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A right Choice for the Real Aspirant

ICON Central Office - Madhapur - Hyderabad

SEC: Sr.Super60_STERLING BT	**JEE-MAIN**	**Date: 21-09-2025**
Time: 02:00PM to 05:00PM	**CTM-03**	**Max. Marks: 300**

IMPORTANT INSTRUCTION:

1. Immediately fill in the Admission number on this page of the Test Booklet with **Blue/Black** Ball Point **Pen** only.
2. The candidates should not write their Admission Number anywhere (except in the specified space) on the Test Booklet/ Answer Sheet.
3. The test is of **3 hours** duration.!
4. The Test Booklet consists of **75 Questions.** The maximum marks are **300.**
5. 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.
6. Use **Blue / Black Point Pen only** for writing particulars / marking responses on the Answer Sheet. **Use of pencil is strictly prohibited.**
7. 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.
8. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
9. 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.**
10. **Do not fold of make any stray marks on the Answer Sheet**

Name of the Candidate (in Capital): _____

Admission Number: | | | | | | | | | |

Candidate's Signature:_____ **Invigilator's Signature:** _____

21-09-25_Sr.Super60_STERLING BT_Jee-Main_CTM-03_Test Syllabus

MATHEMATICS : Functions and Inverse Trigonometric Function , LCD , AOD , Indefinite Integration , Definite Integration , Areas and Differential Equations, 3D and Vectors

PHYSICS : Thermal physics , Experiments , Ray Optics , Heat Transfer , Geometrical Optics , Wave Optics , Gravitation , Electrostatics , Gauss law , Capacitors , Current Electricity

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

CHEMISTRY : Nomenclature, Isomerism , GOC , Alkanes , Alkene & Alkyne , Benzene , Alkyl halides & aryl halides , Alcohols , Phenols , Ethers , Aldehydes & Ketones , Amines , Carboxylic acids & derivatives , Polymers, Carbohydrates, Chemistry in Everyday Life, POC

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

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.

1. For the function $f(x)=\sin x+3x-\frac{2}{\pi}(x^2+x)$ where $x\in\left[0,\frac{\pi}{2}\right]$ consider the following two statements:

   Statement-I: f is increasing in $\left(0,\frac{\pi}{2}\right)$

   Statement-II: f' is decreasing in $\left(0,\frac{\pi}{2}\right)$ Then

   1) Statement-I is true; Statement-II is false.
   2) Statement-I is true; Statement-II is true.
   3) Statement-I is false; Statement-II is false.
   4) Statemetn-I is false; Statement-II is true.

2. If $f(x)=\left(x^{12}-x^9+x^4-x+1\right)^{-\frac{1}{2}}$ then domain of the function is _____

   1) $(1,\infty)$ 2) $(-\infty,-1)$ 3) $(-1,1)$ 4) $(-\infty,\infty)$

3. The number of real solution of (x,y) where $|y|=\sin x$, $y=\cos^{-1}(\cos x)$, $-2\pi\le x\le 2\pi$ in

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

4. The expression $\tan\left(\frac{\pi}{4}+\frac{1}{2}\cos^{-1}x\right)+\tan\left(\frac{\pi}{4}-\frac{1}{2}\cos^{-1}x\right)=$

   1) x 2) $2x$ 3) $\frac{2}{x}$ 4) $3x$

5. $\underset{x\to 0}{Lt}\dfrac{x\sqrt{y^2-(y-x)^2}}{\left(\sqrt{8xy-4x^2}+\sqrt{8xy}\right)^3}=$

   1) $\frac{1}{4}$ 2) $\frac{1}{4y}$ 3) $\frac{1}{2\sqrt{2}}$ 4) $\frac{1}{128y}$

6. If [.] denotes the greatest integer function, then match the following columns

	COLUMN - I		COLUMN - II
A)	$\int_{-1}^{1}\left[x+\left[x+\left[x\right]\right]\right]dx$	P)	3
B)	$\int_{2}^{5}\left(\left[x\right]+\left[-x\right]\right)dx$	Q)	5
C)	$\int_{-1}^{3}\mathrm{sgn}\left(x-\left[x\right]\right)dx$	R)	4
D)	$25\int_{0}^{\frac{\pi}{4}}\left(\tan^{6}\left(x-\left[x\right]\right)+\tan^{4}\left(x-\left[x\right]\right)\right)dx$	S)	-3

1) $A\to S,\ B\to S,\ C\to R,\ D\to Q$ 2) $A\to S,\ B\to P,\ C\to Q,\ D\to R$

3) $A\to R,\ B\to S,\ C\to P,\ D\to R$ 4) $A\to P,\ B\to Q,\ C\to R,\ D\to S$

7. Let $f(x)=\begin{cases}(1+ax)^{1/x} & x<0\\ 1+b & x=0\\ \dfrac{(x+4)^{1/2}-2}{(x+c)^{1/3}-2} & x>0\end{cases}$ be continuous at $x=0$, then $e^{a}bc=$

1)72 2)36 3)64 4)48

8. If $y(x)=\begin{vmatrix}\sin x & \cos x & \sin x+\cos x+1\\ 27 & 28 & 27\\ 1 & 1 & 1\end{vmatrix}$, $x\in R$ then $\dfrac{d^{2}y}{dx^{2}}+y=$

