



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

Time: 09:00AM to 12:00PM

JEE-MAIN

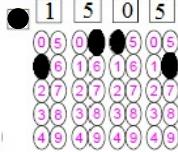
WTM-39

Date: 26-07-2025

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 or make any stray marks on the Answer Sheet**

Name of the Candidate (in Capital): _____

Admission Number:

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Candidate's Signature: _____

Invigilator's Signature: _____



26-07-25_Sr.Super60_STERLING BT_Jee-Main_WTM-39_Test Syllabus

MATHEMATICS : Conditional probability, Multiplication theorem, Independent events, Total probability theorem, Baye's Theorem ,Random Variables

PHYSICS : NUCLEI: Nuclear notation, Composition of nucleus, Mass of nucleus, Mass-energy equivalence relation, Size of nucleus, Density of nucleus, Charge of nucleus, Nuclear shapes, Isotopes, Isobars and Isotones, Nuclear binding energy and mass defectNUCLEI: Binding energy curve, Nuclear force and its comparison with gravitational and electrostatic forces, Nature of nuclear force, Variation of nuclear force with distance, NUCLEI: Packing fraction (Optional), Nuclear StabilityNUCLEI: Radioactivity, Three types of radiations, Radioactivity decay law, Half-life period: Half life, $T_1/2$, Average life: Mean life, Decay rate: ActivityNUCLEI: Alpha decay, Theory and energy distribution, Velocity of alpha-particle emitted during radioactivity decay (Optional), Beta decay: Theory and energy distribution, Positron emission, Electron capture, Gamma decay: Theory and energy distribution (Deleted pertaining to JEE MAINS but still in JEE ADV Syllabus)NUCLEI: Radioactivity decay series, Radioactivity dating (Deleted pertaining to JEE MAINS but still in JEE ADV Syllabus), Nuclear reactions, Discovery of neutron, Mass of neutron, Pair production and Pair annihilation, Artificial radioactivity, Nuclear energy, Nuclear fission, Nuclear fusion processes, Nuclear power reactor

CHEMISTRY : Tests for Amines and nitro compounds, Principles of separation of organic compounds by solvent extraction method,BIOMOLECULES: Carbohydrates: Classification; Mono- and di saccharides (glucose and sucrose); Oxidation; Reduction; Glycoside formation and hydrolysis of disaccharides (sucrose, maltose, lactose); Anomers. Tests for carbohydrates, Reactions of glucose with HIO_4 , PhNNH_2 , Amino acids, Proteins, Peptide linkage ,structure of peptide(primary and secondary), types of proteins(fibrous and globular)

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



**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. Let A and B are two independent events such that their probabilities are $\frac{3}{10}$ and $\frac{2}{5}$ respectively. The probability of exactly one of the events happening, is
 1) $\frac{23}{50}$ 2) $\frac{1}{2}$ 3) $\frac{31}{50}$ 4) $\frac{10}{31}$
2. A coin is tossed 7 times. Each time a man calls head. Find the Probability that he wins the toss on more occasions
 1) $\frac{1}{4}$ 2) $\frac{5}{8}$ 3) $\frac{1}{2}$ 4) $\frac{3}{8}$
3. A coin is tossed n times. The probability of getting at least one head is greater than that of getting at least two tails by $\frac{5}{32}$. Then n is:
 1) 5 2) 10 3) 15 4) 8
4. Three urns A, B and C contain 7 red, 5 black; 5 red, 7 black and 6 red, 6 black balls respectively. One of the urns is selected at random and a ball is drawn from it. If the ball drawn is black, then the probability that it is drawn from urn A is:
 1) $\frac{4}{17}$ 2) $\frac{5}{16}$ 3) $\frac{5}{18}$ 4) $\frac{7}{18}$
5. Out of 60% of female and 40% male candidates appearing in an exam, 60% candidates qualify it. The number of females qualifying the exam is twice the number of males qualifying it. A candidate is randomly chosen from the qualified candidates. The probability, that the chosen candidate is a female, is _____
 1) $\frac{2}{3}$ 2) $\frac{11}{16}$ 3) $\frac{23}{32}$ 4) $\frac{1}{16}$
6. A person throws two fair dice. He wins 15 rupees for throwing a doublet (same numbers on the two dice), wins 12 rupees when the throw results in the sum of 9 and loses 6 rupees for any other outcome on the throw. Then the expected gain or loss of the person is
 1) $\frac{1}{2}$ gain 2) $\frac{1}{4}$ gain 3) $\frac{1}{2}$ loss 4) 2 gain

