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 **Paper -2(Adv-2022-P2-Model)** **Date: 14-09-2025**

Time: 02.00Pm to 05.00Pm **CTA-03** **Max. Marks: 180**

14-09-2025_Sr.Super60_STERLING-BT_Jee-Adv(2022-P2)_CTA-03_Syllabus

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

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

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

Name of the Student: _____ **H.T. NO:** | | | | | | | |

JEE-ADVANCED-2022-P2-Model

Time:3Hr's **IMPORTANT INSTRUCTIONS** **Max Marks: 180**

MATHEMATICS:

Section	Question Type	+Ve Marks	- Ve Marks	No.of Qs	Total marks
Sec – I(Q.N : 1 – 8)	Questions with Integer Answer Type%	+3	-1	8	24
Sec – II(Q.N : 9 – 14)	Questions with Multiple Correct Choice with partial mark	+4	-2	6	24
Sec – III(Q.N : 15 – 18)	Questions with Single Correct Choice	+3	-1	4	12
Total				**18**	**60**

PHYSICS:

Section	Question Type	+Ve Marks	- Ve Marks	No.of Qs	Total marks
Sec – I(Q.N : 19 – 26)	Questions with Integer Answer Type	+3	-1	8	24
Sec – II(Q.N : 27 – 32)	Questions with Multiple Correct Choice with partial mark	+4	-2	6	24
Sec – III(Q.N : 33 – 36)	Questions with Single Correct Choice	+3	-1	4	12
Total				**18**	**60**

CHEMISTRY:

Section	Question Type	+Ve Marks	- Ve Marks	No.of Qs	Total marks
Sec – I(Q.N : 37 – 44	Questions with Integer Answer Type	+3	-1	8	24
Sec – II(Q.N : 45 – 50)	Questions with Multiple Correct Choice with partial mark	+4	-2	6	24
Sec – III(Q.N : 51 – 54)	Questions with Single Correct Choice	+3	-1	4	12
Total				**18**	**60**

MATHEMATICS **Max Marks: 60**

SECTION-I
(INTEGER ANSWER TYPE)

- This section contains EIGHT (08) questions.
- The answer to each question is a SINGLE DIGIT INTEGER ranging from 0 TO 9, BOTH INCLUSIVE.
- For each question, enter the correct integer corresponding to the answer using the mouse and the on-screen virtual Numeric keypad in the place designated to enter the answer.
- Answer to each question will be evaluated **according to the following marking scheme**:

Full Marks: +3 If ONLY the correct integer is entered;
Zero Marks: 0 If the question is unanswered;
Negative Marks: -1 In all other cases

1. Let 'R' denote the set of all real numbers. Let $f:R\to R$ be a function such that $f(x)>0\ \forall x\in R$ and $f(x+y)=f(x)f(y)\ \forall x, y\in R$ let the real numbers $a_1, a_2.....,a_{50}$ be in an arithmetic progression. If $f(a_{31})=64\,f(a_{25})$, $\sum_{i=1}^{50} f(a_i)=3\left(2^{25}+1\right)$, and $\sum_{i=6}^{30} f(a_i)=$ 48k. Then k = ...

2. $f(x)=\{x\}+\{x+1\}+\{x+2\}+.....\{x+99\}$

   Then $\frac{1}{41}\left[f\left(\sqrt{2}\right)\right]$ = ... where { } denotes fractional part function and [ ] denotes greatest integer function

3. If $\lim\limits_{x\to 0}\frac{1-\sqrt{\cos 2x}.\sqrt[3]{\cos 3x}.\sqrt[4]{\cos 4x}.....\sqrt[n]{\cos nx}}{x^2}$ has the value equal to 10. Then the value of 'n' is .....

4. If the function $f(x)=-4e^{\frac{1-x}{2}}+1+x+\frac{x^2}{2}+\frac{x^3}{3}$ and $g(x)=f^{-1}(x)$ then the reciprocal of $g'\left(-\frac{7}{6}\right)$ is .....

5. Consider $f(x)=\frac{1}{1+|x|}+\frac{1}{1+|x-1|}$. Let x_1 and x_2 be points where f(x) attains local minima and global maxima respectively if $k=f(x_1)+f(x_2)$, then 6k – 9 =

6. Let $y=f(x)=4x^3+2x-6$, then the value of $\int_0^2 f(x)\,dx+\int_0^{30} f^{-1}(y)\,dy$ is 14k.

   Then k =_____

7. The area (in sq. units) of the region enclosed between the curves $x = y^2 - 1$ and $x = |y|\sqrt{1-y^2}$ is …….

8. For all $x > 0$ let $y_1(x), y_2(x)$ and $y_3(x)$ be the functions satisfying

$$\frac{dy_1}{dx} - (\sin x)^2 y_1 = 0,\ y_1(1) = 5\ ,$$

$$\frac{dy_2}{dx} - (\cos x)^2 y_2 = 0,\ y_2(1) = \frac{1}{3}\ ,$$

$$\frac{dy_3}{dx} - \left(\frac{2-x^3}{x^3}\right) y_3 = 0,\ y_3(1) = \frac{3}{5e}\ ,$$

Respectively then $\lim\limits_{x\to 0^+} \dfrac{y_1(x).y_2(x).y_3(x) + 2x}{e^{3x}\sin x} =$

SECTION – II
(ONE OR MORE CORRECT ANSWER TYPE)

•This section contains SIX (06) questions.
•Each question has FOUR options. **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
•For each question, choose the option(s) corresponding to (all) the correct answer(s).
•Answer to each question will be evaluated **according to the following marking scheme**:
Full Marks: +4 If only (all) the correct option(s) is(are) chosen; *Partial Marks* +3 If all the four options are correct but ONLY three options are chosen;
Partial Marks: +2 If three or more options are correct but ONLY two options are chosen, both of which are correct;
Partial Marks: +1 If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks: 0 If none of the options is chosen (i.e. the question is unanswered);
Negative Marks: -2 In all other cases.