1) 1 2) – 1 3) 28 4) 27

9. Let the function $f(x)=\frac{x}{3}+\frac{3}{x}+3(x\neq 0)$ be strictly increasing in $(-\infty,\alpha_1)\cup(\alpha_2,\infty)$ and strictly decreasing in $(\alpha_3,\alpha_4)\cup(\alpha_4,\alpha_5)$ then $\sum_{i=1}^{5}\alpha_i^2$ is

1) 40 2) 36 3) 48 4) 28

10. Let $\int x^3\sin x\,dx=g(x)+c$, where c is constant of integration. If $8\left(g\left(\frac{\pi}{2}\right)+g'\left(\frac{\pi}{2}\right)\right)=\alpha\pi^3+\beta\pi^2+\gamma$; $\alpha,\beta,\gamma\in Z$, then $\alpha+\beta-\gamma=$

1) 55 2) 48 3) 62 4) 47

11. $$\int_{e^2}^{e^4}\frac{1}{x}\left[\frac{\left[e^{\left(\log_e^x\right)^2+1}\right]^{-1}}{\left(e^{\left(\log_e^x\right)^2+1}\right)^{-1}+\left(e^{\left(6-\log_e^x\right)^2+1}\right)^{-1}}\right]dx$$

1) $\log_e^2$ 2) e^2 3) 2 4) 1

12. The area (in sq.units) of the region enclosed by the ellipse $x^2+3y^2=18$ in the first quadrant below the line y = x is

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

13. Let $f:R-\{0\}\to R$ be a function satisfying $f\left(\frac{x}{y}\right)=\frac{f(x)}{f(y)}$ for all x, y, $f(y)\neq 0$.

If $f'(1)=2024$ then

1) $xf'(x)+f(x)=2024$ 2) $xf'(x)-2023f(x)=0$

3) $xf'(x)+2024f(x)=0$ 4) $xf'(x)-2024f(x)=0$

14. Let $f:R\to R$ be a polynomial function of degree four having extreme values at x = 4 and x = 5. If $\lim_{x\to 0}\frac{f(x)}{x^2}=5$, then $f(2)=$

1) 10 2) 12 3) 8 4) 14

15. $\int e^x \left[\frac{x\sin^{-1}x}{\sqrt{1-x^2}} + \frac{\sin^{-1}x}{\left(1-x^2\right)^{3/2}} + \frac{x}{1-x^2} \right] dx = g(x) + c$ where c is constant of integration then $g\left(\frac{1}{2}\right) =$

1) $\frac{\pi}{6}\sqrt{\frac{e}{3}}$ 2) $\frac{\pi}{4}\sqrt{\frac{e}{2}}$ 3) $\frac{\pi}{4}\sqrt{\frac{e}{3}}$ 4) $\frac{\pi}{6}\sqrt{\frac{e}{2}}$

16. $\underset{x\to\frac{\pi}{2}}{Lt} \frac{\int_{x^3}^{\left(\frac{\pi}{2}\right)^3} \left[\sin\left(2t^{1/3}\right) + \cos\left(t^{1/3}\right)\right] dt}{\left(x-\frac{\pi}{2}\right)^2} =$

1) $\frac{3\pi^2}{2}$ 2) $\frac{9\pi^2}{8}$ 3) $\frac{11\pi^2}{10}$ 4) $\frac{5\pi^2}{9}$

17. The solution curve of differential equation $2y\frac{dy}{dx} + 3 = 5\frac{dy}{dx}$ passing through the point (0, 1) is a conic whose vertex lies on the line

1) $2x+3y=9$ 2) $2x+3y=-9$ 3) $2x+3y=6$ 4) $2x+3y=-6$

18. Let $f:[1,\infty)\to[2,\infty)$ be a differentiable function. If $10\int_1^x f(t)\,dt = 5xf(x) - x^5 - 9$ for all $x \geq 1$ then the value of $f(3)$ is

1) 22 2) 26 3) 18 4) 32

19. If the components of $\bar{a} = \alpha\bar{i} + \beta\bar{j} + \gamma\bar{k}$ along and perpendicular to $\vec{b} = 3\bar{i} + \bar{j} - \bar{k}$ respectively, are $\frac{16}{11}\left(3\bar{i} + \bar{j} - \bar{k}\right)$ and $\frac{1}{11}\left(-4\bar{i} - 5\bar{j} - 17\bar{k}\right)$ then $\alpha^2 + \beta^2 + \gamma^2 =$

1) 23 2) 16 3) 26 4) 18

20. If the image of the point (4, 4, 3) in the line $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z-1}{3}$ is (α,β,γ) then $\alpha+\beta+\gamma =$

1) 12 2) 8 3) 9 4) 7

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. Let $\bar{a}=\bar{i}+2\bar{j}+\bar{k}$, $\bar{b}=3\bar{i}-3\bar{j}+3\bar{k}$, $\bar{c}=2\bar{i}-\bar{j}+2\bar{k}$ and $\bar{d}$ be a vector such that $\bar{b}\times\bar{d}=\bar{c}\times\bar{d}$ and $\bar{a}.\bar{d}=4$ then $\left|\bar{a}\times\bar{d}\right|^2=$

22. If the shortest distance between the line $\frac{x+2}{2}=\frac{y+3}{3}=\frac{z-5}{4}$ and $\frac{x-3}{1}=\frac{y-2}{-3}=\frac{z+4}{2}$ is $\frac{38}{3\sqrt{5}}k$ and $\int_0^k\left[x^2\right]dx=\alpha-\sqrt{\alpha}$ where [.] is greatest integer function then $6\alpha^3=$

