Sri Chaitanya IIT Academy.,India.

A.P T.S KARNATAKA TAMILNADU MAHARASTRA DELHI RANCHI

A right Choice for the Real Aspirant

ICON Central Office - Madhapur - Hyderabad

SEC: Sr.Super60_STERLING BT	**JEE-MAIN**	**Date: 20-09-2025**
Time: 09:00AM to 12:00PM	**RPTM-07**	**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:** _____

20-09-25_Sr.Super60_STERLING BT_Jee-Main_RPTM-07_Test Syllabus

MATHEMATICS : 3D and Vectors

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

CHEMISTRY : 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: Drugtarget 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
(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. If the position vector of the points A,B,C and D be $5\hat{i}+5\hat{j}+2\lambda\hat{k}, \hat{i}+2\hat{j}+3\hat{k},$ $-2\hat{i}+\lambda\hat{j}+4\hat{k}$ *and* $-\hat{i}+5\hat{j}+6\hat{k}$ Let the set $S=\{\lambda\in\mathbb{R}: the\ points\ A,B,C\ and\ D\ are\ coplanar\}$. Then $\sum_{\lambda\in S}(\lambda+2)^2$ is equal to

1) 25 2) $\frac{37}{2}$ 3) 14 4) 41

2. Let $\vec{a}=\alpha\hat{i}+2\hat{j}-\hat{k}$ *and* $\vec{b}=-2\hat{i}+\alpha\hat{j}+\hat{k}$ *where* $\alpha\in R$. If the area of the parallelogram whose adjacent sides are represented by the vectors $\vec{a}$ *and* $\vec{b}$ *is* $\sqrt{15(\alpha^2+4)}$, then the vale of $2|\vec{a}|^2+(\vec{a}.\vec{b})|\vec{b}|^2$ is equal to

1) 10 2) 7 3) 9 4) 14

3. Let $\vec{a}=\hat{i}+\hat{j}+\sqrt{2}\hat{k}, \vec{b}=b_1\hat{i}+b_2\hat{j}+\sqrt{2}\hat{k}$ *and* $\vec{c}=5\hat{i}+\hat{j}+\sqrt{2}\hat{k}$ be three vector such that the projection vector of $\vec{b}$ *on* $\vec{a}$ *is* $|\vec{a}|$ *and* $\vec{a}+\vec{b}$ is perpendicular to $\vec{c}$, *then* $|\vec{b}|$ is equal to:

1) $\sqrt{22}$ 2) $\sqrt{32}$ 3) 6 4) 4

4. Let a vector $\vec{a}$ coplanar with vectors $\vec{b}=2\hat{i}+\hat{j}+\hat{k}$ *and* $\vec{c}=\hat{i}-\hat{j}+\hat{k}$. if $\vec{a}$ is perpendicular to $\vec{d}=3\hat{i}+2\hat{j}+6\hat{k}$ *and* $|\vec{a}|=\sqrt{10}$. then the possible value of $[\vec{a}\ \vec{b}\ \vec{c}]+[\vec{a}\ \vec{b}\ \vec{d}]+[\vec{a}\ \vec{c}\ \vec{d}]$ is equal to :

1) -42 2) -40 3) -29 4) -38

5. Let $\lambda \in \mathbb{R}, \vec{a} = \lambda\hat{i} + 2\hat{j} - 3\hat{k}, \vec{b} = \hat{i} - \lambda\hat{j} + 2\hat{k}$, *if* $\left(\left(\vec{a}+\vec{b}\right)\times\left(\vec{a}\times\vec{b}\right)\times\left(\vec{a}-\vec{b}\right)\right) =$ $8\hat{i} - 40\hat{j} - 24\hat{k}$ then $\left|\lambda\left(\vec{a}+\vec{b}\right)\times\left(\vec{a}-\vec{b}\right)\right|^2$ is equal to

1) 140 2) 132 3) 144 4) 136

6. Let $\vec{a}, \vec{b}$ *and* $\vec{c}$ be three non zero vectors such that $\vec{b}.\vec{c} = 0$ *and* $\vec{a}\times\left(\vec{b}\times\vec{c}\right) = \frac{\vec{b}-\vec{c}}{2}$. *if* $\vec{d}$ be a vector such that $\vec{b}.\vec{d} = \vec{a}.\vec{b}$, then $\left(\vec{a}\times\vec{b}\right).\left(\vec{c}\times\vec{d}\right)$ is equal to

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

7. Let α be the angle between the lines whose direction cosines satisfies the equations $l + m - n = 0$ *and* $l^2 + m^2 - n^2 = 0$. Then the value of $\tan^4\alpha$ *is* :

1) 9 2) 81 3) 27 4) $\frac{1}{9}$

8. The shortest distance between the lines $x + 1 = 2y = -12z$ *and* $x = y + 2 = 6z - 6$ *is*

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

9. If a line L pass through the point (0, 1, 2), intersect the line $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and be parallel to the plane $2x + y - 3z = 4$. Then the distance of the point $p(1, -9, 2)$ from the line L is

1) $\sqrt{74}$ 2) $\sqrt{69}$ 3) $\sqrt{54}$ 4) 9

10. If the two lines $l_1 : \frac{x-2}{3} = \frac{y+1}{-2}, z = 2$ *and* $l_2 : \frac{x-1}{1} = \frac{2y+3}{\alpha} = \frac{z+5}{2}$ are perpendicular, then an angle between the lines l_2 *and* $l_3 : \frac{1-x}{3} = \frac{2y-1}{-4} = \frac{z}{4}$ is

1) $\cos^{-1}\left(\frac{29}{4}\right)$ 2) $\sec^{-1}\left(\frac{29}{4}\right)$ 3) $\cos^{-1}\left(\frac{2}{29}\right)$ 4) $\cos^{-1}\left(\frac{2}{\sqrt{29}}\right)$

11. For real numbers α and $\beta \neq 0$, if the point of intersection of the straight lines

$\frac{x-\alpha}{1}=\frac{y-1}{2}=\frac{z-1}{3}$ and $\frac{x-4}{\beta}=\frac{y-6}{3}=\frac{z-7}{3}$ lies on the plane $x+2y-z=8$,

then $\alpha-\beta$ is equal to:

1) 5 2) 9 3) 3 4) 7

12. The line $x=ay-1=z-2$ and $x=3y-2=bz-2,(ab\neq 0)$ are coplanar, if:

1) $b=1, a\in R-\{0\}$ 2) $a=1, b\in R-\{0\}$ 3) $a=2, b=2$ 4) $a=2, b=3$

13. Match the following

Coloumn I	Column II
A. $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and $\frac{x-1}{3}=\frac{y-3}{4}=\frac{z-5}{5}$	p. coincident
B. $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and $\frac{x-3}{2}=\frac{y-5}{3}=\frac{z-7}{4}$	q. parallel and different
C. $\frac{x-2}{5}=\frac{y+3}{4}=\frac{5-z}{2}$ and $\frac{x-7}{5}=\frac{y-1}{4}=\frac{z-2}{-2}$	r. skew
D. $\frac{x-3}{2}=\frac{y+2}{3}=\frac{z-4}{5}$ and $\frac{x-3}{3}=\frac{y-2}{2}=\frac{z-7}{5}$	s. intersecting in a point

1) (A) → (s) , (B) → (p), (C) → (q), (D) → (r) 2) (A) → (p) , (B) → (r), (C) → (s), (D) → (q)

3) (A) → (p) , (B) → (q), (C) → (r), (D) → (s) 4) (A) → (r) , (B) → (s), (C) → (q), (D) → (p)

14. Let P and Q be the points on the line $\frac{x+3}{8}=\frac{y-4}{2}=\frac{z+1}{2}$ which are at a distance of 6 units from the point R(1,2,3). If the centroid of the triangle PQR is (α,β,λ), then $\alpha^2+\beta^2+\lambda^2$ is :

1) 26 2)36 3) 18 4) 24

15. Let $\overrightarrow{OA}=\vec{a},\overrightarrow{OB}=12\vec{a}+4\vec{b}$ *and* $\overrightarrow{OC}=\vec{b}$, where O is the origin. If S is the parallelogram with adjacent sides OA and OC , then

$\frac{area\ of\ the\ quadrilateral\ OABC}{area\ of\ S}$ is equal to _____

1) 6 2) 10 3) 7 4) 8

16. The set of all α for which the vectors $\vec{a}=\alpha t\hat{i}+6\hat{j}-3\hat{k}$ and $\vec{b}=t\hat{i}-2\hat{j}-2\alpha t\hat{k}$ are inclined at an obtuse angle for all t $\in R$, is

1) $\left(-\frac{4}{3},1\right)$ 2) [0,1) 3) $(\frac{-4}{3},0]$ 4) (-2,0]

17. l_1, m_1,n_1 and l_2,m_2,n_2 are direction cosines of the two lines inclined to each other at an angle θ, then the direction cosines fo the internal besector of the angle between these lines are

1) $\frac{l_1+l_2}{2\sin\frac{\theta}{2}},\frac{m_1+m_2}{2\sin\frac{\theta}{2}},\frac{n_1+n_2}{2\sin\frac{\theta}{2}}$

2) $\frac{l_1+l_2}{2\cos\frac{\theta}{2}},\frac{m_1+m_2}{2\cos\frac{\theta}{2}},\frac{n_1+n_2}{2\cos\frac{\theta}{2}}$

3) $\frac{l_1-l_2}{2\sin\frac{\theta}{2}},\frac{m_1-m_2}{2\sin\frac{\theta}{2}},\frac{n_1-n_2}{2\sin\frac{\theta}{2}}$

4) $\frac{l_1-l_2}{2\cos\frac{\theta}{2}},\frac{m_1-m_2}{2\cos\frac{\theta}{2}},\frac{n_1-n_2}{2\cos\frac{\theta}{2}}$

18. A vector $\vec{v}$ in the first octant is inclined to the x axis at 60°, to the y – axis at 45° and to then z-axis at an acute angle. If a plane passing through the point $\left(\sqrt{2},-1,1\right)and(a,b,c)$ is normal to $\vec{v}$, then

1) $\sqrt{2}a+b+c=1$ 2) $a+b+\sqrt{2}c=1$

3) $a+\sqrt{2}b+c=1$ 4) $\sqrt{2}a-b+c=1$

19. Let ABCD be a quadrilateral . If E and F are the mid points of the diagonals AC and BD respectively and $\left(\overrightarrow{AB}-\overrightarrow{BC}\right)+\left(\overrightarrow{AD}-\overrightarrow{DC}\right)=k\overrightarrow{FE}$, then k is equal to

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

20. Let ABC be a triangle such that $\overrightarrow{BC}=\vec{a},\overrightarrow{CA}=\vec{b},\overrightarrow{AB}=\vec{c},\left|\vec{a}\right|=6\sqrt{2},\left|\vec{b}\right|=2\sqrt{3}$ and $\vec{b}.\vec{c}=12$ consider the statement:

Statement-I : $\left|\left(\vec{a}\times\vec{b}\right)+\left(\vec{c}\times\vec{b}\right)\right|-\left|\vec{c}\right|=6(2\sqrt{2}-1)$

Statement-II : $\angle ACB=\cos^{-1}\left(\sqrt{\frac{2}{3}}\right)$. *Then*

1) Both Statement-I and Statement-II are true

2) Only Statement-I is true

3) Only Statement-II is true

4) Both Statement-I and Statement-II are false

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 $\vec{a},\vec{b},\vec{c}$ be three vectors such that $\left|\vec{a}\right|=\sqrt{31},4\left|\vec{b}\right|=\left|\vec{c}\right|=2$ and $2\left(\vec{a}\times\vec{b}\right)=3\left(\vec{c}\times\vec{a}\right)$.

If the angle between $\vec{b}$ *and* $\vec{c}$ *is* $\frac{2\pi}{3}$, then $\left(\frac{\vec{a}\times\vec{c}}{\vec{a}.\vec{b}}\right)^2$ is equal to ____.

