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JEE ADVANCED



Sri Chaitanya IIT Academy., India.

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A right Choice for the Real Aspirant

ICON Central Office, Madhapur – Hyderabad

Sec: Sr.Super60_STERLING BT

JEE-ADV_2023-P1

Date: 21-09-2025

Time: 09.00Am to 12.00Noon

RPTA-07

Max. Marks :180

MATHEMATICS

CHEMISTRY

: 3D and Vectors

: Biomolecules (Carbohydrates, Amino acids, DNA and RNA, Vitamins):

Biomolecules: Carbohydrates: Classification, Mono- and di-saccharides (glucose and sucrose), Oxidation, Reduction, Glycoside formation and hydrolysis of disaccharides (sucrose, maltose, lactose), Anomers. Proteins: Amino acids, Peptide linkage, Structure of peptides (primary and secondary), Types of proteins (fibrous and globular). Isoelectric pH Nucleic acids: Chemical composition and structure of DNA and RNA, Vitamins Chemistry in Everyday Life: Drug target interaction, Therapeutic action, and examples (excluding structures), of antacids, antihistamines, tranquilizers, analgesics, antimicrobials, and antifertility drugs, Artificial sweeteners (names only), Soaps, detergents, and cleansing action.

POC: Detection of elements (N, S, halogens), Detection and identification of the following functional groups: hydroxyl (alcoholic and phenolic), carbonyl (aldehyde and ketone), carboxyl, amino and nitro. Separation of Binary mixture, Purification and characterization of organic compounds.

NOTE: Chemistry in Everyday Life (not in JEE Mains)

NOTE: Hormones (General introduction) Added in Biomolecules

PHYSICS

: Current Electricity: Electric current, Ohm's law, Series and parallel arrangements of resistances and cells, Kirchhoff's laws and simple applications, Heating effect of current. voltmeter, ammeter and their conversions. Experiments: Verification of Ohm's law using voltmeter and ammeter, and specific resistance of the material of a wire using meter bridge and post office box, Resistance and figure of merit of a galvanometer by half deflection method & RC. Circuits with DC sources. Potentiometer-(i) Comparison of emf of two primary cells. (ii) Determination of internal resistance of a cell. (Important for Advanced)

Name of the Student: _____

H.T. NO:

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JEE-ADVANCE-2023-P1-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 – 3)	Questions with Multiple Correct Choice with partial mark!	+4	-2	3	12
Sec – II(Q.N : 4 – 7)	Questions with Single Correct Choice	+3	-1	4	12
Sec – III(Q.N : 8 – 13)	Questions with Integer Answer Type	+4	0	6	24
Sec – IV(Q.N : 14 – 17)	Matching Type	+3	-1	4	12
Total				17	60

PHYSICS:

Section	Question Type	+Ve Marks	- Ve Marks	No.of Qs	Total marks
Sec – I(Q.N : 18 – 20)	Questions with Multiple Correct Choice with partial mark	+4	-2	3	12
Sec – II(Q.N : 21 – 24)	Questions with Single Correct Choice	+3	-1	4	12
Sec – III(Q.N : 25 – 30)	Questions with Integer Answer Type	+4	0	6	24
Sec – IV(Q.N : 31 – 34)	Matching Type	+3	-1	4	12
Total				17	60

CHEMISTRY:

Section	Question Type	+Ve Marks	- Ve Marks	No.of Qs	Total marks
Sec – I(Q.N : 35 – 37)	Questions with Multiple Correct Choice with partial mark	+4	-2	3	12
Sec – II(Q.N : 38 – 41)	Questions with Single Correct Choice	+3	-1	4	12
Sec – III(Q.N : 42 – 47)	Questions with Integer Answer Type	+4	0	6	24
Sec – IV(Q.N : 48 – 51)	Matching Type	+3	-1	4	12
Total				17	60

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Space for rough work

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MATHEMATICS

Max Marks: 60

SECTION – I
(ONE OR MORE CORRECT ANSWER TYPE)This section contains **THERE (03)** questions.

- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- 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 **ONLY** if (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** two options are 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.

For example, in a question, if (A), (B) and (D) are the **ONLY** three options corresponding to correct answers, then choosing **ONLY** (A), (B) and (D) will get +4 marks; choosing **ONLY** (A) and (B) will get +2 marks; choosing **ONLY** (A) and (D) will get +2 marks; choosing **ONLY** (B) and (D) will get +2 marks; choosing **ONLY** (A) will get +1 mark; choosing **ONLY** (B) will get +1 mark; choosing **ONLY** (D) will get +1 mark; choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get -2 marks.

1. Let ABC be a triangle such that $\overline{BC} = \overline{a}, \overline{CA} = \overline{b}, \overline{AB} = \overline{c}, |\overline{a}| = 6\sqrt{2}, |\overline{b}| = 2\sqrt{3}$ and $\overline{b} \cdot \overline{c} = 12$ then

A) $\angle ACB = \cos^{-1}\left(\frac{2}{\sqrt{3}}\right)$

B) $\angle ACB = \cos^{-1}\left(\sqrt{\frac{2}{3}}\right)$

C) $|\overline{C}| = 6$

D) $|\overline{a} \times \overline{b} + \overline{c} \times \overline{b}| - |\overline{c}| = -6$

2. Let the line passing through the points $P(2, -1, 2)$ $Q(5, 3, 4)$ meet the plane $x - y + z = 4$ at the point $R(\alpha, \beta, \gamma)$ the distance of the point R from the plane $x + 2y + 3z + 2 = 0$ measured parallel to the line $\frac{x-7}{2} = \frac{y+3}{2} = \frac{z-2}{1}$ is 'd' then