23. Let $\bar{c}$ be the projection vector of $\bar{b}=\lambda\bar{i}+4\bar{k}$, $\lambda>0$ on the vector $\bar{a}=\bar{i}+2\bar{j}+2\bar{k}$. If $\left|\bar{a}+\bar{c}\right|=7$ then the area of parallelogram formed by the vector $\bar{b}$ & $\bar{c}$ is

24. Let $f:R\to R$ be a function defined by $f(x)=\left||x+2|-2|x|\right|$. If m is number of point of local minima and n is number of points of local maxima of f, then m + n =

25. If $\lim\limits_{x\to0}\left(\frac{\tan x}{x}\right)^{\frac{1}{x^2}}=p$ then $96\log_e p=$ _____

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 parallel plate capacitor has plate area $40\ cm^2$ and plates separation 2 mm. The space between the plates is completely filled with a dielectric medium of a thickness 1 mm and dielectric constant 5. The capacitance of the system is:

1) $24\varepsilon_0 F$ 2) $\frac{3}{10}\varepsilon_0 F$ 3) $\frac{10}{3}\varepsilon_0 F$ 4) $10\varepsilon_0 F$

27. The correct relation between the degrees of freedom f and the ratio of specific heat γ is:

1) $f=\frac{2}{\gamma-1}$ 2) $f=\frac{2}{\gamma+1}$ 3) $f=\frac{\gamma+1}{2}$ 4) $f=\frac{1}{\gamma+1}$

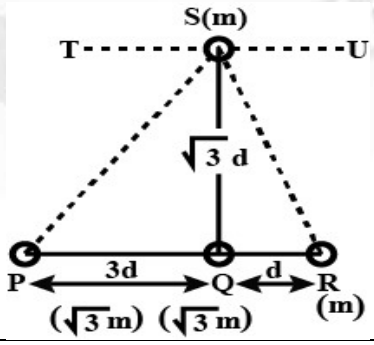
28. Let gravitation field in a space be given as E = -(k / r). If the reference point at distance d_i where potential is V_i then relation for potential is:

1) $V=k\,ln\frac{1}{V_i}+0$ 2) $V=k\,ln\frac{r}{d_i}+V_i$ 3) $V=ln\frac{r}{d_i}+kV_i$ 4) $V=ln\frac{r}{d_i}+\frac{V_i}{k}$

29. A single slit of width b is illuminated by coherent monochromatic light of wavelength λ. If the second and fourth minima in the diffraction pattern at a distance 1 m from the slit are at 3 cm and 6 cm, respectively from the central maximum, what is the width of the central maximum? (i.e. the distance between the first minimum on either side of the central maximum)

1) 6.0cm 2) 1.5cm 3) 4.5 cm 4) 3.0 cm

30. Three particles P, Q and R are placed as per given figure. Masses of P, Q and R are $\sqrt{3}m$, $\sqrt{3}m$ and m respectively. The gravitational force on a fourth 'S' of mass m is equal to



1) $\frac{\sqrt{3}Gm^2}{2d^2}$ in ST direction only

2) $\frac{\sqrt{3}Gm^2}{2d^2}$ in SQ direction $\frac{\sqrt{3}Gm^2}{2d^2}$ in SU direction

3) $\frac{\sqrt{3}Gm^2}{2d^2}$ in SQ direction only

4) $\frac{\sqrt{3}Gm^2}{2d^2}$ in SQ direction and $\frac{\sqrt{3}Gm^2}{2d^2}$ in ST direction

31. A convex lens is put 10 cm from a light source and it makes a sharp image on a screen, kept 10 cm from the lens. Now a glass block (refractive index 1.5) of 1.5 cm thickness is placed in contact with the light source. To get the sharp image again, the screen is shifted by a distance d. Then d is

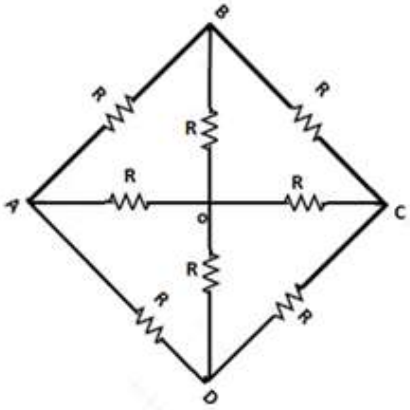
1) 0.55 cm towards the lens 2) 0

3) 1.1cm away from the lens 4) 0.55 cm away the lens

32. Light propagates with speed $2.2\times10^8 m/s$ and $2.4\times10^8 m/s$ in the medium P and Q respectively. The critical angle between them is

1) $\sin^{-1}\left(\frac{1}{11}\right)$ 2) $\sin^{-1}\left(\frac{11}{12}\right)$ 3) $\sin^{-1}\left(\frac{5}{12}\right)$ 4) $\sin^{-1}\left(\frac{5}{11}\right)$

33. In the network, each resistance is equal to R. The equivalent resistance between adjacent corners A and D is

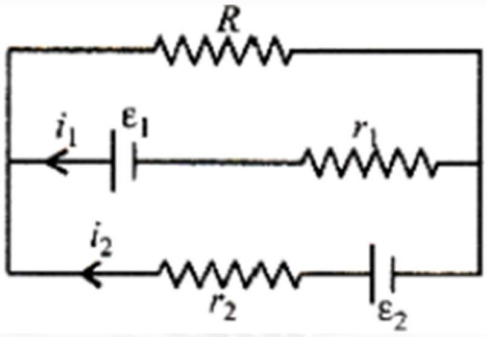


1)R 2) $\frac{2}{3}R$ 3) $\frac{3}{7}R$ 4) $\frac{8}{15}R$

34. A capacitor C is fully charged with voltage V_o after disconnecting the voltage source, it is connected in parallel with another uncharged capacitor of capacitance $\frac{C}{2}$. The energy loss in the process after the charge is distributed between the two capacitors is:

1) $\frac{1}{2}CV_0^2$ 2) $\frac{1}{3}CV_0^2$ 3) $\frac{1}{4}CV_0^2$ 4) $\frac{1}{6}CV_0^2$

35. See the electric circuit shown in the figure. Which of the following equations is a correct equation for it?



1) $\varepsilon_2 - i_2 r_2 - \varepsilon_1 - i_1 r_1 = 0$ 2) $-\varepsilon_2 - (i_1 + i_2)R + i_2 r_2 = 0$

3) $\varepsilon_1 - (i_1 + i_2)R + i_1 r_1 = 0$ 4) $\varepsilon_1 - (i_1 + i_2)R - i_1 r_1 = 0$

36. Two rods A and B of identical dimensions are at temperature $30^\circ C$. If A is heated up to $180^\circ C$ and B up to $T^\circ C$, Then the new lengths are the same, If the ratio of the coefficients of linear expansion of A and B is 4:3, then the value of T is:

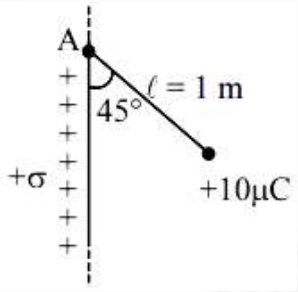
1) $230^\circ C$ 2) $270^\circ C$ 3) $200^\circ C$ 4) $250^\circ C$

37. A gas is compressed from a volume of $2m^3$ to a volume of $1m^3$ at a constant pressure of $100\,N/m^2$. Then it is heated at constant volume by supplying 150 J of energy. As a result, the internal energy of the gas:

1) increases by 250 J 2) decreases by 250 J

3) increases by 50 J 4) decreases by 50 J

38. A small bob of mass 100 mg and charge $+10\mu C$ is connected to an insulating string of length 1 m , it is brought near to an infinitely long nonconducting sheet of charge density 'σ' as shown in figure. If string subtends an angle of 45° with the sheet at equilibrium the charge density of sheet will be :



(Given, $\varepsilon_0 = 8.85\times10^{-12}\frac{F}{m}$ and acceleration due to gravity, $g = 10m/s^2$)

1) $0.855nC/m^2$ 2) $17.7nC/m^2$ 3) $885nC/m^2$ 4) $1.77nC/m^2$

39. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A): The radius vector from the sun to a planet sweeps out equal areas in equal intervals of time and thus areal velocity of planet is constant
Reason (R): For a central force field the angular momentum is a constant, In the light of the above statements, choose the most appropriate answer from the options given below:
1) Both (A) and (R) are correct and (R) is the correct explanation of (A)
2) Both (A) and (R) are correct and (R) is not the correct explanation of (A)
3) (A) is correct but (R) is not correct
4) (A) is not correct but (R) is correct

40. Given below are two statement: one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A): The outer body of an air craft is made of metal which protects persons sitting inside from lightning-strikes.
Reason (R): The electric field inside the cavity enclosed by a conductor is zero. In the light of the above statements, chose the appropriate answer from the options given below:
1) Both (A) and (R)are correct and (R) is the correct explanation of (A)
2) (A) is correct but (R) is not correct
3) Both (A) and (R) are correct but (R) is not correct explanation of (A)
4) (A) is not correct but (R) is correct

41. Match List –I with List-II.

List-I	List-II
1) Heat capacity of body	I) Jkg^{-1}
2) Specific heat capacity of body	II) JK^{-1}
3) Latent heat	III) $Jkg^{-1}K^{-1}$
4) Thermal conductivity	IV) $Jm^{-1}K^{-1}s^{-1}$

1) A – III, B – I, C – II, D – IV 2) A – IV, B – III, C – II, D – I

3) A – III, B – IV, C – I, D – II 4) A – II, B – III, C – I, D – IV

42. Read the following statements carefully.

Y: The resistivity of a semiconductor decreases with increase of temperature.

Z: In a conducing solid, the rate of collisions between free electrons and ions Increases with increase of temperature

Select the correct statement(s) from the following

1) Y is true but Z is false 2) Y is false but Z is true

3) Both Y and Z are true 4) Y is true and Z is the correct reason for Y

43. Statement 1: When light passes from air into glass, its wavelength decreases.

Statement 2: The frequency of light increases as it enters a denser medium.

1) Statement-1 is true, Statement-2 is true; Statement-2 is the correct explanation of Statement-1,

2) Statement-1 is true; Statement-2 is true; Statement-2 is not the correct explanation of Statement-1.

3) Statement-1 is true; Statement-2 is false.

4) Statemetn-1 is false; Statement-2 is true.