22. Let a line passing through the point (-1,2,3) intersect the lines

$L_1:\frac{x-1}{3}=\frac{y-2}{2}=\frac{z+1}{-2}$ *at* $M(\alpha,\beta,\gamma)$ *and* $L_2:\frac{x+2}{-3}=\frac{y-2}{-2}=\frac{z-2}{4}$ *at* $N(a,b,c)$.

Then the value of $\alpha+\beta+\gamma+a+b+c$ *equals* _____

23. If the shortest distance between the lines

$\vec{r_1} = \alpha\hat{i} + 2\hat{j} + 2\hat{k} + \lambda(\hat{i} - 2\hat{j} + 2\hat{k}), \lambda \in R, \alpha < 0$

$\vec{r_2} = -4\hat{i} - \hat{k} + \mu(3\hat{i} - 2\hat{j} - 2\hat{k}), \mu \in R$ is 9, then α is equal to_____.

24. A line l passing through origin is perpendicular to the lines

$l_1 : \vec{r} = (3+t)\hat{i} + (-1+2t)\hat{j} + (4+2t)\hat{k}$, $l_2 : \vec{r} = (3+2s)\hat{i} + (3+2s)\hat{j} + (2+s)\hat{k}$

If the co- ordinates of the point in the first octant on l_2 at a distance of $\sqrt{17}$ from the point of intersection of l and l_1 are (a,b,c) then 18(a+b+c) is equal to _____

25. If the distance of the point Q(0,2,-2) form the line passing through the point P(5,-4,3) and Perpendicular to the lines $\vec{r} = (-3\hat{i} + 2\hat{k}) + \lambda(3\hat{i} + 2\hat{j} + 5\hat{k}), \lambda \in \mathbb{R}$

and $\vec{r} = (\hat{i} - 2\hat{j} + 2\hat{k}) + \mu(-\hat{i} + 3\hat{j} + 2\hat{k}), \mu \in \mathbb{R}$ is p , then p^2 is _____

PHYSICS **Max Marks: 100**

SECTION-I (SINGLE CORRECT ANSWER TYPE)

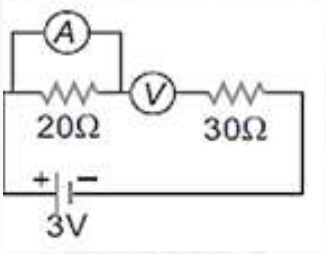
This section contains **20 Multiple Choice Questions.** Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

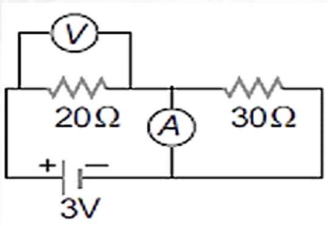
Marking scheme: +4 for correct answer, 0 if not attempted and –1 in all other cases.

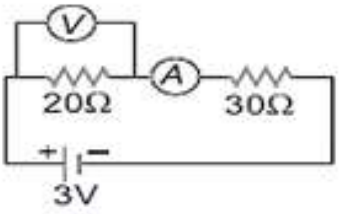
26. Resistance of a resistor at temperature t°C is $R_t = R_o(1+\alpha t+\beta t^2)$ here R_o is the resistance At 0 °C. The temperature coefficient of resistance at temperature at t °C is

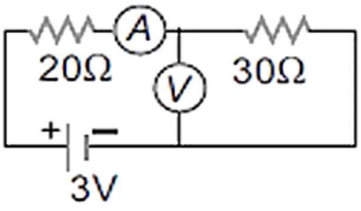
1) $\frac{(1+\alpha t+\beta t^2)}{\alpha+2\beta t}$ 2) $(\alpha+2\beta t)$ 3) $\frac{\alpha+2\beta t}{(1+\alpha t+\beta t^2)}$ 4) $\frac{(\alpha+2\beta t)}{2(1+\alpha t+\beta t)}$

27. Resistors of resistance 20 Ω and 30 Ω are joined in series with a battery of emf 3V. It is desired to measure current and voltage across the 20 Ω resistor with the help of an ammeter and voltmeter. Identify the correct arrangement of ammeter (A) and voltmeter (V) out of four possible arrangements shown in figure. Given below

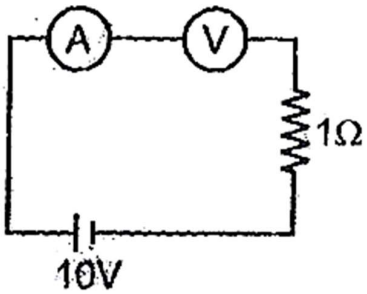
1) 

2) 

3) 

4) 

28. In the shown figure .



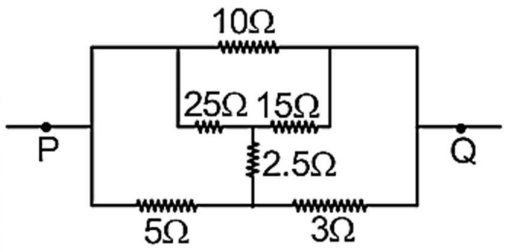
1) If both ammeter and voltmeter are ideal, then reading of ammeter is zero, reading of voltmeter is less than 10V

2) If both ammeter and voltmeter are ideal, then reading of ammeter is 10A, reading of voltmeter is 0V

3) If ammeter is non ideal, voltmeter is ideal, the reading of ammeter is slightly less than 10A, reading of voltmeter is 10V

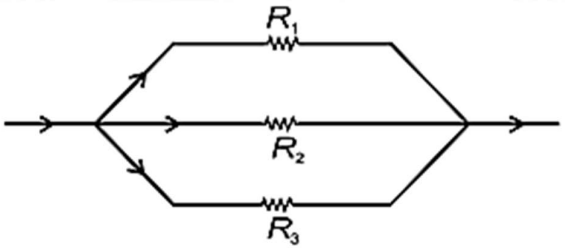
4) If ammeter is ideal, voltmeter is non ideal, then reading of ammeter is less than 10A, reading of voltmeter is less than 10V

29. If a battery of emf of 8V and negligible internal resistance is connected between terminals P and Q of the circuit shown in figure, calculate the current through 2.5 Ω Resistance.