A) $d + \gamma = 3$

B) $\alpha^2 + \beta^2 + \gamma^2 = 26$

C) $|\alpha - \beta| = 4$

D) $d^2 - \alpha^2 = 8$

3. Let $\overline{a} = 4\hat{i} + 3\hat{j}$ and $\overline{b} = 3\hat{i} - 4\hat{j} + 5\hat{k}$ and \overline{c} is a vector such that $\overline{c} \cdot (\overline{a} \times \overline{b}) + 25 = 0, \overline{c} \cdot (\hat{i} + \hat{j} + \hat{k}) = 4$ and projection of \overline{c} on \overline{a} is '1', then

A) Projection of \overline{c} on $\overline{b} = \sqrt{\frac{5}{2}}$

B) Projection of \overline{c} on $\overline{b} = \frac{5}{\sqrt{2}}$

C) $|\overline{c}| = \sqrt{14}$

D) $|\overline{c}| = \sqrt{13}$

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Space for rough work

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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 KOUNDINYA
AIR 1
SRI CHAITANYA
300
300
MARKS



JEE Advanced 2023
RANK 1
VAVILALA
CHIDVILAS REDDY
AIR 1
SRI CHAITANYA
341
360
MARKS



NEET 2023
RANK 1
BORA VARUN
CHAKRAVARTHI
AIR 1
SRI CHAITANYA
720
720
MARKS



SECTION – II

(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

4. Consider the set of eight vectors $V = \{a\hat{i} + b\hat{j} + c\hat{k}; a, b, c \in \{-1, 1\}\}$

Three non-coplanar vectors can be chosen from V in 2^P ways. Then 'P' is

- A) 2 B) 5 C) 4 D) 3

5. In R^3 , Let 'L' be a straight line passing through the origin, suppose that all the points on L are at a constant distance from the two planes $P_1: x + 2y - z + 1 = 0$ and

$P_2: 2x - y + z - 1 = 0$. Let M be the locus of the feet of the perpendicular drawn from the points on L to the plane P_1 , then M passes through

- A) $\left(0, -\frac{5}{6}, \frac{2}{3}\right)$ B) $\left(0, -\frac{5}{6}, -\frac{2}{3}\right)$ C) $\left(-\frac{1}{6}, \frac{1}{3}, \frac{1}{6}\right)$ D) $\left(\frac{1}{6}, \frac{1}{3}, -\frac{1}{6}\right)$

6. Let \vec{a} be vector parallel to line of intersection of planes P_1 and P_2 . Plane P_1 parallel to the vectors $2\hat{j} + 3\hat{k}$ and $4\hat{j} - 3\hat{k}$ and P_2 is parallel to $\hat{j} - \hat{k}$ and $3\hat{i} + 3\hat{j}$, then the angle between vector \vec{a} and a given vector $2\hat{i} + \hat{j} - 2\hat{k}$ is

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

7. For $P > 0$, a vector $\vec{V}_2 = 2\hat{i} + (p+1)\hat{j}$ is obtained by rotating the vector $\vec{V}_1 = \sqrt{3}P\hat{i} + \hat{j}$ by an angle θ about origin in counter clock wise direction. If $\tan \theta = \frac{\alpha\sqrt{3} - 2}{3 + 4\sqrt{3}}$ then the value of α is

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

SECTION-III

(NON-NEGATIVE INTEGER.)

This section contains SIX (06) questions.

- The answer to each question is a **NON-NEGATIVE INTEGER**.
 - For each question, enter the correct integer corresponding to the answer using the mouse and the onscreen 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 : +4 If ONLY the correct integer is entered; Zero Marks : 0 In all other cases.

8. If \bar{a} and \bar{b} are unit vectors, then the greatest value of $\sqrt{3}|\bar{a} + \bar{b}| + |\bar{a} - \bar{b}|$ is
9. A ray of light passing through the point $A(1,2,3)$ strikes the plane $x + y + z = 12$ at B and on reflection passes through point $C(3,5,9)$. The coordinates of point B are (α, β, γ) then $\alpha + \beta + \gamma =$
10. The value of $|m|$ for which straight line $3x - 2y + z + 3 = 0 = 4x - 3y + 4z + 1$ is parallel to the plane $2x - y + mz - 2 = 0$ is
11. If the shortest distance between the lines $\frac{x-2}{3} = \frac{y+1}{2} = \frac{z-6}{2}$ and $\frac{x-6}{\lambda} = \frac{1-y}{2} = \frac{z+8}{0}$ is 14, then integral value of $\lambda =$
12. Consider a triangle ABC whose vertices are $A(0, \alpha, \alpha)$, $B(\alpha, 0, \alpha)$ and $C(\alpha, \alpha, 0)$, $\alpha > 0$. Let D be a point moving on the line $x + z - 3 = 0 = y$ and G be the centroid of triangle ABC. If the minimum length of GD is $\sqrt{\frac{57}{2}}$ then α is equal to
13. If \vec{b} is a vector whose initial point divides the join of $5\hat{i}$ & $5\hat{j}$ in the ratio K:1 and whose terminal point is the origin and $|\vec{b}| \leq \sqrt{37}$ then 'K' lies in the interval $R - (\alpha, \beta)$ then $\alpha^2 =$

SECTION - IV
(MATCHING TYPE)

This section contains FOUR (04) Matching List Sets.

- Each set has ONE Multiple Choice Question.
- Each set has TWO lists : List-I and List-II.
- List-I has Four entries (I), (II), (III) and (IV) and List-II has Five entries (P), (Q), (R), (S) and (T).
- FOUR options are given in each Multiple Choice Question based on List-I and List-II and ONLY ONE of these four options satisfies the condition asked in the Multiple Choice Question.