44. Capacitors C, 2C and 3C are connected as follows: C and 2C are connected in parallel, and that combination is then connected in series with 3C. The equivalent capacitance C_{eq} (in terms of C) is:

1) $\frac{3}{4}C$ 2) $\frac{3}{2}C$ 3) $\frac{9}{5}C$ 4) 2C

45. Two rods of equal length L and cross-sectional area A are joined in series. Rod 1 has thermal conductivity $k_1 = 200 W\,m^{-1}K^{-1}$ and is attached to a hot reservoir at $100^\circ C$. Rod 2 has $k_2 = 50 W\,m^{-1}K^{-1}$ and is attached to a cold reservoir at $0^\circ C$. In Steady state, the temperature at the junction is:

1) $60^\circ C$ 2) $80^\circ C$ 3) $50^\circ C$ 4) $20^\circ C$

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. Initially a gas of diatomic molecules is contained in a cylinder of volume V_1 at a pressure P_1 and temperature 250K. Assuming that 25% of the molecules get dissociated causing a change in number of moles. The pressure of the resulting gas temperature 2000K, when contained in a volume $2V_1$ is given by P_2. The ratio P_2 / P_1 is _____

47. The series combination of two batteries, both of the same emf 10V, but different internal resistance of 20 Ω and 5Ω, is connected to the parallel combination of two resistors 30 Ω and R Ω The voltage difference across the battery of internal resistance 20Ω is zero, the value of R (in Ω) is_____.

48. Two capacitors $C_1 = 6\mu F$ and $C_2 = 3\mu F$ are connected in series across 12V. Find the energy (in μJ) stored in C_1

49. A wire has resistance $R_0 = 12\ \Omega$ length L, and uniform cross-section A it is drawn so that its length doubles to 2L (assume volume remains constant).Find the new resistance (In Ω)

50. An ideal gas goes from (P_1, V_1) to $(P_2, 2V_1)$ following PV^2 = constant. If $P_1 = 8.0 \times 10^4$ Pa and $V_1 = 2.0 \times 10^{-2} m^3$, find the work done (in J)

CHEMISTRY

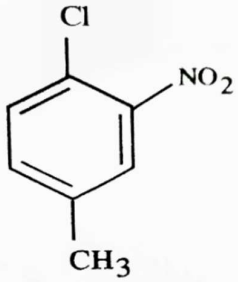
Max Marks: 100

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. The IUPAC name for



1) 1-chloro-2-nitro-4-methyl benzene
2) 1-chloro-4-Methyl-2-Nitro benzene
3) 2-chloro-1-nitro-5-methyl benzene
4) m-nitro-*p*-chlorotoluene

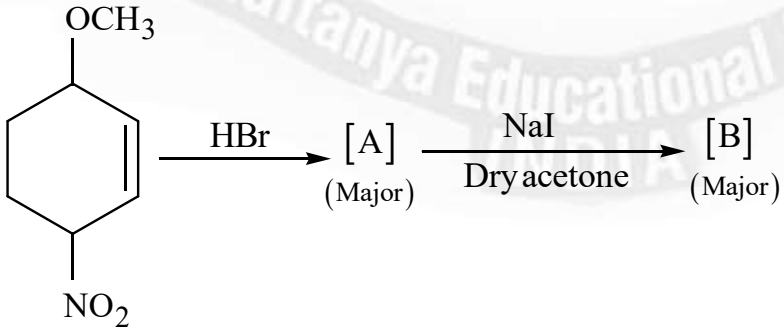
52. Which of the following reactions of methane is incomplete combustion?

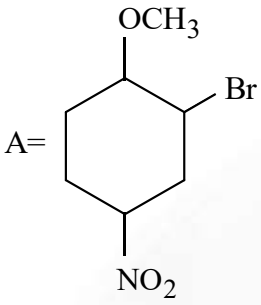
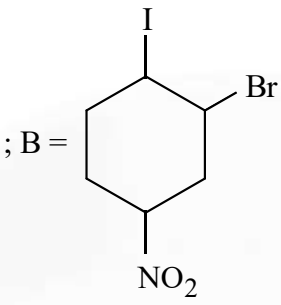
1) $2CH_4 + O_2 \xrightarrow{Cu/523/100\ atm} 2CH_3OH$
2) $CH_4 + O_2 \xrightarrow{Mo_2O_3} HCHO + H_2O$
3) $CH_4 + O_2 \rightarrow C_{(S)} + 2H_2O(l)$
4) $CH_4 + 2O_2 \rightarrow CO_2(g) + 2H_2O(l)$

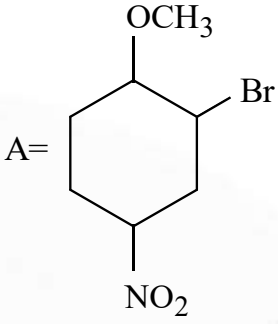
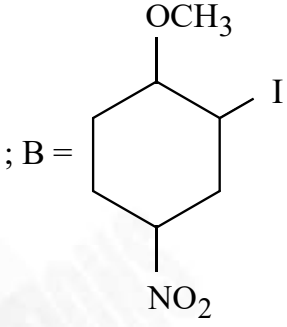
53. During hearing of a court case, the judge suspected that some changes in the documents had been carried out. He asked the forensic department to check the ink used at two different places. According to your which technique can give the best results?