9. A curve passes through (2, 0) and the slope of tangent at P(x, y) equals $\dfrac{(x+1)^2 + y - 3}{x+1}$ then

A) Curve is $y = x^2 - 2x$ B) Curve is $y = x^3 - 8$

C) Area bounded by the curve and x-axis in fourth quadrant is $\frac{2}{3}$ square units

D) Area bounded by the curve and x-axis in fourth quadrant is $\frac{4}{3}$ square units

10. If $u = \int_0^\infty \dfrac{dx}{x^4 + 7x^2 + 1}$ and $v = \int_0^\infty \dfrac{x^2 dx}{x^4 + 7x^2 + 1}$, then

A) $u > v$ B) $u < v$ C) $u = v$ D) $u = \dfrac{\pi}{6}$

11. If y(x) satisfies the differential equation $\frac{dy}{dx}+(2\tan x)y=\sin x$ and $y\left(\frac{\pi}{3}\right)=0$, then which of the following statement(s) is/are correct?

A) $y'\left(\frac{\pi}{6}\right)=\frac{2\sqrt{3}-1}{2}$ B) $y(\pi)=-3$

C) Number of values of 'x' for which $y(x)=-1$ in $(0, 2\pi)$ are three

D) $\int_0^{\frac{\pi}{2}} y(x)\,dx=1-\frac{\pi}{2}$

12. If a function 'f' satisfies the relation $f(x)f''(x)-f(x)f'(x)=(f'(x))^2\ \forall x\in R$ and $f(0)=f'(0)=1$, then identify which of the following statements is/are correct?

A) Equation $f(x)=e^x$ has four solutions

B) Equation $f(x)=e^x$ has exactly one solution

C) $\lim_{x\to-\infty} f(x)=\frac{1}{e}$ D) $\lim_{x\to0}\frac{f(x)-1}{x}=1$

13. $f(x)=x^2-2ax+a(a+1)$, $f:[a,\infty)\to[a,\infty)$. If one of the solutions of the equation $f(x)=f^{-1}(x)$ is 5049, then the other may be :

A) 5051 B) 5048 C) 5052 D) 5050

14. Which of the following statement(s) is/are correct?

A) Equation $\text{sgn}(x)=\sin^{-1}x$ has one solution

B) Equation $\left|x^2-4|x|+3\right|=1$ has six solutions

C) If α is solution of equation $\log_{10}x^2-\log_{10}(-x)=4$ then $\text{sgn}(\alpha)=-1$

D) Equation $(\sin^{-1}x)^3+(\cos^{-1}x)^3+(\tan^{-1}x)^3=3\sin^{-1}x\cos^{-1}x.\tan^{-1}x$ has no solution

SECTION – III
(SINGLE CORRECT ANSWER TYPE)

This section contains **FOUR (04)** questions.

- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated according to the following marking scheme:

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

15. For any $y \in R$ let $\cot^{-1} y \in (0, \pi)$ and $\tan^{-1} y \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, then the sum of the solutions of the equation $\tan^{-1}\left(\frac{6y}{9-y^2}\right) + \cot^{-1}\left[\frac{9-y^2}{6y}\right] = \frac{2\pi}{3}$ for $0 < |y| < 3$ is equal to ….

A) $2\sqrt{3}-3$ B) $3-2\sqrt{3}$ C) $4\sqrt{3}-6$ D) $6-4\sqrt{3}$

16. The area (in sq. units) of the region $\left\{(x, y): 0 \le x \le \frac{9}{4}, 0 \le y \le 1, x \ge 3y, x + y \ge 2\right\}$ is

A) $\frac{11}{32}$ B) $\frac{35}{96}$ C) $\frac{37}{96}$ D) $\frac{13}{32}$

17. The minimum value of $(x_1 - x_2)^2 + \left(\frac{x_1^2}{20} - \sqrt{(17-x_2)(x_2-13)}\right)^2$ $x_1 \in R^+$ and $x_2 \in (13, 17)$ is

A) $5\sqrt{2}$ B) $5\sqrt{2}-2$ C) $5\sqrt{2}+2$ D) $54-20\sqrt{2}$

18. $\lim\limits_{x \to 0^+} \dfrac{-1+\sqrt{(\tan x - \sin x)+\sqrt{(\tan x - \sin x)+\sqrt{(\tan x - \sin x)+.....\infty}}}}{-1+\sqrt{x^3+\sqrt{x^3+\sqrt{x^3+.....\infty}}}}$

A) 0 B) $\frac{1}{2}$ C) $-\frac{1}{2}$ D) 1

PHYSICS **Max Marks: 60**

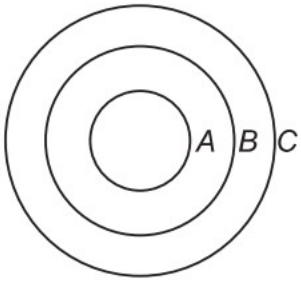
SECTION-I
(INTEGER ANSWER TYPE)

- This section contains EIGHT (08) questions.
- The answer to each question is a SINGLE DIGIT INTEGER ranging from 0 TO 9, BOTH INCLUSIVE.
- For each question, enter the correct integer corresponding to the answer using the mouse and the on-screen virtual Numeric keypad in the place designated to enter the answer.
- Answer to each question will be evaluated **according to the following marking scheme**:

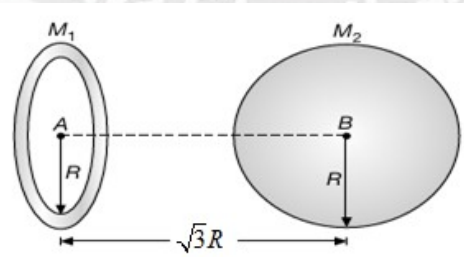
Full Marks: +3 If ONLY the correct integer is entered;
Zero Marks: 0 If the question is unanswered;
Negative Marks: -1 In all other cases

19. Two identical thin rings, each of radius R, are coaxially placed a distance R apart. If Q_1 and Q_2 are respectively the charges uniformly spread on the two rings, the work done in moving a charge 'q' from the centre of one ring to that of the other is $\frac{q(Q_1 - Q_2)(\sqrt{2}-1)}{\sqrt{x}(4\pi\varepsilon_0 R)}$. The value of 'x' is

20. Charge Q, 2Q and –Q are given to three concentric conducting spherical shells A, B and C respectively as shown in fig. The ratio of charges on the inner and outer surfaces of shell 'C' will be $\frac{-x}{2}$. The value of 'x' is

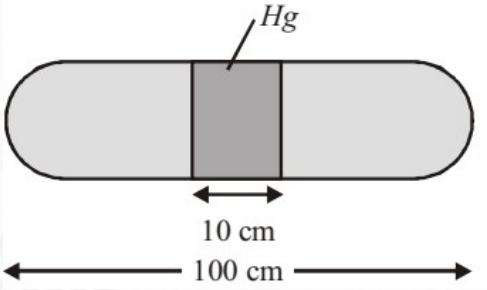


21. Figure shows a ring of mass M_1 and a sphere of mass M_2 separated by a distance $\sqrt{3}R$. A small object of mass 'm' is displaced from A to B. The work done by gravitational forces is $\Rightarrow W_g = \frac{GM}{x\,R}(y\,M_2 - M_1)$. Then x + y

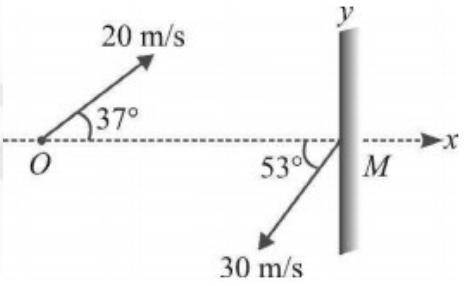


22. A gaseous mixture enclosed in a vessel consists of one gm mole of a gas A with ($\gamma = 5/3$) and another *B* with ($\gamma = 7/5$) at a temperature *T*. The gases *A* and *B* do not react with each other and assumed to be ideal. The number of gm moles of the gas B if γ of the gaseous mixture is 19/13 is

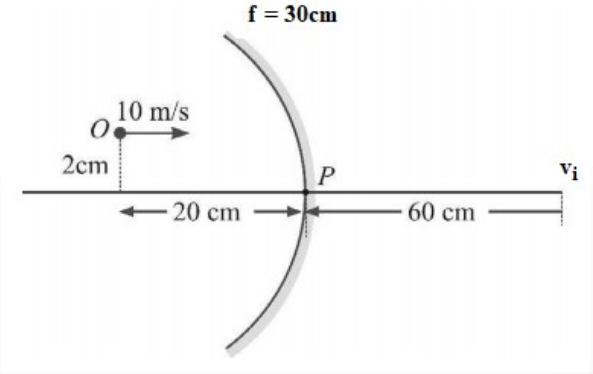
23. A horizontal uniform glass tube of 100 cm, length sealed at both ends contain 10 cm mercury column in the middle. The temperature and pressure of air on either side of mercury column are respectively 81^0C and 76 cm of mercury. If the air column at one end is kept at 0^0C and the other end at 273 ^{0}C, the pressure of air which is at 0^0C is 100x. (in cm of *Hg*). The value of ' x ' is (near integer)



24. An object *O* and mirror *M* are moving with the velocities shown in the figure. The velocity of the image of the object in the mirror with respective to ground is $\left(-x\hat{i}+y\hat{j}\right)$m / s. Then the value of $\sqrt{x+y}$



25. A point object is moving towards and parallel to principal axis of a concave mirror of focal length 30 cm at a distance of 2 cm from principal axis of the mirror. Velocity of its image when object is at a distance of 20 cm from the mirror is $-10x\hat{i}-6\hat{j}$. Then the value of 'x' is



26. A light massless rod of length ℓ lies in $x-y$ plane with its centre at origin and it makes an angle θ with x-axis. A particle of mass m and charge $-q$ is attached at its left end and another particle of mass m and charge q at the other end. Now an electric field of constant magnitude E and directed along x-axis is switched on. The angular speed of the rod at the instant when it becomes parallel to x-axis is $\omega=\sqrt{\frac{NqE(1-\cos\theta)}{m\ell}}$. Then value of 'N' is

SECTION – II
(ONE OR MORE CORRECT ANSWER TYPE)

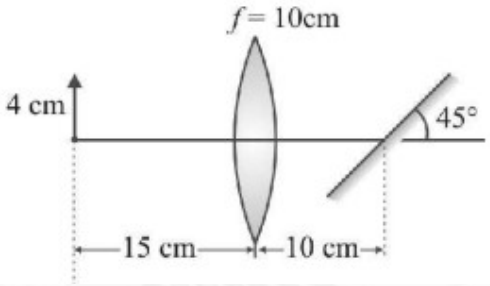
•This section contains SIX (06) questions.
•Each question has FOUR options. **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
•For each question, choose the option(s) corresponding to (all) the correct answer(s).
•Answer to each question will be evaluated **according to the following marking scheme**:
Full Marks: +4 If only (all) the correct option(s) is(are) chosen; *Partial Marks* +3 If all the four options are correct but ONLY three options are chosen;
Partial Marks: +2 If three or more options are correct but ONLY two options are chosen, both of which are correct;
Partial Marks: +1 If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks: 0 If none of the options is chosen (i.e. the question is unanswered);
Negative Marks: -2 In all other cases.