**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 APPL. NO. 202201045309 CUT-OFF 12th Class 300 300 MARKS	RANK 1	JEE Advanced 2023 VARILALA CHIVILAS REDDY APPL. NO. 202201045309 CUT-OFF 12th Class 341 360 MARKS	RANK 1	NEET 2023 BORA VARUN CHAKRAVARTHI APPL. NO. 202201045309 CUT-OFF 12th Class 720 720 MARKS	RANK 1
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7. In a game two players A and B take turns in throwing a pair of fair dice starting with player A and total of scores on the two dice, in each throw is noted. A wins the game if he throws a total of 6 before B throws a total 7 and B wins the game, if he throws a total of 7 before A throws a total 6. The game stops as soon as either of players wins. The probability of A winning the game is

1) $\frac{31}{61}$ 2) $\frac{30}{61}$ 3) $\frac{5}{31}$ 4) $\frac{5}{6}$

8. A bag contains 6 balls. Two balls are drawn from it at random and both are found to be black, the probability that the bag contains at least 5 black balls is

1) $\frac{5}{7}$ 2) $\frac{2}{7}$ 3) $\frac{5}{6}$ 4) $\frac{3}{7}$

9. Let E and F be two independent events the probability that both E and F happen is $\frac{1}{12}$

and the probability that neither E nor F happens is $\frac{1}{2}$ then value of $\frac{P(E)}{P(F)} =$

1) $\frac{1}{3}$ 2) $\frac{5}{12}$ 3) $\frac{3}{2}$ 4) $\frac{4}{3}$ or $\frac{3}{4}$

10. A pack of cards has one card missing. Two cards are drawn randomly and are found to be spades. The probability that the missing card is not a spade is _____

1) $\frac{3}{4}$ 2) $\frac{52}{867}$ 3) $\frac{39}{50}$ 4) $\frac{22}{425}$

11. A fair die is tossed until six is obtained on it. Let X be the number of required tosses, then the conditional probability $p(x \geq 5 / x > 2)$ is _____

1) $\frac{125}{216}$ 2) $\frac{11}{36}$ 3) $\frac{5}{6}$ 4) $\frac{25}{36}$

12. Let A and B be two events such that $P(B/A) = \frac{2}{5}$, $P(A/B) = \frac{1}{7}$ and $P(A \cap B) = 1/9$

Consider Statement I: $P(\bar{A} \cup B) = 5/6$

Statement II: $P(\bar{A} \cap \bar{B}) = 1/18$ then,

- 1) Both statement I and statement II are true
- 2) Both statement I and statement II are false
- 3) Only statement I is true
- 4) Only statement II is true

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

JEE MAIN
2023

SINGARAJU
VERKAT KOUNDINYA
APPL. NO. 20220104349
CUT-OFF 12th Class
300
300
MARKS



RANK

JEE Advanced
2023

VARILALA
CHIVILAS REDDY
APPL. NO. 20220104204
CUT-OFF 12th Class
341
360
MARKS



RANK

NEET
2023

HORA VARUN
CHAKRAVARTHI
APPL. NO. 20220104217
CUT-OFF 12th Class
720
720
MARKS



RANK



13. Let the sum of the two positive integers be 24. If the probability, that their product is not less than $\frac{3}{4}$ times their greatest possible product is $\frac{m}{n}$, where g c d (m, n) = 1,