- Answer to each question will be evaluated according to the following marking scheme :

Full Marks: +3 ONLY if the option corresponding to the correct combination 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.

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Space for rough work

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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 KOUNDINYA
 RANK 1
 300 MARKS



JEE Advanced 2023
 VAVILALA CHIDVILAS REDDY
 RANK 1
 341 MARKS



NEET 2023
 BORLA VARUN CHAKRAVARTHI
 RANK 1
 720 MARKS



14. Consider the lines $L_1: \frac{x-1}{2} = \frac{y}{-1} = \frac{z+3}{1}$, $L_2: \frac{x-4}{1} = \frac{y+3}{1} = \frac{z+3}{2}$ and the planes $P_1: 7x + y + 2z = 3$, $P_2: 3x + 5y - 6z = 4$. Let $ax + by + cz = d$ be the equation of the plane passing through the point of intersection of lines L_1 and L_2 and perpendicular to planes P_1 and P_2 . Match List-I with List-II

	COLUMN-I		COLUMN-II
I)	a	P)	13
II)	b	Q)	-3
III)	c	R)	1
IV)	d	S)	-2
		T)	5

- A) $(I) \rightarrow (R), (II) \rightarrow (Q), (III) \rightarrow (S), (IV) \rightarrow (P)$
 B) $(I) \rightarrow (P), (II) \rightarrow (R), (III) \rightarrow (S), (IV) \rightarrow (Q)$
 C) $(I) \rightarrow (R), (II) \rightarrow (Q), (III) \rightarrow (P), (IV) \rightarrow (S)$
 D) $(I) \rightarrow (Q), (II) \rightarrow (S), (III) \rightarrow (T), (IV) \rightarrow (R)$

15. Consider the lines $L_1: \frac{x+1}{3} = \frac{y+2}{1} = \frac{z+1}{2}$, $L_2: \frac{x-2}{1} = \frac{y+2}{2} = \frac{z-3}{3}$

Match List-I with List-II

	List -I		List -II
I)	Sum of Dr's of The unit vector perpendicular to both L_1 and L_2	P)	$\frac{17}{5\sqrt{3}}$
II)	The shortest distance between L_1 and L_2 is	Q)	$\frac{-\sqrt{3}}{5}$
III)	The distance of the point (1,1,1) from the plane passing through the point (-1,-2,-1) and whose normal is perpendicular to both the lines L_1 and L_2 is	R)	3
IV)	Sum of Dr's of normal to the plane passing through L_1 and L_2 is	S)	$\frac{13}{\sqrt{75}}$
		T)	$\frac{12}{\sqrt{5}}$

- A) $(I) \rightarrow (P) (II) \rightarrow (R) (III) \rightarrow (S) (IV) \rightarrow (T)$
 B) $(I) \rightarrow (Q) (II) \rightarrow (P) (III) \rightarrow (R) (IV) \rightarrow (S)$
 C) $(I) \rightarrow (Q) (II) \rightarrow (P) (III) \rightarrow (S) (IV) \rightarrow (R)$
 D) $(I) \rightarrow (P) (II) \rightarrow (T) (III) \rightarrow (Q) (IV) \rightarrow (R)$

16. Let $\vec{a}, \vec{b}, \vec{c}$ are three vectors then match List-I with List-II

	List -I		List -II
I)	Volume of parallelepiped determined by vectors \vec{a}, \vec{b} and \vec{c} is 2. Then the volume of the parallelepiped determined by vectors $2(\vec{a} \times \vec{b}), 3(\vec{b} \times \vec{c})$ and $(\vec{c} \times \vec{a})$ is	P)	100
II)	Volume of parallelepiped determined by vectors \vec{a}, \vec{b} and \vec{c} is 5. Then the volume of the parallelepiped determined by vectors $3(\vec{a} + \vec{b}), (\vec{b} + \vec{c}),$ and $2(\vec{c} + \vec{a})$ is	Q)	30
III)	Area of triangle with adjacent sides determined by vectors \vec{a} and \vec{b} is 20. Then the area of the triangle with adjacent sides determined by vectors $(2\vec{a} + 3\vec{b})$ and $(\vec{a} - \vec{b})$ is	R)	24
IV)	Area of a parallelogram with adjacent sides determined by vectors \vec{a} & \vec{b} is 30. Then the area of the parallelogram with adjacent sides determined by vectors $(\vec{a} + \vec{b})$ and \vec{a} is	S)	60

A) (I) \rightarrow (S) (II) \rightarrow (Q) (III) \rightarrow (R) (IV) \rightarrow (P) B) (I) \rightarrow (Q) (II) \rightarrow (R) (III) \rightarrow (P) (IV) \rightarrow (S)

C) (I) \rightarrow (R) (II) \rightarrow (S) (III) \rightarrow (P) (IV) \rightarrow (Q) D) (I) \rightarrow (P) (II) \rightarrow (S) (III) \rightarrow (R) (IV) \rightarrow (Q)

17. Consider the following linear equations $ax + by + cz = 0$, $bx + cy + az = 0$, $cx + ay + bz = 0$ then match List-I with List-II.