27. Consider a planet moving in an elliptical orbit round the sun. The work done on the planet by the gravitational force of the sun
A) is zero in any small part of the orbit
B) is zero in some parts of the orbit
C) is zero in one complete revolution
D) is zero in no part of the motion

28. A particle of mass 2 kg and charge 1 mC is projected vertically with a velocity 10 ms^{-1}. There is a uniform horizontal electric field of 10^4 N / C, then
A) the horizontal range of the particle is 10 m
B) the time of flight of the particle is 2s
C) the maximum height reached is 5m
D) the horizontal range of the particle is 5m

29. Mark the correct options.
A) Gauss's law is valid only for uniform charge distributions
B) Gauss's law is valid only for charges placed in vacuum
C) The electric field calculated by Gauss's law is the field due to all the charges
D) The flux of the electric field through a closed surface due to all the charges is equal to the flux due to the charges enclosed by the surface.

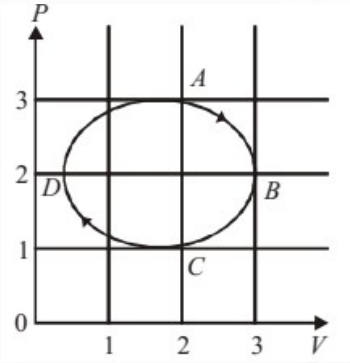
30. An object of height 4 cm is kept to the left of and on the axis of a converging lens of focal length 10 cm as shown in *fig.* A plane mirror is placed inclined at 45^0 to the lens axis 10 cm to the right of the lens.



A) Height of the image 8 cm perpendicular to principle axes of the lens
B) Height of the image 12 cm perpendicular to principle axes of the lens
C) Distance of image is 30 cm from the pole of the lens along the principle axes of the lens
D) Distance of image is 60 cm from the pole of the lens along the principle axes of the lens

31. A ball of radius R carries a positive charge whose volume density depends on a separation 'r' from the ball's centre as $\rho = \rho_0\left(1-\frac{r}{R}\right)$, when ρ_0 is a constant. Assuming the permittivities of the ball and the environment is equal to unity
A) the magnitude of the electric field strength as a function of the distance 'r' inside the ball $\Rightarrow E = \frac{4\pi\rho_0}{4\pi\varepsilon_0 r^2}\left(\frac{r^3}{3}-\frac{r^4}{4R}\right)$
B) the magnitude of the electric field strength as a function of the distance 'r' inside the ball $\Rightarrow E = \frac{8\pi\rho_0}{4\pi\varepsilon_0 r^2}\left(\frac{r^3}{3}-\frac{r^4}{4R}\right)$
C) the magnitude of the electric field strength as a function of the distance 'r' outside the ball $\Rightarrow E = \frac{\rho_0 R^3}{12\varepsilon_0 r^2}$
D) the magnitude of the electric field strength as a function of the distance 'r' outside the ball $\Rightarrow E = \frac{\rho_0 R^3}{6\varepsilon_0 r^2}$

32. The fig. shows the P-V plot of an ideal gas taken through a cycle ABCDA. The part ABC is a semi-circle and CDA is half of an ellipse. Then :



A) The process during the path $A \rightarrow B$ is isothermal

B) Heat flows out of the gas during the path $B \rightarrow C \rightarrow D$

C) Work done during the path $A \rightarrow B \rightarrow C$ is zero

D) Positive work is done by the gas in the cycle ABCDA

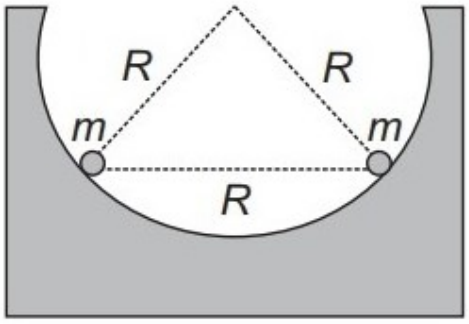
SECTION – III
(SINGLE CORRECT ANSWER TYPE)

This section contains **FOUR (04)** questions.

- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated <u>according to the following marking scheme:</u>

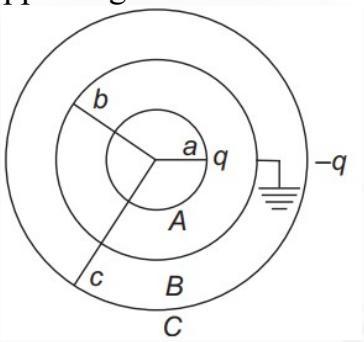
Full Marks : +3 If **ONLY** the correct option is chosen;
Zero Marks : 0 If none of the options is chosen (i.e. the question is unanswered);
Negative Marks : −1 In all other cases

33. Two identical beads each have a mass 'm' and charge 'q'. When placed in a hemispherical bowl of radius R with frictionless, non-conducting walls, the beads move, and at equilibrium they are a distance R apart (fig.) Determine the charge on each bead.