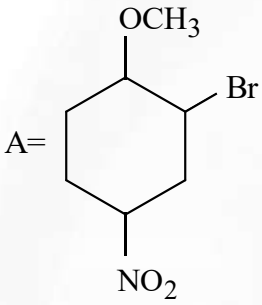
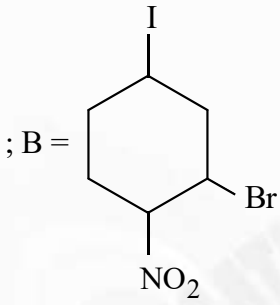
1) Column chromatography 2) Solvent extraction
3) Distillation 4) Thin layer chromatography

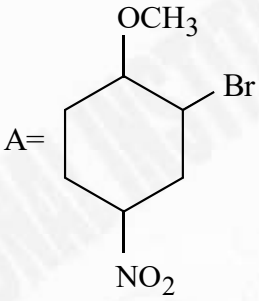
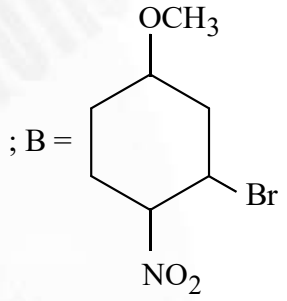
54. Identify A and B in the chemical reaction.



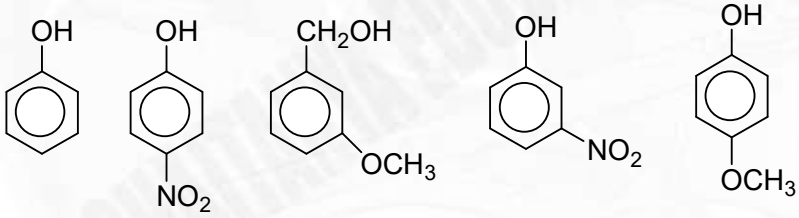
1) A=  ; B = 

2) A=  ; B = 

3) A=  ; B = 

4) A=  ; B = 

55. Mark the correct order of decreasing acid strength of the following compounds.



(I) (II) (III) (IV) (V)

1) V > IV > II > I > III
2) II > IV > I > V >III
3) IV>V>III>II>I
4) V>IV>III>II>I

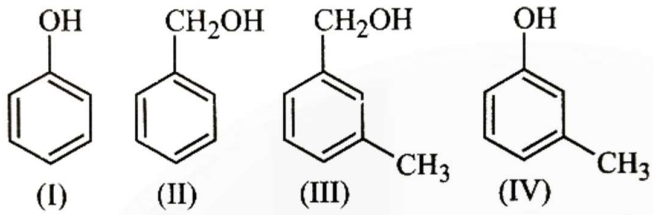
56. Assertion (A): The compound tetraene has the following structural formula.

It is cyclic and has conjugated 8π-electron system but it is not an aromatic compound.

Reason (R): (4n+2) π electrons rule does not hold because and ring is not planar.

1) Both A and R are correct and R is the correct explanation of A
2) Both A and R are correct but R is not the correct explanation of A
3) Both A and R are not correct
4) A is not correct but R is correct

57. Which of the following compounds is aromatic alcohol?



1) I, II, III, IV 2) I, IV 3) II, III 4) I

58. Match the common names given in column I with the IUPAC names given in Column II.

Column I (Common names)	Column II (IUPAC names)
A. Cinnamaldehyde	1. Pentanal
B. Acetophenone	2. Prop-2-en-al
C. Valeraldehyde	3. 4-methylpent-3-en-2-one
D. Acrolein	4. 3-phenylprop-2-en-al
E. Mesityl oxide	5. 1-phenylethanone

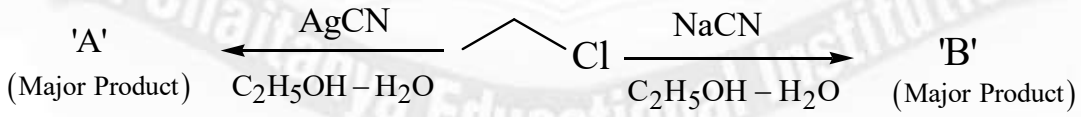
1) $A \to 4, B \to 5, C \to 2, D \to 1, E \to 3$ 2) $A \to 4, B \to 5, C \to 1, D \to 3, E \to 2$

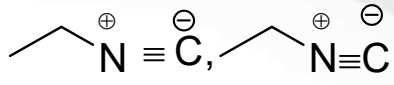
3) $A \to 4, B \to 5, C \to 1, D \to 2, E \to 3$ 4) $A \to 5, B \to 4, C \to 1, D \to 2, E \to 3$

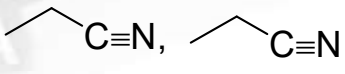
59. Assertion (A): N-ethylbenzene sulphonamide is soluble in alkali.
Reason (R): Hydrogen attached to nitrogen in sulphonamide is strongly acidic.
1) Both A and R are correct and R is the correct explanation of A
2) Both A and R are correct but R is not the correct explanation of A
3) Both A and R are not correct 4)A is not correct but R is correct

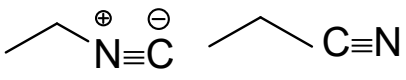
60. Which of the following bases is not present in DNA ?
1) adenine (A) 2) Thymine 3) Cytosine 4) Uracil

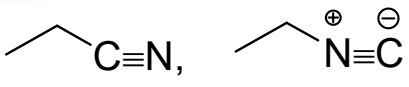
61. Considering the below reactions, the compound 'A' and compound 'B', respectively are:



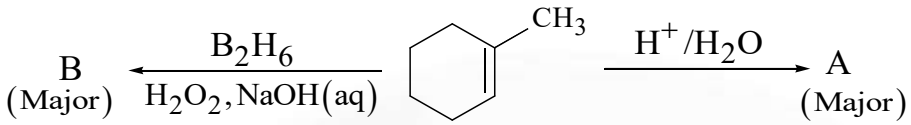
1) 