	List -I		List -II
I)	$a + b + c \neq 0, a^2 + b^2 + c^2 = ab + bc + ca$	P)	The equations represent planes meeting only at single point
II)	$a + b + c = 0, a^2 + b^2 + c^2 \neq ab + bc + ca$	Q)	The equations represent the line $x = y = z$
III)	$a + b + c \neq 0, a^2 + b^2 + c^2 \neq ab + bc + ca$	R)	The equations represent identical planes
IV)	$a + b + c = 0, a^2 + b^2 + c^2 = ab + bc + ca$	S)	The equations represent the whole of the three dimensional space

A) (I) \rightarrow (P) (II) \rightarrow (S) (III) \rightarrow (R) (IV) \rightarrow (Q)

B) (I) \rightarrow (Q) (II) \rightarrow (R) (III) \rightarrow (P) (IV) \rightarrow (S)

C) (I) \rightarrow (S) (II) \rightarrow (P) (III) \rightarrow (Q) (IV) \rightarrow (R)

D) (I) \rightarrow (R) (II) \rightarrow (Q) (III) \rightarrow (P) (IV) \rightarrow (S)

PHYSICS

Max Marks: 60

SECTION – I

(ONE OR MORE CORRECT ANSWER TYPE)

This section contains **THERE (03)** questions.

- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- 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 **ONLY** if (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** two options are chosen, and it is a correct option ;

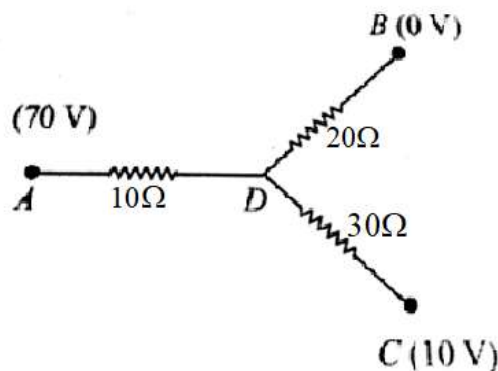
Zero Marks : 0 If none of the options is chosen (i.e. the question is unanswered);

Negative Marks : -2 In all other cases.

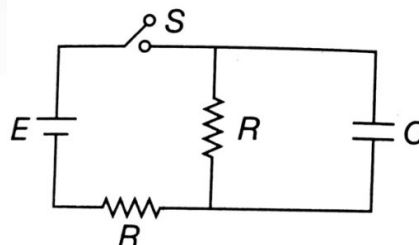
For example, in a question, if (A), (B) and (D) are the **ONLY** three options corresponding to correct answers, then choosing **ONLY** (A), (B) and (D) will get +4 marks; choosing **ONLY** (A) and (B) will get +2 marks; choosing **ONLY** (A) and (D) will get +2 marks; choosing **ONLY** (B) and (D) will get +2 marks; choosing **ONLY** (A) will get +1 mark; choosing **ONLY** (B) will get +1 mark; choosing **ONLY** (D) will get +1 mark; choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get -2 marks.

18. In the network shown, points A, B and C are at potentials

$V_A = 70V, V_B = 0, V_C = 10V$ and V_D respectively. Then



- A) $V_D = 40V$
- B) The currents in the sections AD, DB, DC are in the ratio 3:2:1.
- C) The currents in the sections AD, DB, DC are in the ratio 1:2:3.
- D) The network draws a total power of 200W
19. In the circuit shown in figure, the switch S is closed at $t = 0$. The voltage across the capacitor C at time t after the switch S is closed is V . The voltage as $t \rightarrow \infty$ is V_0 .



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Space for rough work

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A) $V = \frac{E}{3}(1 - e^{-3t/RC})$

B) $V_0 = \frac{E}{3}$

C) $V = \frac{E}{2}(1 - e^{-2t/RC})$

D) $V_0 = \frac{E}{2}$

20. Two heaters designed for the same voltage V have different power ratings. When connected individually across a source of voltage V , they produce H amount of heat each time t_1 and t_2 respectively. When used together across the same source, they produce H amount of heat in time t

A) If they are in series, $t = t_1 + t_2$

B) If they are in series, $t = 2(t_1 + t_2)$

C) If they are in parallel, $t = \frac{t_1 t_2}{(t_1 + t_2)}$

D) If they are in parallel, $t = \frac{t_1 t_2}{2(t_1 + t_2)}$

SECTION – II (SINGLE CORRECT ANSWER TYPE)

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

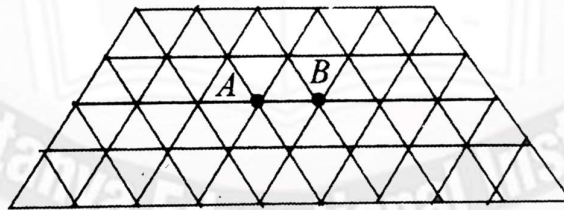
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated according to the following marking scheme:

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

21. There is an infinite wire grid with cells in the form of equilateral triangles. The resistance of each wire between neighboring joint connections is R_0 . The net resistance of the whole grid between the points A and B as shown is



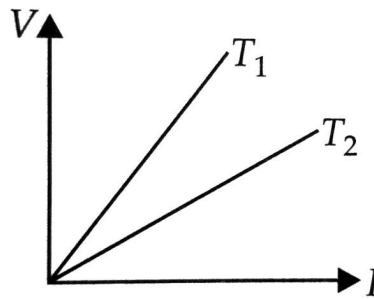
A) R_0

B) $\frac{R_0}{2}$

C) $\frac{R_0}{3}$

D) $\frac{R_0}{4}$

22. The voltage V and current I graph for a metal conductor at two different temperatures T_1 and T_2 are shown in figure. The relation between T_1 and T_2 is

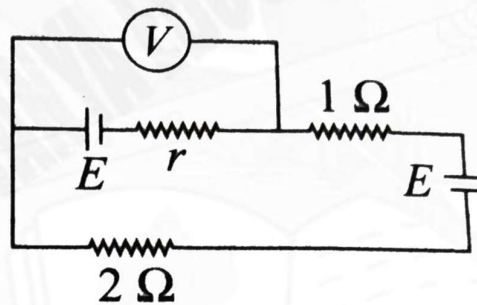


- A) $T_1 > T_2$ B) $T_1 < T_2$ C) $T_1 = T_2$ D) $T_1 \approx T_2$

23. A galvanometer of resistance 50Ω is connected to a battery of $3V$ along with resistance of 2950Ω in series. A full scale deflection of 30 divisions is obtained in the galvanometer. In order to reduce this deflection to 20 divisions, the above series resistance should be