A) $\left(\frac{4\pi\varepsilon_0 mgR^2}{\sqrt{3}}\right)^{1/2}$ B) $\left(\frac{4\pi\varepsilon_0 mgR^2}{\sqrt{3}}\right)^{1/3}$ C) $\left(\frac{5\pi\varepsilon_0 mgR^2}{\sqrt{5}}\right)^{1/3}$ D) $\left(\frac{\pi\varepsilon_0 mgR^2}{\sqrt{5}}\right)^{1/3}$

34. Fig. shows three concentric thin spherical shells A, B and C of radii a, b and c respectively. The shells A and C are given charges q and –q respectively and the shell B is earthed. Find the charges appearing on the surfaces of B and C



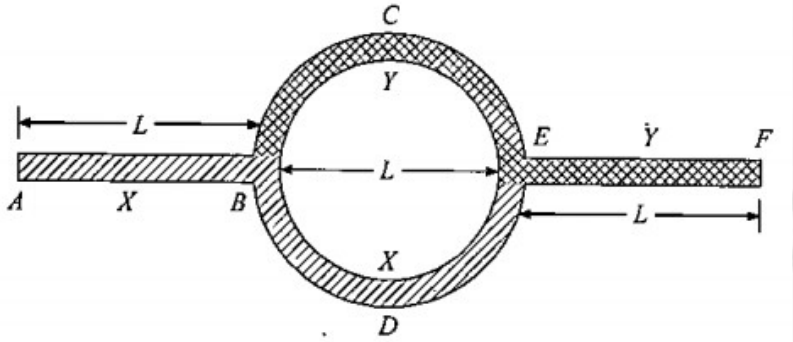
A) Outer surface of $B \rightarrow \frac{b}{c}q$, outer surface of $C \rightarrow \left[\frac{b}{c}-1\right]q$

B) Outer surface of $B \rightarrow \frac{b}{c}-1(q)$, outer surface of $C \rightarrow \frac{b}{c}-2$

C) Outer surface of $B \rightarrow \frac{c}{b}q$, outer surface of $C \rightarrow \frac{b}{c}-1$

D) Outer surface of $B \rightarrow \frac{b}{c}q$, outer surface of $C \rightarrow \frac{c}{b}q$

35. Few rods of material X and Y are connected as shown in fig. The cross sectional area of all the rods are same. If the end A is maintained at 80^0C and the end F is maintained at 10^0C. Calculate the temperature of junction B is



A) 50.5 ^{0}C B) 60.52 ^{0}C C) 12.1 ^{0}C D) 5.6 ^{0}C

36. The earth receives solar energy at the rate of $2\,\text{cal cm}^{-2}$ per minute. Assuming the radiation to be black body in character, estimate the surface temperature of the sun is ($\sigma = 5.67\times10^{-8}$ W m^{-2} K^{-4} and angular diameter of the sun = 32 minute of arc)

A) 6800 K B) 7800 K C) 4100 K D) 5810 K

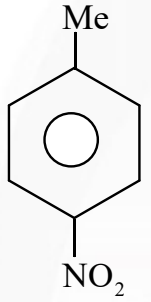
CHEMISTRY **Max Marks: 60**

SECTION-I
(INTEGER ANSWER TYPE)

- This section contains EIGHT (08) questions.
- The answer to each question is a SINGLE DIGIT INTEGER ranging from 0 TO 9, BOTH INCLUSIVE.
- For each question, enter the correct integer corresponding to the answer using the mouse and the on-screen virtual Numeric keypad in the place designated to enter the answer.
- Answer to each question will be evaluated **according to the following marking scheme**:

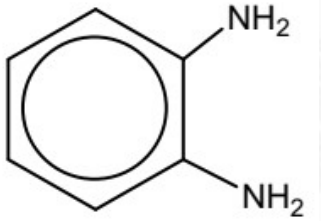
Full Marks: +3 If ONLY the correct integer is entered;
Zero Marks: 0 If the question is unanswered;
Negative Marks: -1 In all other cases

37. Identify the position of the bromine atom (as per IUPAC) in the final product 'C'



$$\xrightarrow[2)\ Sn/HCl]{1)\ Br_2} A \xrightarrow[2)\ H_3PO_2]{1)\ NaNO_2/HCl} B \xrightarrow[2)\ H^+]{1)\ KMnO_4/KOH} C$$

38.