Then $n - m =$

- 1) 8 2) 10 3) 11 4) 9

14. A random variable X has the following probability distribution

X	0	1	2	3	4
P(X)	K	2k	4k	6k	8k

The value of $P\left(\frac{1 < x < 4}{x \leq 2}\right)$ is equal to

- 1) $\frac{4}{7}$ 2) $\frac{2}{3}$ 3) $\frac{3}{7}$ 4) $\frac{6}{7}$

15. 'n' whole numbers are randomly chosen and multiplied,

Now match the following columns

	Column-I		Column-II
a)	The probability that the last digit is 1,3,7 or 9 is	p)	$\frac{8^n - 4^n}{10^n}$
b)	The probability that the last digit is 2,4,6,8 is	q)	$\frac{5^n - 4^n}{10^n}$
c)	The probability that the last digit is 5 is	r)	$\frac{4^n}{10^n}$
d)	The probability that the last digit is zero is	s)	$\frac{10^n - 8^n - 5^n + 4^n}{10^n}$

- 1) a \rightarrow r; b \rightarrow p; c \rightarrow q; d \rightarrow s 2) a \rightarrow q; b \rightarrow p; c \rightarrow r; d \rightarrow s
 2) a \rightarrow s; b \rightarrow p; c \rightarrow q; d \rightarrow r 4) a \rightarrow r; b \rightarrow p; c \rightarrow s; d \rightarrow q

16. When a missile is fired from a ship ,the probability that it is intercepeted is $\frac{1}{3}$ and the probability that the missile hits the target ,given that it is not intercepeted is $\frac{3}{4}$. If three missiles are fired independently from the ship, then the probability that all three hit the target is

- 1) $\frac{1}{27}$ 2) $\frac{3}{4}$ 3) $\frac{1}{8}$ 4) $\frac{3}{8}$

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IN JEE MAIN 2023 JEE ADVANCED 2023 AND NEET 2023**





17. Three rotten apples are mixed accidentally with seven good apples and four apples are drawn one by one without replacement. Let the random variable X denote the number of rotten apples. If μ and σ^2 represent mean and variance of X respectively, then $10(\mu^2 + \sigma^2)$ is equal to
- 1) 20 2) 250 3) 25 4) 30
18. Let A and B the two independent events such that $P(A) = \frac{1}{3}$ and $P(B) = \frac{1}{6}$ then which of the following is true?
- 1) $P\left(\frac{A}{A \cup B}\right) = \frac{1}{4}$ 2) $P\left(\frac{\bar{A}}{\bar{B}}\right) = \frac{1}{3}$ 3) $P\left(\frac{A}{\bar{B}}\right) = \frac{1}{3}$ 4) $P(A/B) = \frac{2}{3}$
19. A coin is tossed three times, let X denote the number of times a tail follows head if μ and σ^2 denote the mean and variance of X, then the value of $64(\mu + \sigma^2) =$
- 1) 51 2) 48 3) 32 4) 64
20. Two balls are selected at random one by one without replacement from a bag containing 4 white and 6 black balls. If the probability that the first selected ball is black, given that the second selected ball is also black is $\frac{m}{n}$ Where $\text{gcd}(m,n)=1$ then $m+n$ is _____
- 1) 14 2) 4 3) 11 4) 13

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. 25% of the population are smokers. A smoker has 27 times more chances to develop lung cancer than a non-smoker. A person is diagnosed with lung cancer and the probability that this person is a smoker is $k/10$ then $k=$

**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 APPL. NO. 202201000432 CUT-OFF 12 th Class 300 300 MARKS	RANK 1	JEE Advanced 2023 VAVILALA CHIDVILAS REDDY APPL. NO. 202201000424 CUT-OFF 12 th Class 341 360 MARKS	RANK 1	NEET 2023 HORA VARUN CHAKRAVARTHI APPL. NO. 202201000427 CUT-OFF 12 th Class 720 720 MARKS	RANK 1
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22. A fair die is tossed repeatedly until a six is obtained ,let X denote the number of tosses required and let $a = P(X = 3)$, $b = P(X \geq 3)$ and $c = p(X \geq 6 / X > 3)$ then $\frac{b+c}{a} =$

23. In a binomial distribution $B(n, p)$, the sum and product of the mean and variance are 5 and 6 respectively then $6(n + p - q) =$

24. Let there be three independent events E_1, E_2, E_3 .The probability that only E_1 occurs is α , only E_2 occurs is β and only E_3 is occurs is γ . Let p be denote the probability of none of events occur that satisfies the equation $(\alpha - 2\beta)p = \alpha\beta$ and $(\beta - 3\gamma)p = 2\beta\gamma$.