- A) 4450Ω B) 5050Ω C) 5550Ω D) 6050Ω

24. In the given circuit, the reading of ideal voltmeter is $E/2$. The internal resistance (r) of the battery is



- A) 1Ω B) $\frac{2}{3} \Omega$ C) $\frac{2}{5} \Omega$ D) $\frac{5}{2} \Omega$

SECTION-III

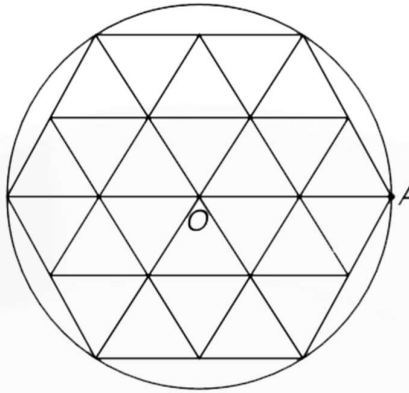
(NON-NEGATIVE INTEGER.)

This section contains **SIX (06)** questions.

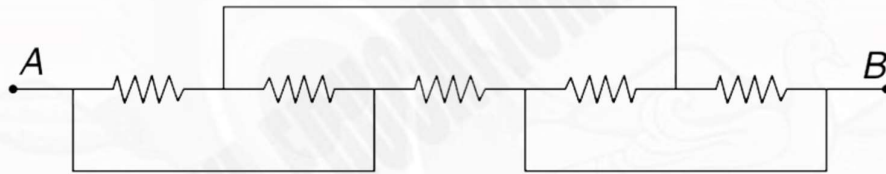
- The answer to each question is a **NON-NEGATIVE INTEGER**.
- For each question, enter the correct integer corresponding to the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer.
- Answer to each question will be evaluated according to the following marking scheme

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

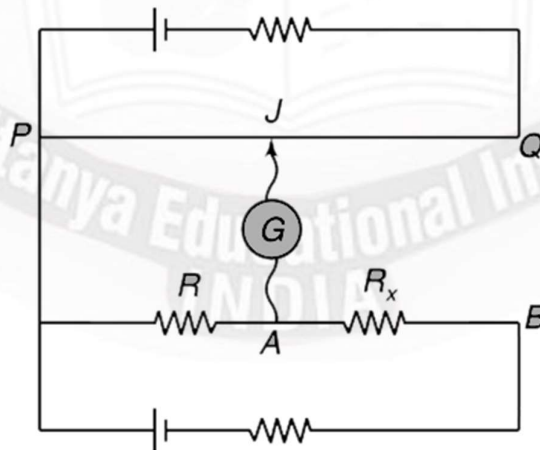
25. In the Figure, each segment (side of small triangle) has resistance R and the wire used in the circumference of the circle has negligible resistance. If equivalent resistance between point O and A is $\frac{R}{N} \Omega$ then 'N' value is _____



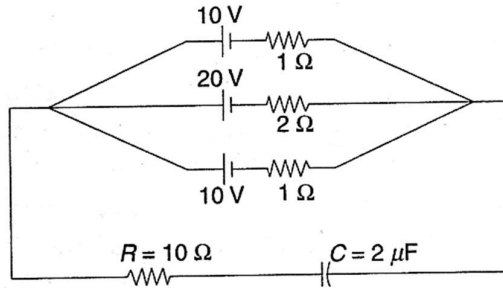
26. If equivalent resistance between points A and B in the figure is $\frac{R}{N}$ then 'N' value _____ (Assume each resistance is R).



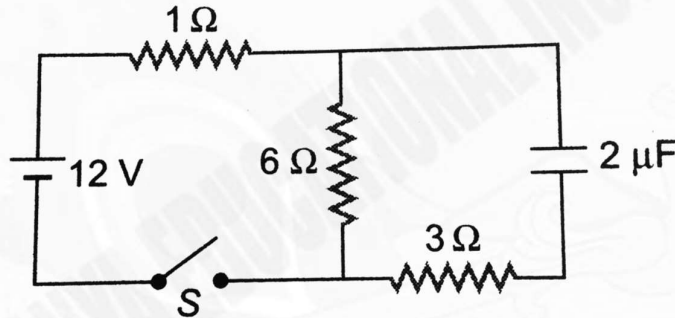
27. In the figure shown PQ is a potentiometer wire. When galvanometer is connected at A, it shows zero deflection when $PJ = x$. Now the galvanometer is connected to B and it shows zero deflection when $PJ = 3x$. If the value of unknown resistance $R_x = NR$ then 'N' value. _____



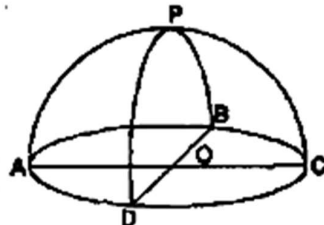
28. Find the charge on the capacitor in the circuit shown in fig.(in μC)



29. When the switch is closed, the initial current through the 1Ω resistor is _____ (in A)



30. A hemispherical network of radius a is made by using a conducting wire of resistance per unit length $\lambda = \left(\frac{64}{2+\pi}\right)\frac{1}{a}$. Find the equivalent resistance, in ohm, across OP.



SECTION – IV (MATCHING TYPE)

This section contains **FOUR (04)** Matching List Sets.