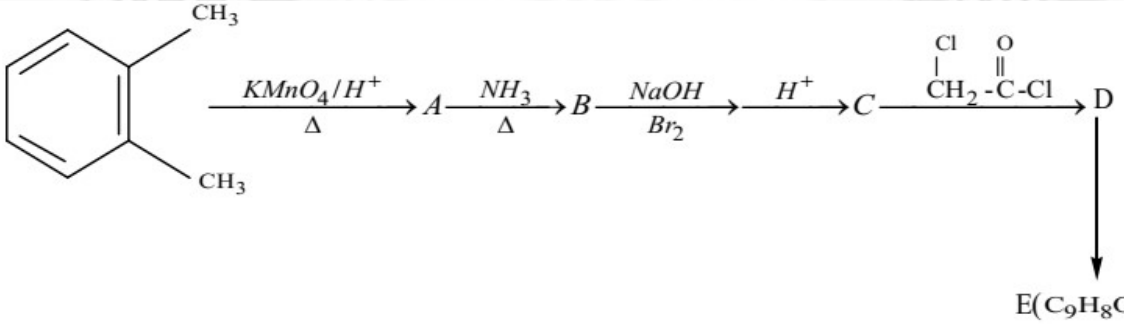
$$\xrightarrow[0-5^0C]{NaNO_2+HCl} X$$

Degree of unsaturation of X is

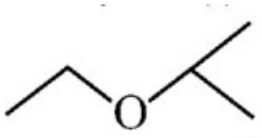
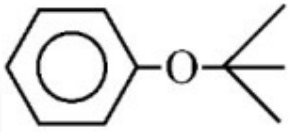
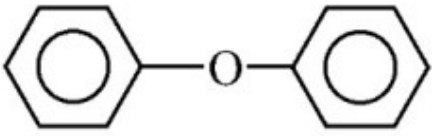
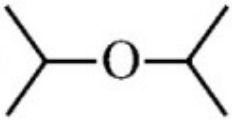
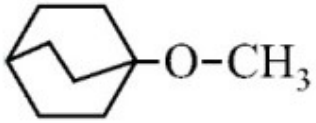
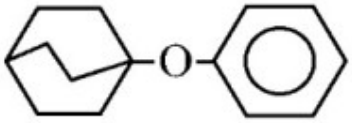
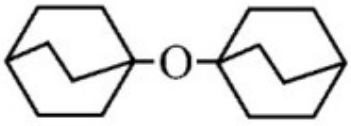
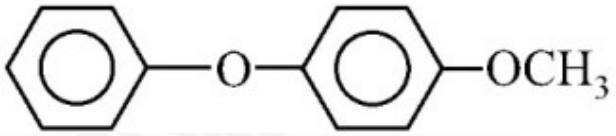
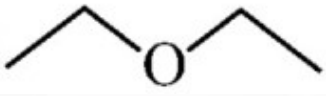
39. Among the following, total number of meta directing functional groups is ……. (integer based)

$-OCH_3, -NO_2, -CN, -CH_3, -NHCOCH_3, -COR, -OH, -COOH, -Cl, -SO_3H$

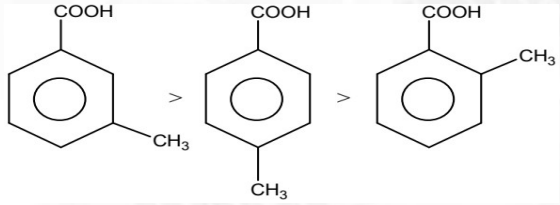
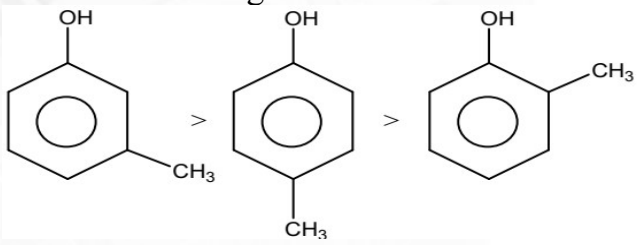
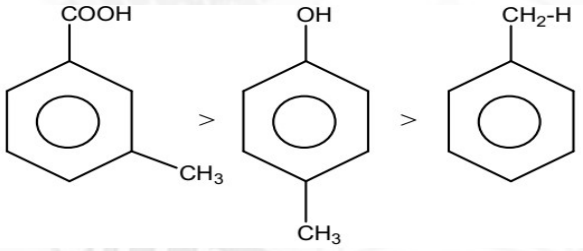
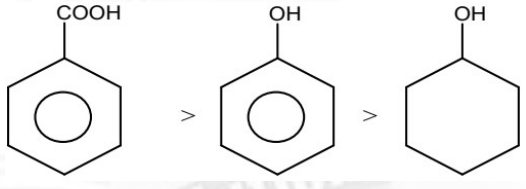
40. What is the degree of unsaturation of the final product 'E'



41. How many ether(s) will undergo cleavage on reaction with conc. HI?

I) 
II) 
III) 
IV) 
V) 
VI) 
VII) 
VIII) 
IX) 
X) $PhOC_2H_5$

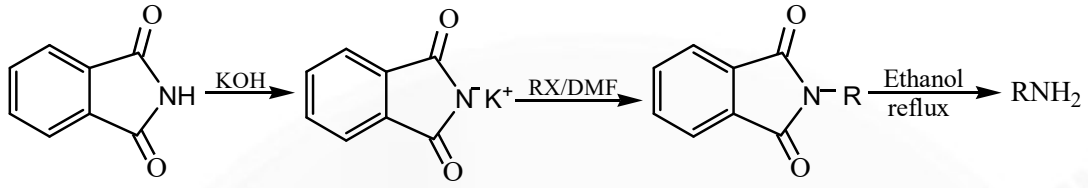
42. How many of the following is/are correct order for acidic strength?

I) 
II) 
III) 
IV) 

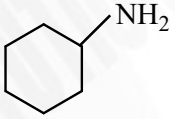
V) Ph-OH > CH_3COOH > CH_3OH

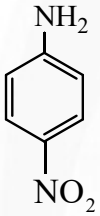
43. $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_3 \xrightarrow{Br_2/hv}$ monobromo compound X (major). The number of possible stereoisomers, X can have ……

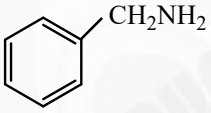
44.