1) 2A 2) 3A 3) 4A 4) Zero

30. In the situation shown, resistances R_1, R_2 and R_3 are in the ratio 3 : 2 : 1



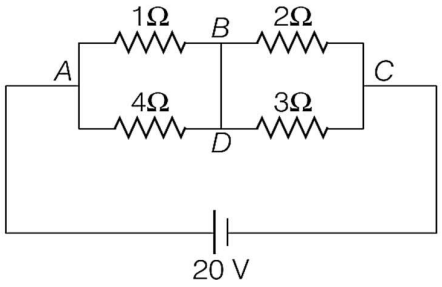
1) The currents through R_1, R_2 and R_3 are in the ratio 1 : 2 : 3

2) The rate of heat production in R_1, R_2 and R_3 are in the ratio 1 : 2 : 3

3) The potential differences across R_1, R_2 and R_3 are in the ratio 3 : 2 : 1

4) The rate of power consumption in R_1, R_2 and R_3 are in the ratio 2 : 3 : 6

31. In the given circuit diagram, a wire is joining points B and D. The current in this wire is



1) Zero 2) 2 A 3) 0.4 A 4) 4 A

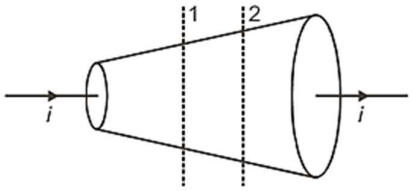
32. A resistance of 2 Ω is connected across one gap of a meter bridge (the length of the wire is 100 cm) and an unknown resistance, greater than 2 Ω, is connected across the other gap. When these resistances are interchanged, the balance point shifts by 20 cm. Neglecting any corrections, the unknown resistance is

1) 3 Ω 2) 4 Ω 3) 5 Ω 4) 6 Ω

33. Current in a resister R uniformly decreases from some value to zero in time Δt. Total charge that crosses the cross section is q. Heat generated in the resistance during this process is

1) $\frac{4}{3}\frac{q^2R}{\Delta t}$ 2) $\frac{2}{3}\frac{q^2R}{\Delta t}$ 3) $\frac{3}{4}\frac{q^2R}{\Delta t}$ 4) $\frac{3}{2}\frac{q^2R}{\Delta t}$

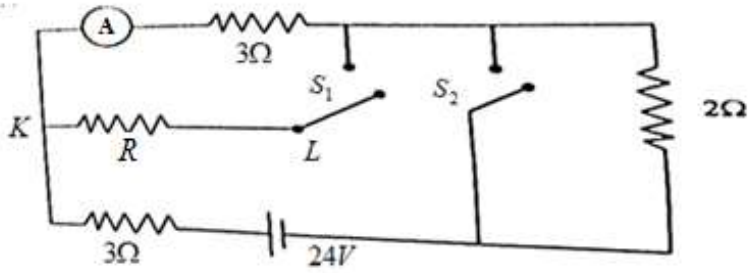
34. A constant Current *i* is following through a wire of non-uniform cross-section as shown. Match the following columns.



Column – I	Column – II
A) Current density	p) More at section 1 than 2
B) Electric field	q) More at section 2 than 1
C) Resistance per unit length	r) Same at both sections 1 and 2
D) Potential difference per unit length	s) Data insufficient

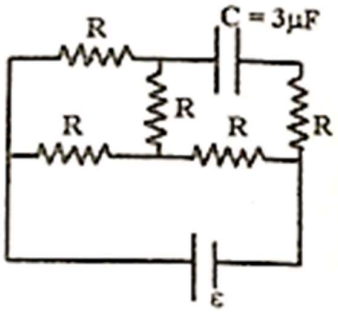
1) A→P, B→P, C→P, D→P 2) A→P, B→S, C→S, D→S
3) A→q, B→q, C→q, D→q 4) A→r, B→r, C→p, D→q

35. In the circuit shown in the figure, the ideal ammeter reading for current is taken
(a) With both switches open (b) With both switches closed.
The readings are the same in both cases. The value of resistance R is



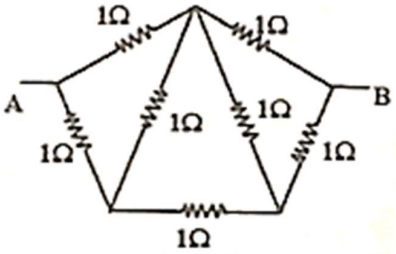
1) 2 Ω 2) 3 Ω 3) 4.5 Ω 4) 7.5 Ω

36. In the given circuit, the potential difference across the capacitor is 12 V. Each resistance is of 3 Ω. The cell is ideal. The emf of the cell is



1) 15 V 2) 9 V 3) 12 V 4) 24 V

37. Find effective resistance between A & B.



1) 2 Ω 2) 1 Ω 3) 8/7 Ω 4) 6/5 Ω

38. Statement – I : In an isolated conductor, velocity of an electron is zero, hence they are in rest condition as no electric field is applied.
Statement – II : Drift velocity becomes double and hence due to this, mobility of electron will also get doubled.
1) Both statements are false
2) Both statements are true
3) Statement – I is false and statement – II is true
4) Statement – I is true and statement – II is false

39. Assertion (A) : When constant current is passing through a conductor of variable area of cross-section, the electric field inside conductor is inversely proportional to cross sectional area.

Reason (R): Microscopic form of Ohm's law $\vec{E} = \rho\vec{J}$. Where $\vec{E}$ stands for electric field, ρ stands for resistivity and $\vec{J}$ stands for current density.

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

40. Statement I: Higher the range, the greater is the resistance of the ammeter.
Statement II: To increase the range of the ammeter, an additional shunt needs to be used across it.

1) Statement I is true, Statement II is true; Statement II is the correct explanation for Statement I
2) Statement I is true, Statement II is true; Statement II is not a correct explanation for Statement I
3) Statement I is true; Statement II is false
4) Statement I is false; Statement II is true

41. Statement – 1 : When identical cells are connected in parallel to the external load, the effective emf increases.
Statement – 2 : All the identical cells are connected in parallel will be sending unequal current to the external load in the same direction.