Then $\frac{p(E_1)}{p(E_3)} =$

25. In a tournament a team plays 10 matches with probabilities of winning and losing each match as $\frac{1}{3}$ and $\frac{2}{3}$ respectively. Let x be the number of matches that the team wins and y be the number of matches team loses. If the probability $P(|x - y| \leq 2)$ is P, then $3^9 P =$

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

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

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

26. Which nucleus has the highest binding energy per nucleon?
- 1) ${}_1^2H$
 - 2) ${}_2^4He$
 - 3) ${}_{26}^{56}Fe$
 - 4) ${}_{92}^{238}U$
27. The half-life of a radioactive substance is 10 days. After how many days will only 12.5% of the original sample remain?
- 1) 10 days
 - 2) 20 days
 - 3) 30 days
 - 4) 40 days
28. What is the energy equivalent of 1 amu?
- 1) 931 MeV
 - 2) $1.6 \times 10^{-19} J$
 - 3) $9.31 \times 10^{-19} J$
 - 4) $6.023 \times 10^{23} MeV$
29. A radioactive sample has a decay constant $\lambda = 0.693 day^{-1}$. What is its half-life?
- 1) 1 day
 - 2) 0.5 day
 - 3) 10 days
 - 4) 2 days
30. Nuclear force is:
- 1) strong, long-range
 - 2) strong, short-range
 - 3) weak, long-range
 - 4) weak, short-range
31. The mass of a nucleus in its ground state is always:
- 1) less than the total mass of nucleons
 - 2) greater than the total mass of nucleons
 - 3) equal to the total mass of nucleons
 - 4) total mass of nucleons + electrons
32. Two nuclei have their mass numbers in the ratio 1: 2. What is the ratio of their nuclear densities?
- 1) 1:2
 - 2) 2:1
 - 3) 1:1
 - 4) 1:4
33. Two nuclei A and B have half-lives 10 min and 20 min respectively. If they start with equal number of atoms, find the ratio of decayed atoms of A to B after 60 min.
- 1) 9:8
 - 2) 1:8
 - 3) 8:1
 - 4) 3:8
34. Assertion (A): The half-life of a radioactive substance is independent of its initial amount.
Reason (R): The decay constant depends on the external physical conditions like temperature and pressure.
- 1) Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.
 - 2) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 - 3) Assertion is true, but Reason is false.
 - 4) Assertion is false, but Reason is true.

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





35. Assertion (A): Energy is released during nuclear fission and fusion.
 Reason (R): In both cases, the total mass of the products is less than the total mass of the reactants.
- 1) Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.
 - 2) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 - 3) Assertion is true, but Reason is false.
 - 4) Assertion is false, but Reason is true.
36. Statement 1: The binding energy per nucleon of Fe-56 is higher than that of U-238.
 Statement 2: Fe-56 is more stable than U-238.
- 1) Statement 1 is true, Statement 2 is true; Statement 2 is the correct explanation of Statement 1.
 - 2) Statement 1 is true, Statement 2 is true; Statement 2 is not the correct explanation of Statement 1.
 - 3) Statement 1 is true, Statement 2 is false.
 - 4) Statement 1 is false, Statement 2 is true.
37. Statement 1: The mass of a nucleus is always less than the sum of masses of its constituent nucleons.
 Statement 2: This mass difference is converted into binding energy of the nucleus.
- 1) Statement 1 is true, Statement 2 is true; Statement 2 is the correct explanation of Statement 1.
 - 2) Statement 1 is true, Statement 2 is true; Statement 2 is not the correct explanation of Statement 1.
 - 3) Statement 1 is true, Statement 2 is false.
 - 4) Statement 1 is false, Statement 2 is true.
38. Match the following
- | | Column-I | | Column-II |
|----|---|----|-----------|
| A) | ${}_1^1 H$ and ${}_1^2 H$ | P) | Isotopes |
| B) | ${}_6^{14} C$ and ${}_7^{14} N$ | Q) | Isobars |
| C) | ${}_{20}^{40} Ca$ and ${}_{18}^{38} Ar$ | R) | Isotones |
| D) | ${}_6^{12} C$ and ${}_6^{14} C$ | | |
- 1) A → P, B → Q, C → R, D → P 2) A → Q, B → P, C → R, D → Q
 3) A → P, B → Q, C → Q, D → R 4) A → R, B → R, C → P, D → Q