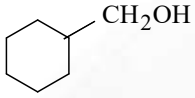
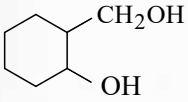
2) 

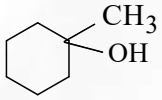
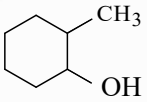
3) 

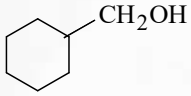
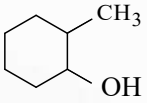
4) 

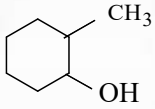
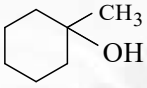
62. Product A and B formed in the following set of reaction are:



1) A=  B= 

2) A=  B= 

3) A=  B= 

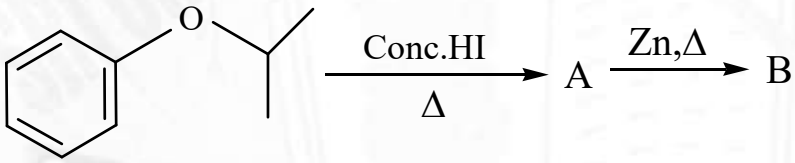
4) A=  B= 

63. The increasing order of pK_a for the following phenols is

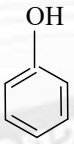
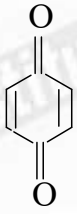
1) 2,4-Dinitrophenol 2) 4-Nitro phenol
3) 2,4,5- Trimethylphenol 4) phenol 5) 3-Chlorophenol

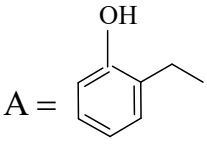
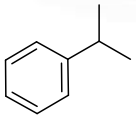
1)1,5,4,3,2 2)3,4,5,2,1 3)1,2,5,4,3 4) 3,5,4,2,1

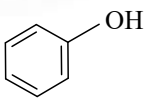
64. Compound I is heated with conc. HI to give a hydroxyl compound A which is further heated with Zn dust to give compound B. Identify A and B



1) A =  ,B = 

2) A =  ,B = 

3) A =  ,B = 

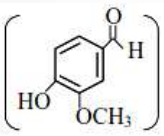
4) A =  ,B = 

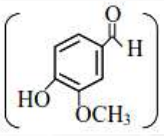
65. Number of molecules from below which cannot give iodoform reaction is:

Ethanol, Isopropyl alcohol, Bromoacetone, 2-Butanol, 2-Butanone, Butanal, 2-Pentanone, 3-Pentanone, Pentanal and 3-Pentanol

1) 5 2) 4 3) 3 4) 2

66. Given below are two statement:

Statement(I) : Vanillin  Will react with NaOH and also with Tolle n's reagent.

Statement(II) : Vanillin 

Will undergo self-aldol condensation very easily.

In the light of the above statements, choose the Most appropriate answer from the options Given below:

1)Statement I is incorrect but statement II is correct
2)Statement is correct but Statement II is incorrect
3) Both Statement I and Statement II are incorrect
4)Both Statement I and Statement II are correct

67. Given below are two statements;

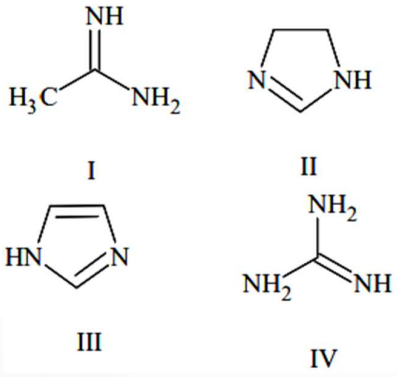
Statement-I: Ethyl pent-4-yn-oate on reaction with CH_3 MgBr gives a 3^o-alcohol.

Statement-II: In this reaction, one mole of ethyl pent-4-yn-oate utilizes two moles of $CH_3\,MgBr$.

In the light of the above statements, choose the most appropriate answer, From the options given below

1) Both Statement-I and Statement-II are false
2) Statement-I is false but Statement-II is true
3) Statement-I is true but Statement-II is false
4) Both Statement-I and Statement-II are true

68. The order of basicity among the following compounds is



I II III IV

1) II>I>IV>III 2) I>IV>III>II 3) IV>II>III>I 4) IV>I>II>III

69. HBr reacts with $H_2C = CH - OCH_3$ under anhydrous conditions at 25^0C to give

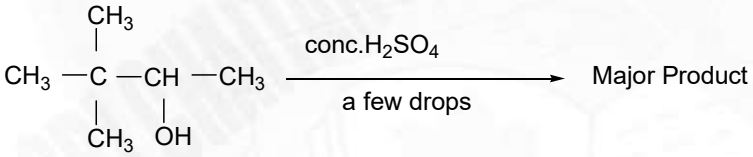
1) $H_3C - \underset{\displaystyle Br}{\underset{|}{CH}} - OCH_3$

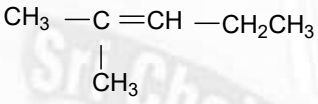
2) $CH_3 - CHO$ and CH_3Br

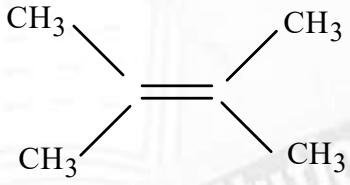
3) $\underset{\displaystyle Br}{\underset{|}{CH_2}} - CHO$ and $CH_3 - OH$