1) Both statements are false
2) Both statements are true
3) Statement – I is false and statement –II is true
4) Statement –I is true and statement –II is false

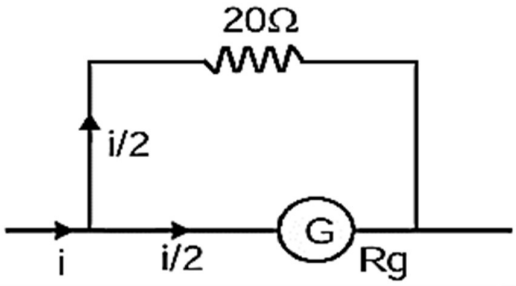
42. Space between two concentric conducting spheres of radii a and b (b>a) is filled with a medium of resistivity ρ. The resistance between the two spheres (in ohm) will be

1) $\frac{\rho}{2\pi}\left(\frac{1}{a}+\frac{1}{b}\right)$ 2) $\frac{\rho}{4\pi}\left(\frac{1}{a}-\frac{1}{b}\right)$ 3) $\frac{\rho}{2\pi}\left(\frac{1}{a}-\frac{1}{b}\right)$ 4) $\frac{\rho}{4\pi}\left(\frac{1}{a}+\frac{1}{b}\right)$

43. Power generated across a uniform wire connected across a supply is H. If the wire is cut into n equal parts and all the parts are connected in parallel across the same supply, the total power generated in the wire is

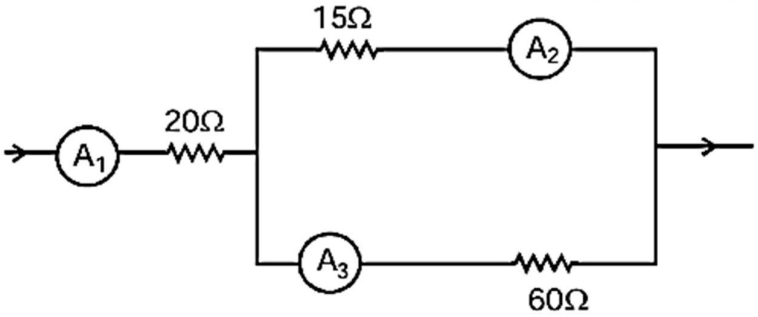
1) H/n^2 2) n^2H 3) nH 4) H/n

44. In a galvanometer, the deflection becomes one-half when the galvanometer is shunted by a 20 Ω resistor. The galvanometer resistance is



1) 5 Ω 2) 10 Ω 3) 40 Ω 4) 20 Ω

45. If the reading of ammeter A_3 in figure is 0.75 A. Neglecting the resistance of the ammeters, the reading of ammeter A_2 will be :



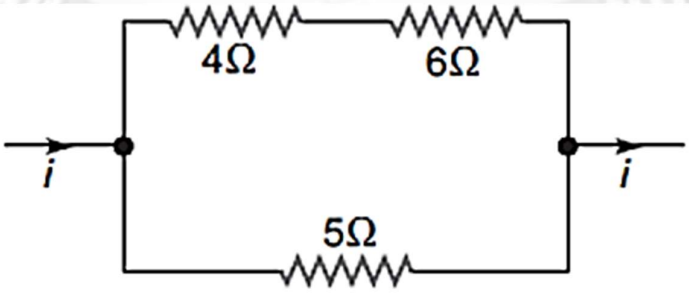
1) 1.5 A 2) 3 A 3) 4.5 A 4) 6 A

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**).

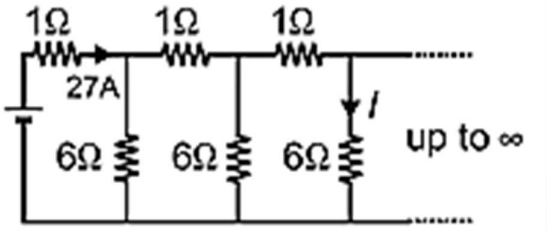
Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases

46. In the circuit shown in figure, the heat produced in the 5 Ω resistor due to the current flowing through it is 100 Js^{-1}. The heat generated in the 4 Ω resistor is (In Js^{-1})

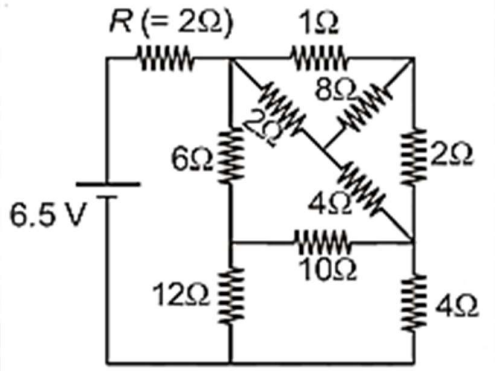


47. In an electric circuit, a cell of certain EMF provides a potential difference of 1.25V across a load resistance of 5Ω. However, it provides a potential difference of 1 V across a load resistance of 2Ω. The emf of the cell is given by x/10 V. Then, the value of x is

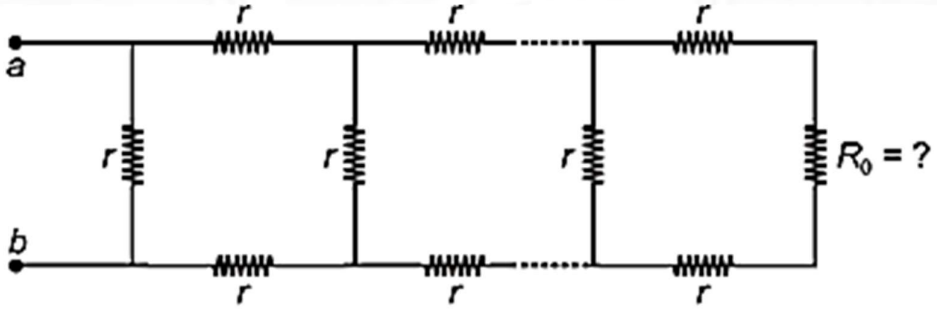
48. Consider the infinite ladder circuit shown. What is the value of current I (in A) shown in one of the 6 Ω resistors?