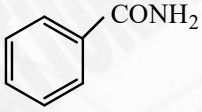


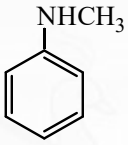
Out of the given amines, how many cannot be prepare by this method

1) $CH_3CH_2NH_2$ 2) CH_3NHCH_3 3) $CH_2 = CH - NH_2$ 4) 

5) 

6) 

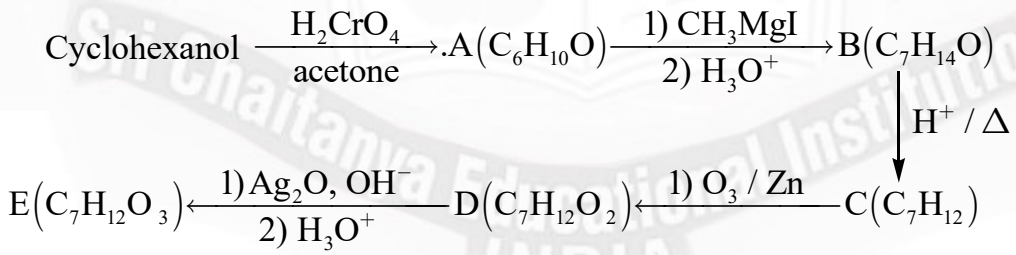
7) 

8) 

SECTION – II
(ONE OR MORE CORRECT ANSWER TYPE)

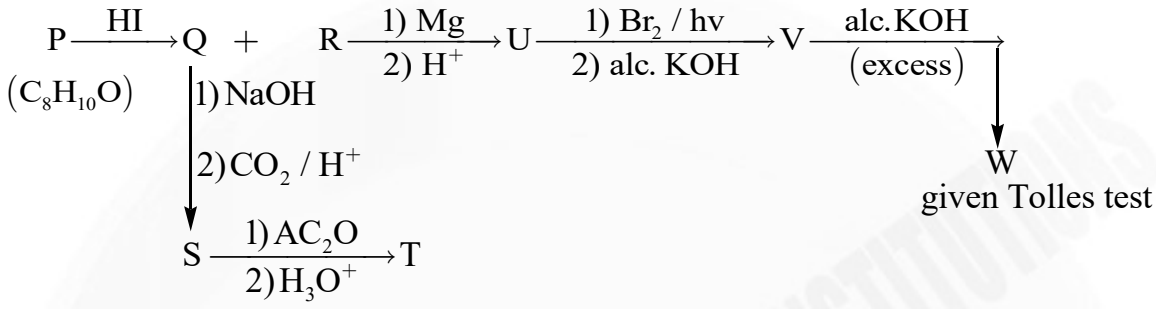
•This section contains SIX (06) questions.
•Each question has FOUR options. **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
•For each question, choose the option(s) corresponding to (all) the correct answer(s).
•Answer to each question will be evaluated **according to the following marking scheme**:
Full Marks: +4 If only (all) the correct option(s) is(are) chosen; *Partial Marks* +3 If all the four options are correct but ONLY three options are chosen;
Partial Marks: +2 If three or more options are correct but ONLY two options are chosen, both of which are correct;
Partial Marks: +1 If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks: 0 If none of the options is chosen (i.e. the question is unanswered);
Negative Marks: -2 In all other cases.

45. In the below given reaction sequence, identify the correct statements about products of A, B, C, D, E



A) Product B gives turbidity faster with lucas reagent
B) Product A can react with 2, 4 DNP
C) Product D can undergo intramolecular aldol condensation
D) Product E can liberate CO_2 with $NaHCO_3$

46. In the given reaction scheme, P is phenyl alkyl ether, Q is an aromatic compound, R and S are the other organic products.



Correct statements about products.

A) Product 'S' can also prepared from phenol reaction with CCl_4 / KOH

B) Conversion of Q to S is an example of aromatic electrophilic substitution reaction

C) Product 'T' is as non-steroidal anti-inflammatory drug.

D) Product 'W' ethyne

47. $R-\overset{O}{\overset{\|}{C}}-Cl \xrightarrow[(ii)\ H_2O]{(i)\ NaN_3\ /\ \Delta} RNH_2$ (Curtius reaction)

$R-\overset{O}{\overset{\|}{C}}-OH \xrightarrow[H_2SO_4]{HN_3} RNH_2$ (Schmidt reaction)

$R-\overset{O}{\overset{\|}{C}}-NH_2 \xrightarrow{Br_2\ /\ NaOH} RNH_2$.(Hoff mann bromide reaction)

What are common in above reaction?

A) intermediate is $R-N=C=O$

B) All the above reactions will give retention of configuration product

C) All the reactions involve intra molecular migration of alkyl group.

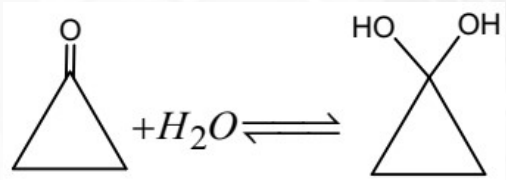
D) Stereo chemistry of R group is maintained and here migration of R from carbon to Nitrogen takes place

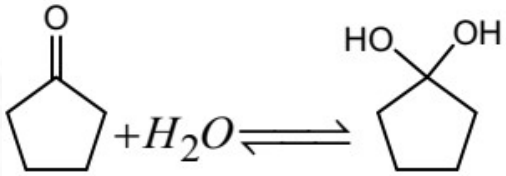
48. Which of the following is/are correct about the final product (A), formed in the following reaction sequence is :

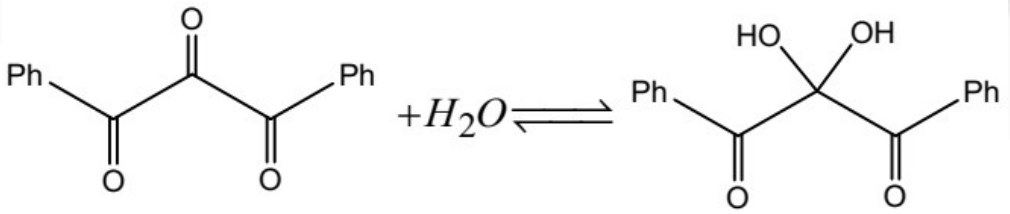
$$Ph-CH=CH_2 \xrightarrow[\text{iii) HBr}]{\substack{\text{i) } BH_3 \\ \text{ii) } H_2O_2 \mid \overset{\ominus}{O}H \\ \text{iii) HBr} \\ \text{iv) Mg/ether than} \\ HCHO / H_3O^+}} A \text{ (product)}$$