**THE PERFECT HAT-TRICK WITH ALL- INDIA RANK 1
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39. The binding energy per nucleon of ${}_2^4He$ is 7.0 MeV and that of ${}_1^2H$ is 1.1 MeV. What is the energy released in the fusion of two deuterium nuclei to form a helium nucleus?
- 21.6 MeV
 - 23.6 MeV
 - 25.0 MeV
 - 28.2 MeV
40. A nucleus of uranium (U-238) emits an alpha particle. What is the resulting nucleus?
- ${}_{92}^{234}U$
 - ${}_{90}^{234}Th$
 - ${}_{92}^{236}U$
 - ${}_{90}^{238}Th$
41. A radioactive nucleus n_2 three times the decay constant of another radioactive nucleus n_1 . If initially both have the same number of nuclei N_0 , what is the ratio of the number of nuclei of n_2 to those of n_1 after one half-life of n_1 ?
- $\frac{1}{4}$
 - $\frac{1}{8}$
 - 4
 - 8
42. A radioactive sample contains two isotopes A and B that decay simultaneously. Their half-lives are: $t_{1/2,A}=2$ hours, $t_{1/2,B}=4$ hours. Initially, the number of nuclei of A and B are equal. What will be the ratio $\frac{N_A}{N_B}$ after 4 hours?
- 1:1
 - 1:2
 - 1:4
 - 1:8
43. Two radioactive substances X and Y decay simultaneously. Their decay constants are : $\lambda_X = 0.1 \text{ min}^{-1}$, $\lambda_Y = 0.2 \text{ min}^{-1}$ initially, $N_X(0) = N_Y(0)$. after how much time will $N_Y = \frac{1}{2} N_X$?
- 6.93 min
 - 13.86 min
 - 10.00 min
 - 3.47 min
44. The mass of a Uranium-235 nucleus is 235.0439 u. After absorbing a neutron (1.0087 u), it splits into two fragments: Barium-141 (140.9144 u) and Krypton-92 (91.9262 u), along with 3 neutrons (1.0087 u each). What is the energy released in the reaction?
- $${}^{235}U + {}^1n \rightarrow {}^{141}Ba + {}^{92}Kr + 3{}^1n \quad (\text{Take } 1u = 931, \text{ MeV}/c^2)$$
- 205.5 MeV
 - 178.2 MeV
 - 173.1 MeV
 - 142.8 MeV

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

JEE MAIN 2023 SINGARAJU VERKAT KOUNDINYA APPL. NO. 2022000000000000 CUT-OFF: 100% 6th-12th Class 300 300 MARKS	RANK 1	JEE Advanced 2023 VAVILALA CHIVILAS REDDY APPL. NO. 2022000000000000 CUT-OFF: 100% 6th-12th Class 341 360 MARKS	RANK 1	NEET 2023 BORA VARUN CHAKRAVARTHI APPL. NO. 2022000000000000 CUT-OFF: 100% 6th-12th Class 720 720 MARKS	RANK 1
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45. A sample of an ancient wooden artifact shows a carbon-14 activity of 2.5 disintegrations per minute per gram of carbon, while a living sample shows an activity of 10 disintegrations per minute per gram. If the half-life of carbon-14 is 5730 years, estimate the age of the artifact.
- 1) 22920 years 2) 17190 years 3) 11460 years 4) 8600 years

SECTION-II (NUMERICAL VALUE TYPE)