49. In the following circuit, the current through the resistor R (= 2 Ω) is I amperes. The value of I is



50. In the circuit shown there are n repetitions of the same loop. What resistance R_0 should be connected across the end points so that the equivalent resistance between a and b may be independent of n? If your answer is $R_0=(\sqrt{P}-1)r$ then value of 'P' is



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. Lactose is a disaccharide of

1) α -D-glucose and α -D-Fructose 2) β -D-glucose and β -D-Fructose

3) α -D-glucose and β -D-Ribose 4) α -D glucose and β -D-Galactose

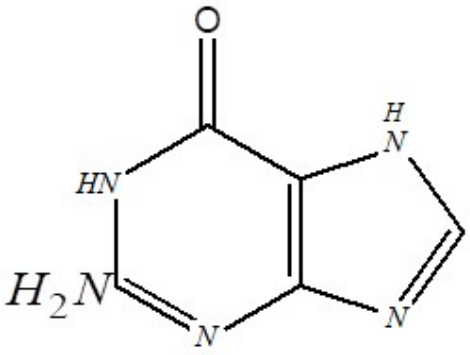
52. Which of the following sets of vitamins is fat soluble

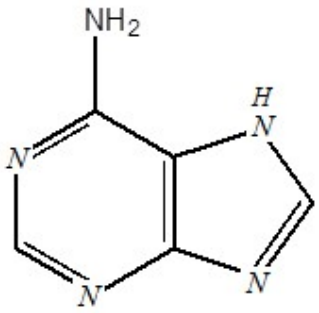
1) D,B_1, B_2, E 2) C, D, B_6, B_{12} 3) A, D, E, K 4) A, D, B_1, B_2

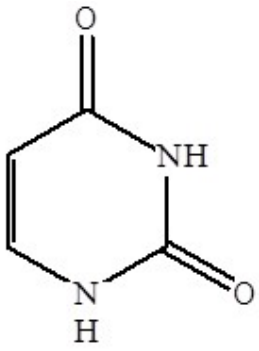
53. The number of hydrogen bonds between Guanine and cytosine; and between adenine and thymine in DNA is

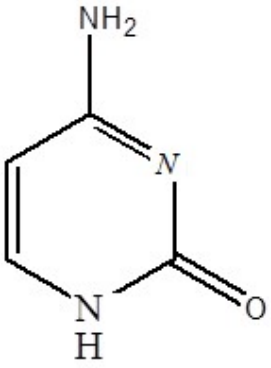
1) 1, 2 2) 3, 2 3) 3, 1 4) 2, 1

54. The base present in cytidine is

1) 

2) 

3) 

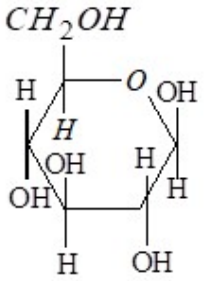
4) 

55. FRUCTOSE $\xrightarrow[2.P/HI]{1.HCN/H_3O^+} A.\ Ais$

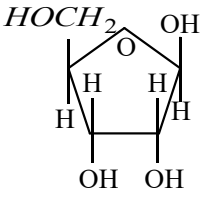
1) n-heptanoic acid 2) 2-methyl hexanoic acid

3) n-heptane 4) 2-methyl hexane

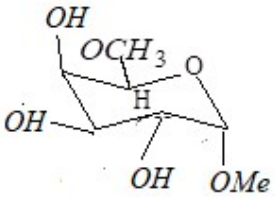
56. Which of the following compound will show mutarotaion



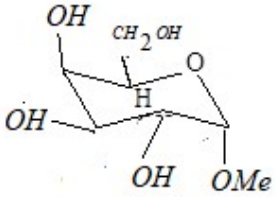
A)



B)



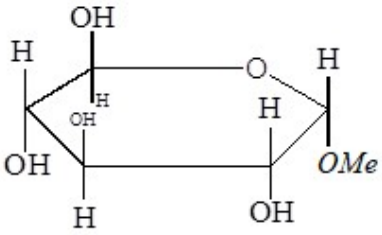
C)



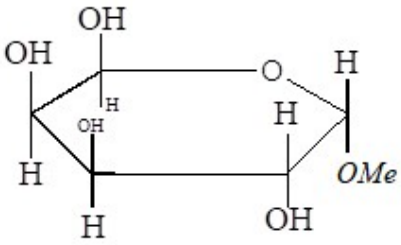
D)

1) AB 2) CD 3) AC 4) AD

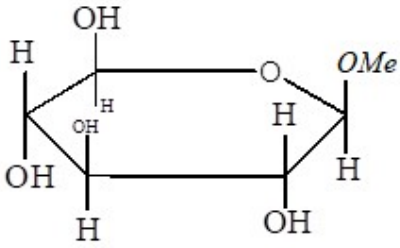
57.



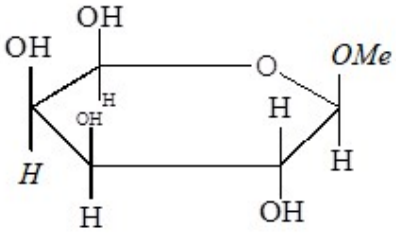
1)



2)



3)



4)

The correct option is

1) I & II are anomers, III and IV are epimers
2) I & III are epimers, II & IV are anomers
3) I & II are epimers, III & IV are anomers
4) I & III are anomers, I & II are epimers

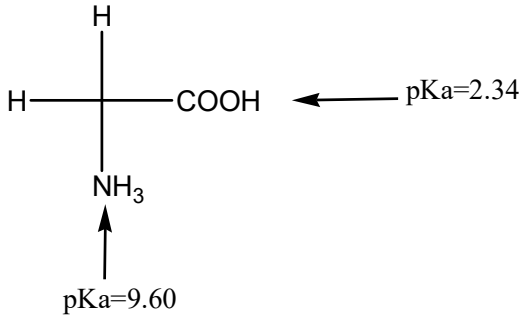
58. The optical rotation of α - form of a pyranose is + 150.7^0 ,that of the β -form is 52.8^0 .The percentage of the α -form in equilibrium mixture is, an equilibrium mixture of these anomers has an optical rotation of $+80.2^0$