A) IUPAC nomenclature of Product A is 3-phenyl propanol
B) Product A is 2-phenyl propanol
C) In the formation of product 'A' one of the step involved nucleophilic substitution neighbouring group participation
D) Product A gives 3-phenyl propanoic acid upon oxidation with anhydrous CrO_3

49. For which of the following equilibrium, equilibrium constant $K_C > 1$

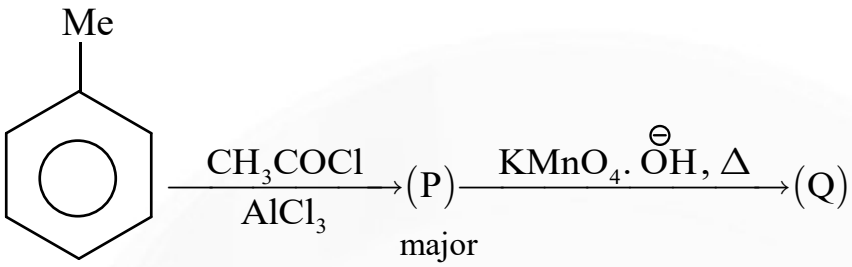
A) 

B) 

C) 

D) $CF_3CHO + H_2O \rightleftharpoons CF_3CH(OH)_2$

50.



Choose correct option(s)

A) (Q) is soluble in *aq.* $NaHCO_3$ as well as in *aq NaOH* .

B) (Q) is more acidic than benzoic acid

C) (P) will give yellow crystal with NaOI

D) (Q) is terephthalic acid

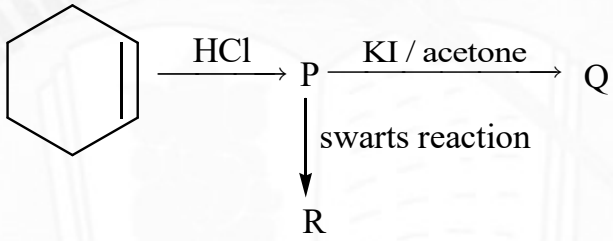
SECTION – III
(SINGLE CORRECT ANSWER TYPE)

This section contains **FOUR (04)** questions.

- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated according to the following marking scheme:

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

51. For the reaction sequence given below, the correct statement(s) is/are



I) Formation of product 'P' is an example of electrophilic addition reaction

II) Formation of product 'P' is an example of electrophilic substitution reaction

III) Conversion of product 'P' to product 'Q' is an example of bimolecular reaction

IV) Conversion of product 'P' to product 'Q' is an example of unimolecular reaction

V) Product R is alkyl fluoride

A) I, III, V are correct

B) I and II are correct

C) Only IV is correct

D) All are correct

52. Name of the end product in the following series of reaction.

$$C_6H_5CO_2H \xrightarrow{NH_3} P \xrightarrow{\text{heating}} Q \xrightarrow[(2)\,LiAlH_4 / H^+]{(1)\,P_2O_5 / \Delta} R$$

A) Aniline B) P-methyl aniline

C) Benzamide D) Benzyl amine

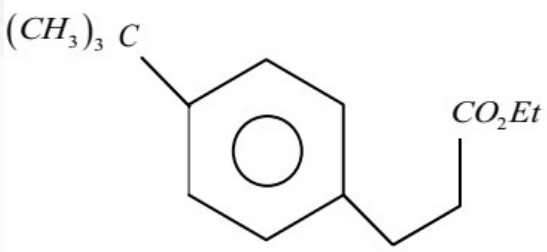
53. Which one is the best method of reducing 3-bromopropanal to 1-bromopropane?

$Br - CH_2CH_2CHO \rightarrow Br - CH_2CH_2CH_3$

A) Wolf-Kishner reduction B) Clemmensen reduction

C) Both A and B D) Wurtz reaction

54. The reaction of compound P with CH_3MgBr (excess) in $(C_2H_5)_2O$ followed by addition of H_2O gives Q. The compound Q on treatment with H_2SO_4 at 0^0C gives R. Compound R with CH_3COCl in presence of anhydrous $AlCl_3$ in CH_2Cl_2 followed by treatment with H_2O produces compound S. The no. of carbons and degree of unsaturation in S is …….. and …… respectively. The compound P is



A) 17 and 7 B) 17 and 6 C) 16 and 5 D) 16 and 6

Sri Chaitanya Educational Institutions | Infinity Learn

Sri Chaitanya Techno School
The right mentor for IIT (JEE), NEET, Olympiad & all Other Competitive exams

40 Years of Excellence 1986-2025

JEE MAIN 2025

31 STUDENTS BELOW 100 AIR

VANGALA AJAY REDDY
APP. NO. 250310255592
CLASSROOM STUDENT FROM GRADE IX - XII

DEVDUTTA MAJHI
APP. NO. 250310016185
DLP/AITS STUDENT

TOSHNIWAL SHIVEN
APP. NO. 250310391420
DLP/AITS STUDENT

SAKSHAM JINDAL
APP. NO. 250310236696
DLP/AITS STUDENT

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

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