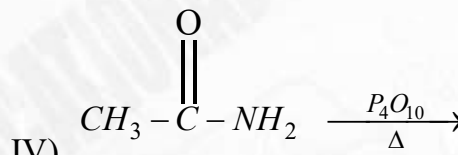
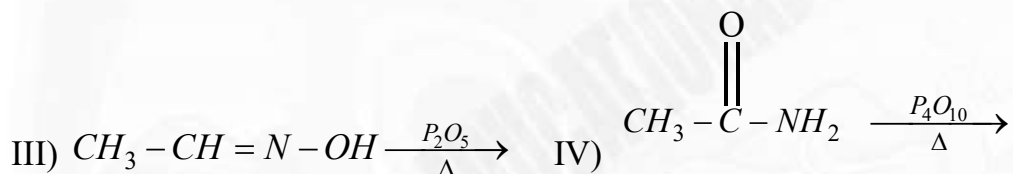
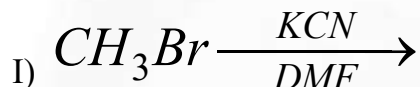


3)



4)

67. By which of the following reactions can methyl cyanide be prepared?



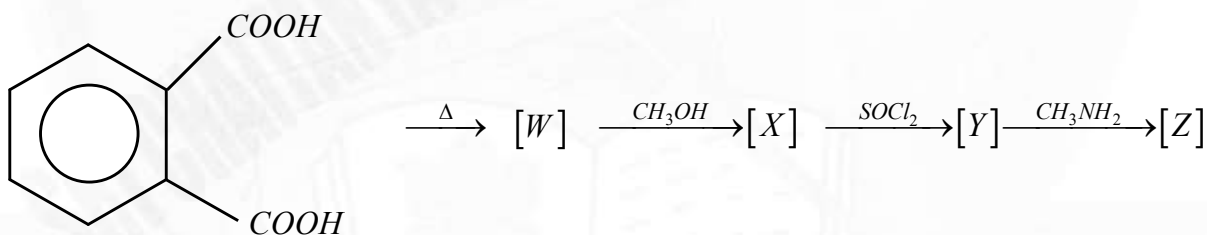
1) Only I

2) Only II

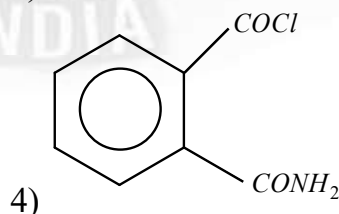
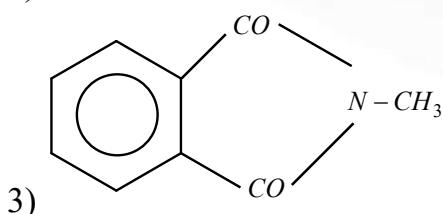
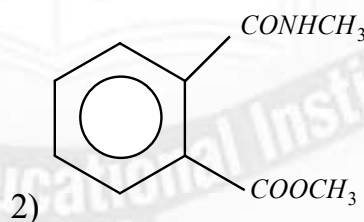
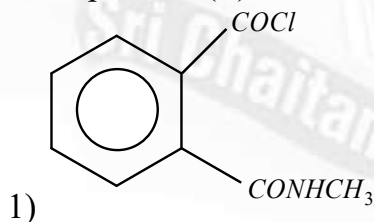
3) I,II,III,IV

4) Only I, III, IV

68.



Final product (Z) is



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Page 20



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**THE PERFECT HAT-TRICK WITH ALL-INDIA RANK 1**  
**IN JEE MAIN 2023 JEE ADVANCED 2023 AND NEET 2023**

**JEE MAIN**  
**2023**

SINGARAJU  
VENKAT KUMARINNYA  
Sri Chaitanya  
JEE-12th Class  
**300**  
**300**  
MARKS



**RANK**  
**1**

**JEE Advanced**  
**2023**

VAVILALA  
DHRUVILAS REDDY  
Sri Chaitanya  
JEE-12th Class  
**341**  
**360**  
MARKS



**RANK**  
**1**

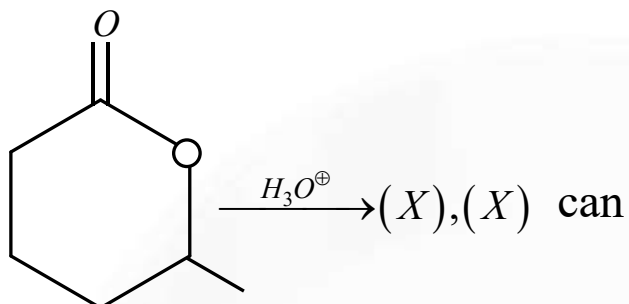
**NEET**  
**2023**

BORA VARUN  
CHAKRAVARTHI  
Sri Chaitanya  
JEE-12th Class  
**720**  
**720**  
MARKS