- Each set has **ONE** Multiple Choice Question.
- Each set has **TWO** lists : **List-I** and **List-II**.
- **List-I** has **Four** entries (I), (II), (III) and (IV) and **List-II** has **Five** entries (P), (Q), (R), (S) and (T).
- **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question.

• Answer to each question will be evaluated according to the following marking scheme :

Full Marks: +3 **ONLY** if the option corresponding to the correct combination is chosen;

Zero Marks: 0 If none of the options is chosen (i.e. the question is unanswered);

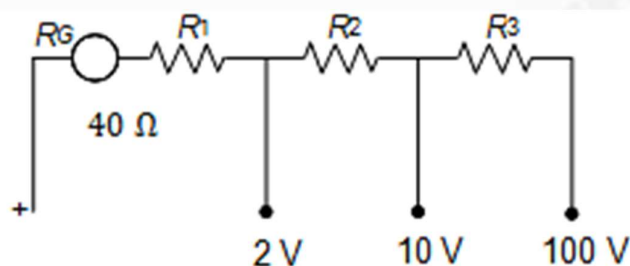
Negative Marks: -1 In all other cases.

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31. Figure shows the internal wiring of a three-range voltmeter whose binding posts are marked '+', 2 V, 10 V and 100 V. When the meter is connected to the circuit being measured, one connection is made to the post marked '+' and the other to the post marked with the desired voltage range. The resistance of the moving coil R_G is 40Ω , and a current of 1 mA in the coil causes it to deflect full – scale. Then match the following



	COLUMN-I		COLUMN-II
I)	Value of resistance R_1 in $k\Omega$	P)	100
II)	Value of resistance R_3 in $k\Omega$	Q)	2
III)	Overall resistance of the meter in 100 V range in $k\Omega$	R)	1.96
IV)	Overall resistance of the meter in 2 V range in $k\Omega$	S)	90

- A) $(I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (P), (IV) \rightarrow (Q)$
 B) $(I) \rightarrow (R), II \rightarrow (P), (III) \rightarrow (Q), (IV) \rightarrow (S)$
 C) $(I) \rightarrow (S), II \rightarrow (Q), (III) \rightarrow (P), (IV) \rightarrow (R)$
 D) $(I) \rightarrow (Q), II \rightarrow (R), (III) \rightarrow (S), (IV) \rightarrow (P)$
32. Column I has four circuits each having an ammeter. Column II has four values of current in the ammeter. The ammeter has zero resistance. The voltmeter in (V) has infinite resistance and a reading 8 V. The resistance R has not been specified. Match the circuit with its correct ammeter reading.

	COLUMN-I		COLUMN-II
I)		P)	Zero
II)		Q)	2 A
III)		R)	4 A
IV)		S)	5 A

- A) (I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (P), (IV) \rightarrow (Q)
 B) (I) \rightarrow (R), II \rightarrow (P), (III) \rightarrow (Q), (IV) \rightarrow (S)
 C) (I) \rightarrow (P), II \rightarrow (Q), (III) \rightarrow (S), (IV) \rightarrow (R)
 D) (I) \rightarrow (S), II \rightarrow (R), (III) \rightarrow (P), (IV) \rightarrow (Q)

33. There wires of same material are connected in parallel to a battery. The length ratio of wires is 1:2:3 and the ratio of their area of cross- section is 2:4:1. Match the ratio of quantities in Column- I with their respective answers in COLUMN-II

	COLUMN-I		COLUMN-II
I)	Resistance	P)	1:1:1
II)	Current	Q)	6:6:1
III)	Power	R)	1:6:6
IV)	Conductivity	S)	1:1:6

- A) $(I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (P), (IV) \rightarrow (Q)$
 B) $(I) \rightarrow (R), II \rightarrow (P), (III) \rightarrow (Q), (IV) \rightarrow (S)$
 C) $(I) \rightarrow (S), II \rightarrow (Q), (III) \rightarrow (Q), (IV) \rightarrow (P)$
 D) $(I) \rightarrow (Q), II \rightarrow (R), (III) \rightarrow (S), (IV) \rightarrow (P)$
34. Match the consumption of power given in COLUMN-II to the corresponding appliance (s) given in COLUMN-I

	COLUMN-I		COLUMN-II
I)	100 W, 220 V bulb connected across 220 V supply	P)	300 W
II)	200 W, 220 V bulb connected across 220 V supply	Q)	66.7 W
III)	Above 100W and 200 W bulbs connected in series across a 220 V supply	R)	100 W
IV)	Above 100 W, 200 W bulbs connected in parallel across a 220 V supply	S)	200 W

- A) $(I) \rightarrow (Q), II \rightarrow (S), (III) \rightarrow (R), (IV) \rightarrow (P)$
 B) $(I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (Q), (IV) \rightarrow (P)$
 C) $(I) \rightarrow (S), II \rightarrow (Q), (III) \rightarrow (R), (IV) \rightarrow (P)$
 D) $(I) \rightarrow (Q), II \rightarrow (R), (III) \rightarrow (S), (IV) \rightarrow (P)$

CHEMISTRY

Max Marks: 60

SECTION – I

(ONE OR MORE CORRECT ANSWER TYPE)

This section contains **THERE (03)** questions.

- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- 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 **ONLY** if (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 ;

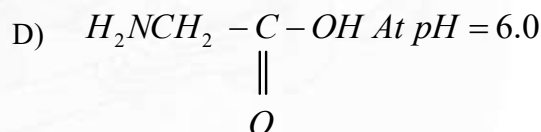
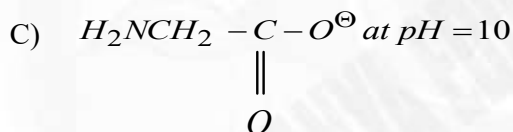
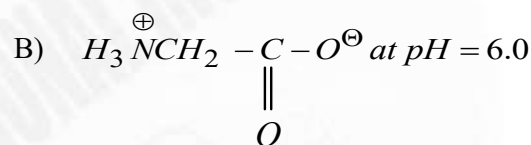
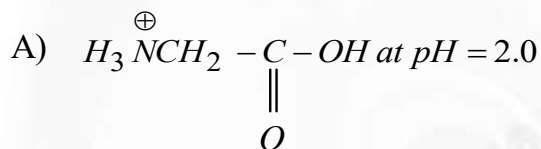
Partial Marks : +1 If two or more options are correct but **ONLY** two options are chosen, and it is a correct option ;

Zero Marks : 0 If none of the options is chosen (i.e. the question is unanswered);

Negative Marks : -2 In all other cases.

For example, in a question, if (A), (B) and (D) are the **ONLY** three options corresponding to correct answers, then choosing **ONLY** (A), (B) and (D) will get +4 marks; choosing **ONLY** (A) and (B) will get +2 marks; choosing **ONLY** (A) and (D) will get +2 marks; choosing **ONLY** (B) and (D) will get +2 marks; choosing **ONLY** (A) will get +1 mark; choosing **ONLY** (B) will get +1 mark; choosing **ONLY** (D) will get +1 mark; choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get -2 marks.

35. The correct structure if glycine at given pH are: (Isoelectric point of glycine $pI = 6$)



36. Some statements are given below the correct statements are.

A) Chlordiazepoxide and meprobamate are relatively mild tranquilizers suitable for relieving tension

B) Equanil is used in controlling depression and Hypertension

C) If the level of Noradrenaline is low then the person suffers from depression

D) Iproniazid contains heterocyclic ring where as phenelzine contains homocyclic ring

37. Which of the following will evolve CO_2 on reaction with $NaHCO_3$?

A) Acetyl Salicylic acid B) Picric acid C) Benzoic acid D) 2- Nitrophenol

SECTION – II

(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

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Space for rough work

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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 KOUNDINYA
AIR 1
300
300
MARKS



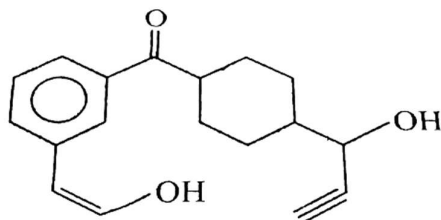
JEE Advanced 2023
RAVILALA
CHIDVILAS REDDY
AIR 1
341
360
MARKS



NEET 2023
BORA VARUN
CHAKRAVARTHI
AIR 1
720
720
MARKS



38.

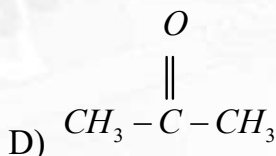
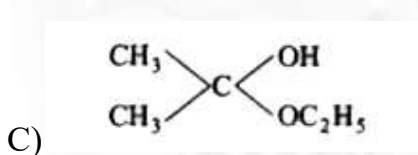
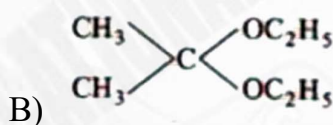
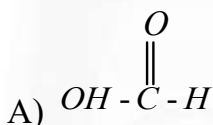


Which of the following reagents will not react with above compound?

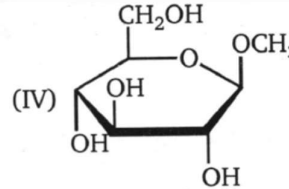
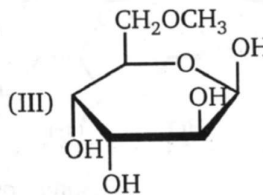
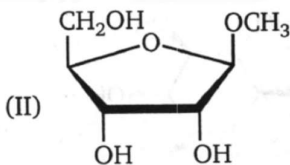
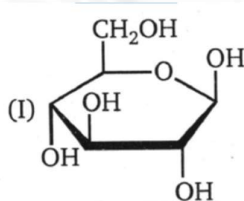
A) Na metal

B) $\text{AgNO}_3 + \text{NH}_4\text{OH}$ C) $\text{Cu}_2\text{Cl}_2 + \text{NH}_4\text{OH}$ D) NaHCO_3

39. Which of the following compounds give positive test with Tollen's reagent?



40. Which of the following carbohydrate (s) would undergo mutarotation in aqueous solution?



A) II only

B) I, III and IV only

C) II and IV only

D) I and III only

41. Which of the statements concerning the equilibrium shown is true?



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- A) The two structures are enantiomers of each other. They have equal but opposite optical rotations and racemize slowly at room temperature
- B) The two structures are enantiomers of each other. They racemize too rapidly at room temperature for their optical rotations to be measured
- C) The two structures are diastereomers of each other. They exist as two crystalline forms
- D) the two structures are diastereomers of each other. Their interconversion does not require breaking and making bonds, only a change in conformation

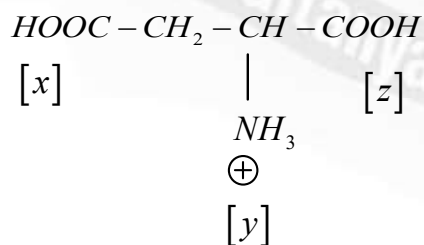
SECTION-III

(NON-NEGATIVE INTEGER.)

This section contains **SIX (06)** questions.