1) 28 % 2) 32 % 3) 68 % 4) 72 %

59. A decapeptide (MWt 796) on complete hydrolysis gives glycine (MWt 75). Alanine and phenylalanine. Glycine contributes 47.0% to the total weight of the hydrolysed products. The no.of glycine units present in the decapeptide is

1) 3 2) 5 3) 6 4) 7

60. What is the pI of glycine? The structure and pKa values are shown below

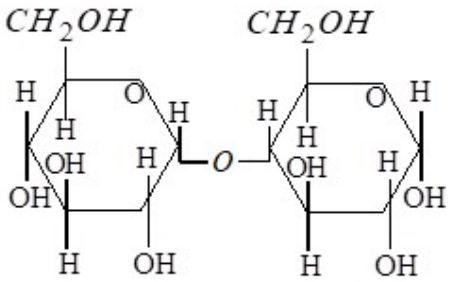


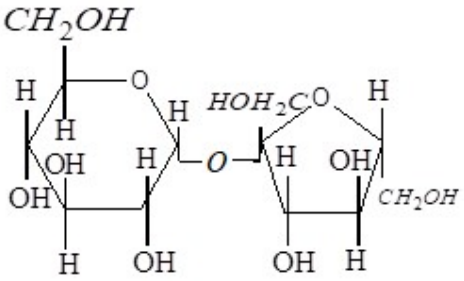
1) 7.26 2) 5.97 3) 3.63 4) 11.94

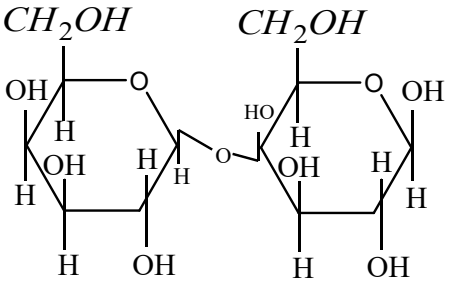
61. Nitric acid is added to sodium extract and boiled before adding silver nitrate to test halogens because

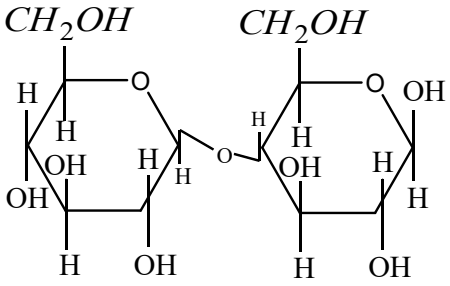
1) To neutralise alkaline solution of sodium fusion extract.
2) To convert sodium cyanide and sodium sulphide into HCN and H_2S which are volatile.
3) To convert sodium cyanide and sodium sulphide into sodium thiocyanate.
4) To get white precipitate of AgCN and black precipitate of Ag_2S

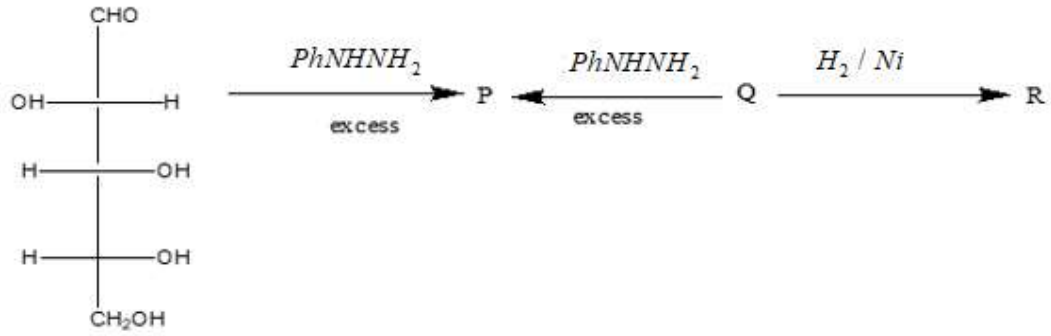
62. In disaccharides, if the reducing groups of monosaccharides i.e. Aldehydic or ketonic groups are bonded, these are non-reducing sugars. Which of the following disaccharide is a non-reducing sugar?

1) 

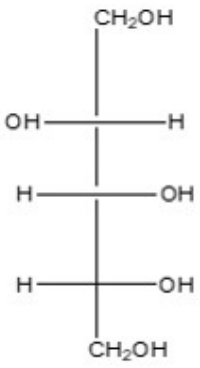
2) 

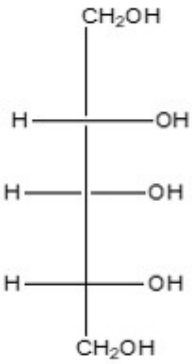
3) 

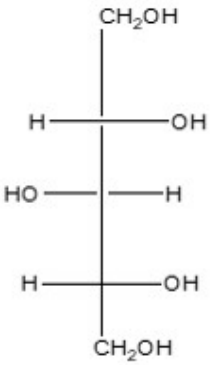
4) 

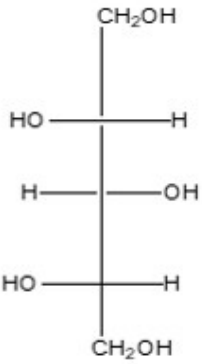
63. 

The structure of 'R' in the above sequence is

1) 

2) 

3) 

4) 

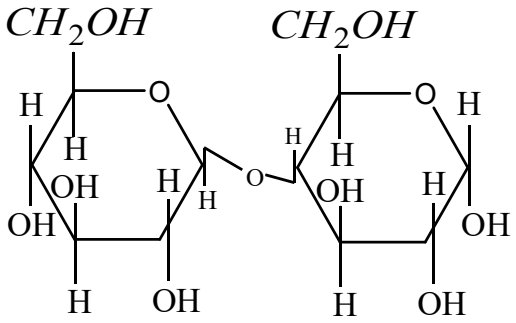
64.