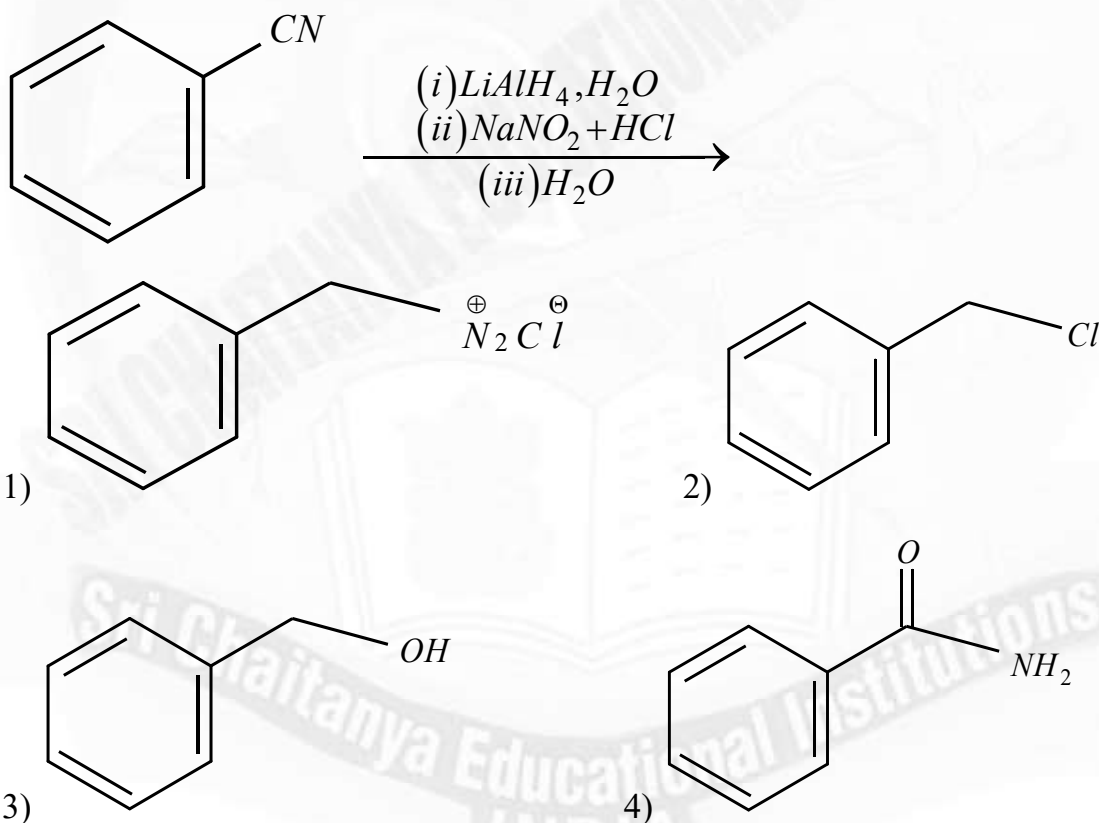
**RANK**  
**1**

69.



- 1) Gives only 2,4 DNP test                      2) Give only  $NaHCO_3$  test  
 3) Gives only Fehling test                      4) Gives  $NaHCO_3$  test and also reacts with NaOH

70. The product formed the following reaction sequence is

**SECTION-II (NUMERICAL VALUE TYPE)**

This section contains **5 Numerical Value Type Questions**. The Answer should be within **0 to 9999**. If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i.e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11**).

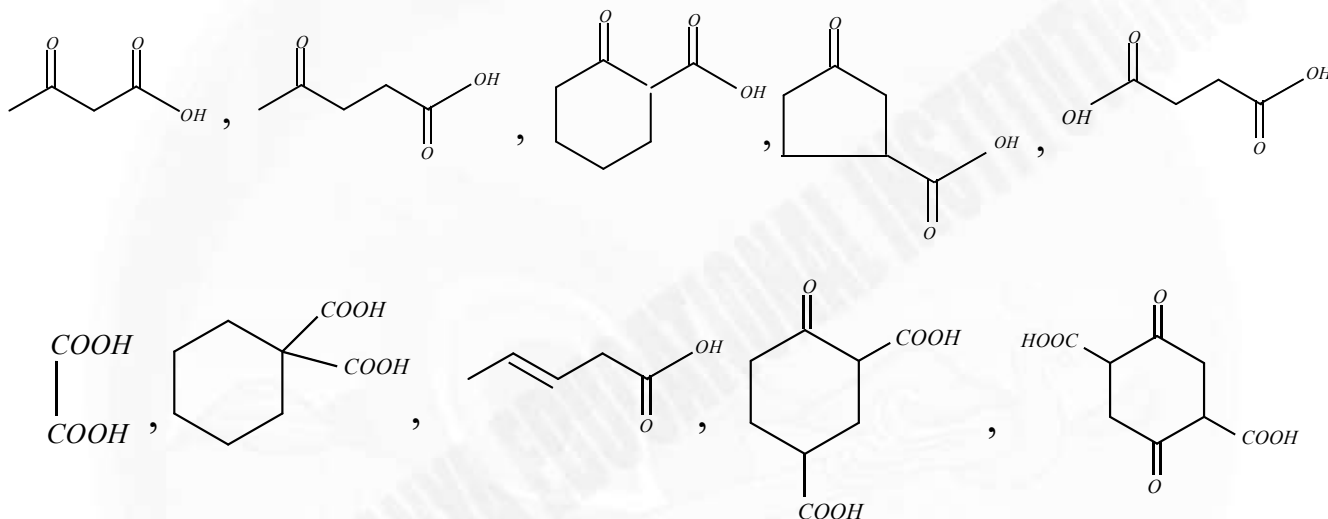
**Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases**