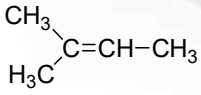
4) $CH_2 - CH_2 - OCH_3$ with $\underset{\displaystyle Br}{\underset{|}{\ }}$

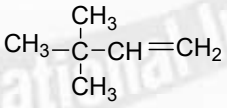
70. The major product formed in the following reaction is



1) 

2) 

3) 

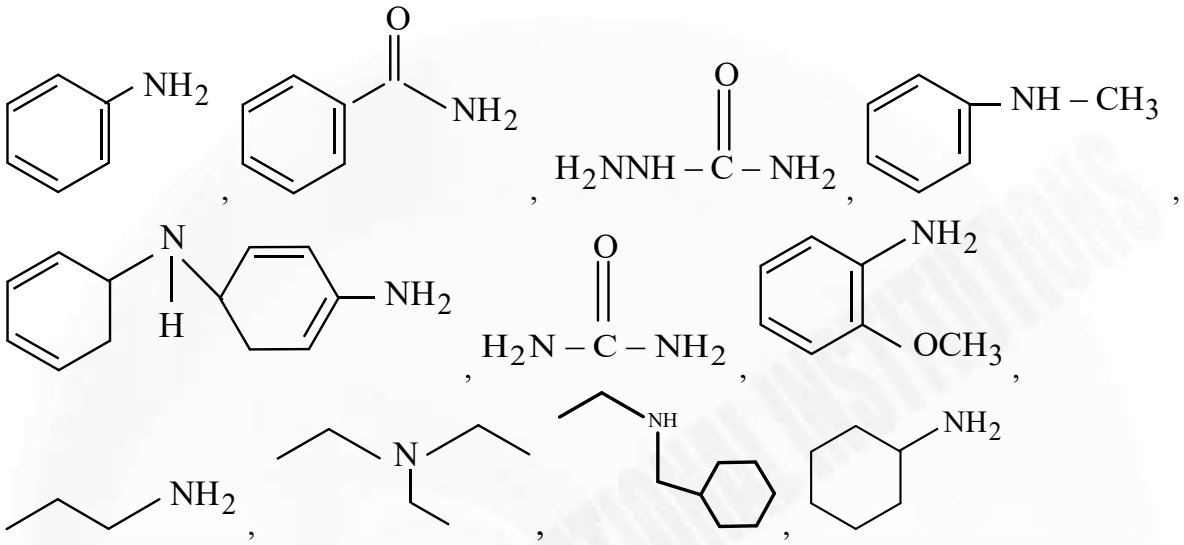
4) 

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).**

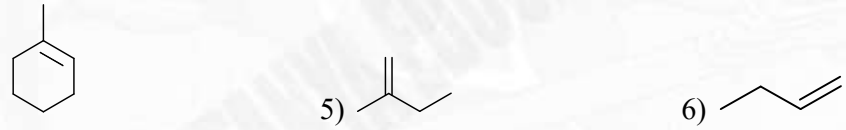
Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases

71. Number of amine compounds from the following giving solids which are soluble in NaOH upon reaction with Heinsberg's reagent



72. How many of the following compounds will produce CO_2 on oxidative ozonolysis.

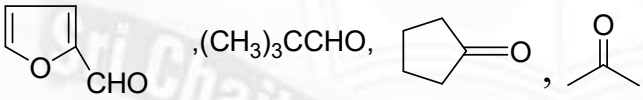
1) $Me-C\equiv C-Me$ 2) $ph-CH=CH_2$ 3) $H_3C-C\equiv CH$



73. How many products are obtained on Photolytic di chlorination of Isobutane (Excluding stereo isomers)

74. Find out number of substances which can undergo cannizzaro's reaction.

$$C_2H_5CHO, C_6H_5CHO, C_6H_5COCOC_6H_5, C_6H_5COCHO, CH_3COOCH_3$$



75. $R-CH_2-OH \xrightarrow{?} R-CH_2-Cl$

Find out number of reagents that can be used for above conversion, from following.

PCl_3, PCl_5, $POCl_3$, $SOCl_2$, NaCl

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TOSHNIWAL SHIVEN
APP. NO. 250310391420
DLP/AITS STUDENT

SAKSHAM JINDAL
APP. NO. 250310236596
DLP/AITS STUDENT

BELOW 100 — 31 ALL INDIA OPEN CATEGORY RANKS	BELOW 500 — 95 ALL INDIA OPEN CATEGORY RANKS	BELOW 10 — 10 ALL INDIA CATEGORY RANKS COUNT	BELOW 100 — 98 ALL INDIA CATEGORY RANKS COUNT	BELOW 1000 — 579 ALL INDIA CATEGORY RANKS COUNT

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

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

MAJID MUJAHID HUSAIN
H.T.No. 251134112*

UJJWAL KESARI
H.T.No. 252016104*

AKSHAT KUMAR CHAURASIA
H.T.No. 254065055*

BELOW 100 ALL INDIA OPEN CATEGORY RANKS	BELOW 500 ALL INDIA OPEN CATEGORY RANKS	BELOW 1000 ALL INDIA OPEN CATEGORY RANKS	BELOW 1000 ALL INDIA CATEGORY RANKS COUNT	NUMBER OF QUALIFIED RANKS
29	113	205	745	4,212

*DLP/AITS