Column -I (Process of purification)	Column -II (Principle involved the process)
A) Crystallization	1) Liquids which are immiscible in water possessing high boiling point, steam volatile.
B) Sublimation	2)The compound should be soluble in the solvent at its boiling temperature
C) Fractional distillation	3) The compound should have high vapour pressure below its melting point
D) Steam distillation	4) Liquids which has Boiling point difference less than 40^0C

1) A-2, B-3, C-4, D-1 2) A-2, B-3, C-1, D-4
3) A-4, B-2, C-1, D-3 4) A-3, B-2, C-4, D-1

65. Statement-I: D(+) - glucose is dextrorotatory in nature.
Statement-II: 'D' represents its dextrorotatory nature.
1) Both Statement-I and Statement-II are true and Statement-II is the correct explanation for Statement-I
2) Both Statement-I and Statement-II are true and but Statement-II is the not correct explanation for Statement-I.
3) Statement-I is true but Statement-II is false
4) Statement-I is false but Statement-II is true

66. Assertion: β -glycosidic linkage is present in maltose,



Reason**:** Maltose is composed of two glucose units in which C-1 of one glucose unit is linked to C-4 of another glucose unit.
1) Both A and R are true and statement R is the correct explanation for A
2) Both A and R are true and but R is the not correct explanation for A.
3) A is true but R is false
4) A is false but R is true

67. Statement-I: All naturally occuring α - aminoacids except glycine are optically active.
Statement-II: Most naturally occuring amino acids have L - configuration.
1) Both Statement-I and Statement-II are true and Statement-II is the correct explanation for Statement-I
2) Both Statement-I and Statement-II are true and but Statement-II is the not correct explanation for Statement-I.
3) Statement-I is true but Statement-II is false
4) Statement-I is false but Statement-II is true

68. Assertion (A) : A mixture of plant pigments can be separated by chromatogrphy.

Reason (R) : Chromatography is used for the separation of coloured substances into individual components.

1) If both A and B are true and the R is the correct explanation of the A.

2) If both A and R are true but R is not the correct explanation of the A.

3) If A is true but R is false.

4) If A is false but R is true.

69. In the Lassaigne's test for nitrogen in an organic compound, the Prussian blue colour is obtained due to the formation of:

1) $Na_4[Fe(CN)_6]$ 2) $Fe_4[Fe(CN)_6]_3$ 3) $Fe_2[Fe(CN)_6]$ 4) $Fe_3[Fe(CN)_6]_4$

70. Thiol group is present in

1) Tryptophan 2) Cysteine 3) Methionine 4) Cytosine

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 moles of HIO_4 required by complete oxidation of one mole of glucose is

72. How many of the following reagents are useful to distinguish between benzaldehyde and acetophone?

Tollen's reagent, Fehling's solution, Benedict's solution, I_2 and NaOH

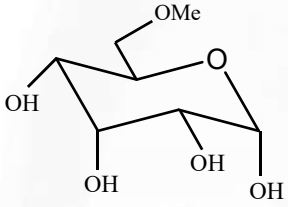
73. If Weight percent of Nitrogen in Glucosazone is X, Then the value of 2X is?

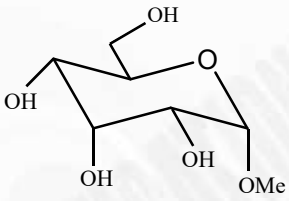
74. Consider the following reaction:

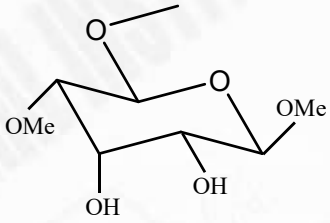
i)	$Glucose + ROH \xrightarrow{dry\ HCl} Acetal \xrightarrow[(CH_3CO)_2O]{x.eq.of} Acetyl\ derivative$
ii)	$Glucose \xrightarrow{Ni/H_2} A \xrightarrow[(CH_3CO)_2O]{y.eq.of} Acetyl\ derivative$
iii)	$Glucose \xrightarrow[(CH_3CO)_2O]{z.eq.of} Acetyl\ derivative$

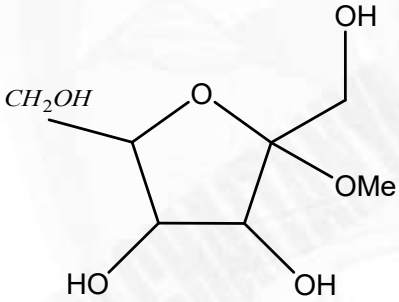
Find the value of $\left(\frac{x+y}{z}\right) =$

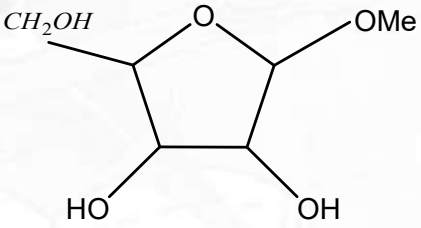
75. The number of reducing sugars among the following is?

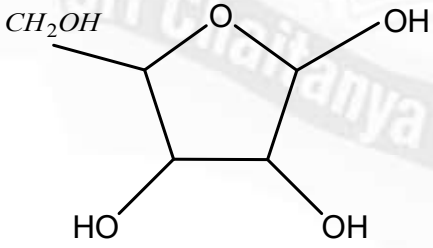


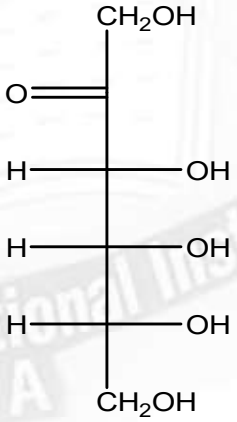












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JEE MAIN 2025

31 STUDENTS BELOW 100 AIR

VANGALA AJAY REDDY
APP. NO. 250310255192
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