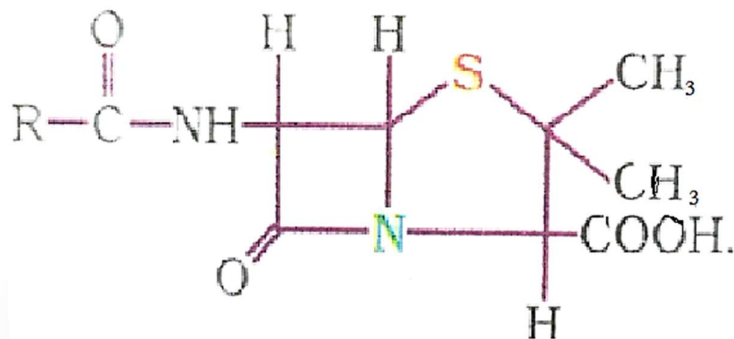
- The answer to each question is a **NON-NEGATIVE INTEGER**.
 - For each question, enter the correct integer corresponding to the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer.
 - Answer to each question will be evaluated according to the following marking scheme
- Full Marks : +4 If ONLY the correct integer is entered; Zero Marks : 0 In all other cases.

42. A sample of gaseous hydro carbon occupying 1 lit at NTP. When completely burnt in air produced 1.964g CO_2 and 1.607 g H_2O . Calculate the volume of O_2 (lit) at NTP required for its combustion.
43. In the sulphur estimation 0.471 g of an organic compound gave 1.44g of barium sulphate. The percentage of sulphur in the compound is _____ % (Nearest Integer) (Atomic Mass of $Ba = 138u$)
44. a) Glycine (b) Valine (c) Leucine (d) Cysteine (e) Arginine (f) Methionine (g) Lysine (h) Tryptophan (i) Alanine
Sulphur containing amino acid = x
Basic amino acid = y
Essential amino acid = z
Find the value $M = x + y + z$
45. The Pka values for 3- Ionisable groups x,y,z of glutamic acid are 4.3, 9.7 & 2.2 respectively.



The isoelectric point for the Aminoacid is

46. The number of chiral carbons in penicillin is



47. Number of carbons in cetyltrimethyl ammonium bromide

SECTION – IV (MATCHING TYPE)

This section contains **FOUR (04)** Matching List Sets.

- Each set has **ONE** Multiple Choice Question.
- Each set has **TWO** lists : **List-I** and **List-II**.
- **List-I** has **Four** entries (I), (II), (III) and (IV) and **List-II** has **Five** entries (P), (Q), (R), (S) and (T).
- **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question.
- Answer to each question will be evaluated according to the following marking scheme :

Full Marks: +3 **ONLY** if the option corresponding to the correct combination 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..

48.

	COLUMN-I		COLUMN-II
I)	Soap	P)	Stearic acid+polyethylene glycol
II)	Anionic detergent	Q)	$C_{17}H_{35}COONa$
III)	Cationic detergent	R)	Sodium lauryl sulphate
IV)	Non ionic detergent	S)	Cetyltrimethyl ammonium bromide

- A) (I) \rightarrow (Q), II \rightarrow (R), (III) \rightarrow (S), (IV) \rightarrow (P)
 B) (I) \rightarrow (Q), II \rightarrow (S), (III) \rightarrow (R), (IV) \rightarrow (P)
 C) (I) \rightarrow (R), II \rightarrow (Q), (III) \rightarrow (S), (IV) \rightarrow (P)
 D) (I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (P), (IV) \rightarrow (Q)

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49.

	COLUMN-I		COLUMN-II
I)	BHT	P)	Butylated hydroxyl toluene
II)	BHA	Q)	Food preservative
III)	C_6H_5COONa	R)	Antioxidants for wine and beer
IV)	Sulphur dioxide and sulphite	S)	Butylated hydroxyl anisole

- A) $(I) \rightarrow (P), II \rightarrow (S), (III) \rightarrow (R), (IV) \rightarrow (Q)$
 B) $(I) \rightarrow (P), II \rightarrow (S), (III) \rightarrow (Q), (IV) \rightarrow (R)$
 C) $(I) \rightarrow (P), II \rightarrow (R), (III) \rightarrow (Q), (IV) \rightarrow (P)$
 D) $(I) \rightarrow (Q), II \rightarrow (P), (III) \rightarrow (R), (IV) \rightarrow (S)$

50.

	COLUMN-I		COLUMN-II
I)		P)	β -D-fructopyranose
II)		Q)	α -D-fructopyranose
III)		R)	α -D-glucopyranose
IV)		S)	β -D-glucopyranose

- A) $(I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (Q), (IV) \rightarrow (P)$
 B) $(I) \rightarrow (Q), II \rightarrow (S), (III) \rightarrow (R), (IV) \rightarrow (P)$
 C) $(I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (P), (IV) \rightarrow (Q)$
 D) $(I) \rightarrow (S), II \rightarrow (R), (III) \rightarrow (P), (IV) \rightarrow (Q)$

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51.

	COLUMN-I		COLUMN-II
I)	Ammonical $AgNO_3$	P)	Detect or confirm the position of double bonds
II)	$NaOH / I_2$	Q)	Presence of strongly acidic groups
III)	$NaHCO_3$	R)	Presence of acetylinic group or- CHO group
IV)	Ozonolysis	S)	Presence of $\begin{array}{c} -CH - CH_3 \\ \\ OH \end{array}$

A) $(I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (P), (IV) \rightarrow (Q)$ B) $(I) \rightarrow (P), II \rightarrow (R), (III) \rightarrow (Q), (IV) \rightarrow (S)$ C) $(I) \rightarrow (P), II \rightarrow (Q), (III) \rightarrow (S), (IV) \rightarrow (T)$ D) $(I) \rightarrow (R), II \rightarrow (S), (III) \rightarrow (Q), (IV) \rightarrow (P)$

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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

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ALL INDIA CATEGORY
RANKS COUNT

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