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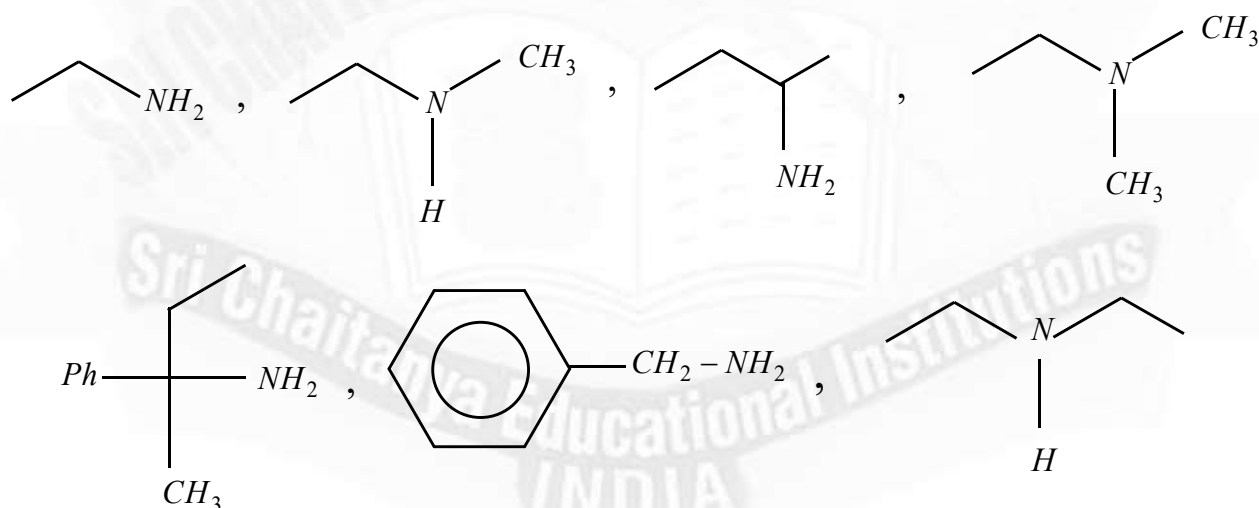
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71. The number of compounds given below which contains  $-COOH$  groups
- a) Sulphanilic acid   b) Picric acid   c) Aspirin   d) Glycolic acid  
e) Malonic acid   f) succinic acid   g) Adipic acid   h) Maleic acid
72. Examine the structure of following compounds, and find out number of compounds that will undergo decarboxylation in presence of heat.

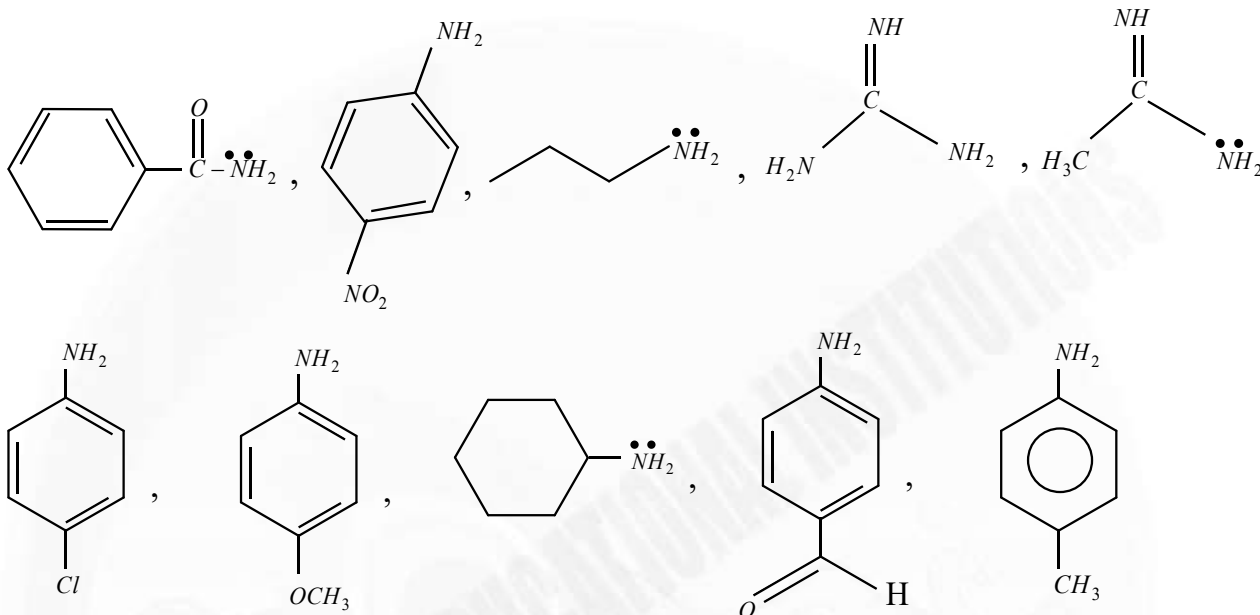


73. Of the following amines how many can be separated by Hofmann's mustard oil reaction?

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SRI CHAITANYA  
JEE-12th Class**341  
360**  
MARKS**RANK****1****NEET  
2023**BORA VARUN  
CHAKRAVARTY  
SRI CHAITANYA  
JEE-12th Class**720  
720**  
MARKS**RANK****1**



74. Examine the structural formulas of following compounds and identify how many compounds are more basic than aniline



75. The total number of reagents from those given below, that can convert nitrobenzene into aniline is \_\_\_\_\_
- I)  $\text{Sn} - \text{HCl}$       II)  $\text{Sn} - \text{NH}_4\text{OH}$       III)  $\text{Fe} - \text{HCl}$   
IV)  $\text{Zn} - \text{HCl}$       V)  $\text{H}_2$  - Raney Nickel      VI)  $\text{H}_2 - \text{Pd}$   
VII)  $\text{LiAlH}_4$       VIII)  $\text{NaBH}_4$

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Sri Chaitanya  
JEE-12th Class**341  
360**  
MARKS

RANK

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300  
MARKS

**VANGALA AJAY REDDY**  
APP. NO. 250302285592  
CLASSROOM STUDENT FROM GRADE 11 - XII

**1**  
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**300**  
300  
MARKS

**DEVUTTAM MAJHI**  
APP. NO. 250301008185  
DLP/AITS STUDENT

**9**  
ALL INDIA OPEN CATEGORY RANK

**295**  
300  
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**TOSHNIWAL SHIVEN**  
APP. NO. 2503010391420  
DLP/AITS STUDENT

**10**  
ALL INDIA OPEN CATEGORY RANK

**295**  
300  
MARKS

**SAKSHAM JINDAL**  
APP. NO. 2503010236696  
DLP/AITS STUDENT

BELOW  
100  
ALL INDIA OPEN  
CATEGORY RANKS

**31**

BELOW  
500  
ALL INDIA OPEN  
CATEGORY RANKS

**95**

BELOW  
10  
ALL INDIA CATEGORY  
RANKS COUNT

**10**

BELOW  
100  
ALL INDIA CATEGORY  
RANKS COUNT

**98**

BELOW  
1000  
ALL INDIA CATEGORY  
RANKS COUNT

**579**

**TOTAL QUALIFIED RANKS  
FOR JEE ADVANCED-2025**

**22,094**

\*DLP/AITS

# JEE 2025 STARS SHINE BRIGHT

## Sri Chaitanya Tops JEE ADVANCED

### ALL INDIA OPEN CATEGORY RANKS

**AIR**  
**1**

**RUTVIK SAI**  
H.T.No. 256055278 (OBC-NCL)

**AIR**  
**3**

**MAJID MUJAHID HUSAIN**  
H.T.No. 251134112\*

**AIR**  
**5**

**UJJWAL KESARI**  
H.T.No. 252016104\*

**AIR**  
**6**

**AKSHAT KUMAR CHAURASIA**  
H.T.No. 254065055\*

BELOW  
100  
ALL INDIA OPEN  
CATEGORY RANKS

**29**

BELOW  
500  
ALL INDIA OPEN  
CATEGORY RANKS

**113**

BELOW  
1000  
ALL INDIA OPEN  
CATEGORY RANKS

**205**

BELOW  
1000  
ALL INDIA CATEGORY  
RANKS COUNT

**745**

**NUMBER OF  
QUALIFIED RANKS**  
**4,212**

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