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

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

46. A radioactive sample of ^{66}Cu decays such that only $\frac{1}{8}$ of the sample remains after 15 minutes. What is its half-life? (in min)
47. The mass of a helium nucleus (He-4) is 4.0026 u. The mass of a proton is 1.0080 u and that of a neutron is 1.0087 u. Calculate the binding energy per nucleon (in MeV) of He-4 (Give: 1 u=931 MeV)
48. A sample has an activity of 8000 decays/s. If the number of undecayed nuclei is 2×10^{20} , find the decay constant λ in units of $10^{-17}, s^{-1}$.(Give the nearest integer.)
49. One fission of a U-235 nucleus releases 200 MeV energy. If 1 g of U-235 is fissioned completely, find the total energy released in units of $10^{10}, J$. (Given: Avogadro's number= 6×10^{23} , $1 MeV = 1.6 \times 10^{-13} J$)
50. If the half-life of a radioactive substance is 10 minutes, find its mean life in minutes. (Use $\ln 2 \approx 0.693$)

**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 APPL. NO. 202301004329 CUT-OFF RANK 2022 6 th -12 th Class 300 300 MARKS	RANK 1	JEE Advanced 2023 VAVILALA CHIVILAS REDDY APPL. NO. 202301004329 CUT-OFF RANK 2022 6 th -12 th Class 341 360 MARKS	RANK 1	NEET 2023 BORA VARUN CHAKRAVARTHI APPL. NO. 202301004329 CUT-OFF RANK 2022 6 th -12 th Class 720 720 MARKS	RANK 1
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**CHEMISTRY****Max Marks: 100****SECTION-I (SINGLE CORRECT ANSWER TYPE)**

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

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

51. Which of the following are not essential amino acids

- | | | | |
|--------------|-----------|--------------|-------------|
| A) Histidine | B) Serine | C) Threonine | D) Cysteine |
| 1) A&B | 2) B&C | 3) B&D | 4) C&D |

52. Match the reactions given in column I with the statements given in column II

Column I		Column II	
i	Ammonolysis	A	Amines with lesser number of carbon atoms
ii	Gabriel phthalimide synthesis	B	Detection test for primary amines
iii	Hoffmann Bromamide reaction	C	Reaction of Phthalimide with KOH and R-X
iv	Carbylamine Reaction	D	Reaction of alkylhalides with NH ₃

1) i → b ii → a iii → d iv → c 2) i → c ii → a iii → d iv → b

3) i → a ii → b iii → d iv → c 4) i → d ii → c iii → a iv → b

53. Assertion : All naturally occurring alpha amino acids except glycine are optically active.

Reason : Most naturally occurring amino acids have L-configuration

- 1) Assertion and reason both are correct statements and reason explains the assertion
- 2) Assertion and reason both are correct statements but reason does not explain assertion
- 3) Assertion is correct statement and reason is wrong statement
- 4) Assertion is wrong statement and Reason is correct statement

54. Assertion :- α -halo carboxylic Acid on reaction with dil. NH₃ gives good yield of

amines is very low when prepared from alkyl halides

Reason:- Amino acids do not exist in zwitter ion form in aqueous medium

Choose the correct answer form the options given below

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

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

**JEE MAIN
2023**

SINGARAJU
VENKAT KOUNDRINA
APPL. NO. 202201045309
CUT-OFF RANK 1
6th-12th Class
300
300
MARKS



RANK

**JEE Advanced
2023**

VARILALA
CHIVILAS REDDY
APPL. NO. 202201045309
CUT-OFF RANK 1
6th-12th Class
341
360
MARKS



RANK

**NEET
2023**

BORA VARUN
CHAKRAVARTHI
APPL. NO. 202201045309
CUT-OFF RANK 1
6th-12th Class
720
720
MARKS



RANK



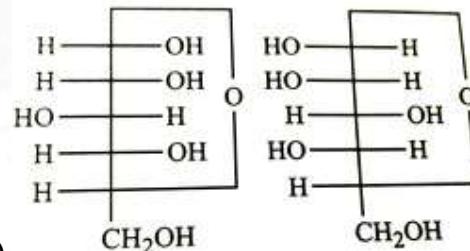
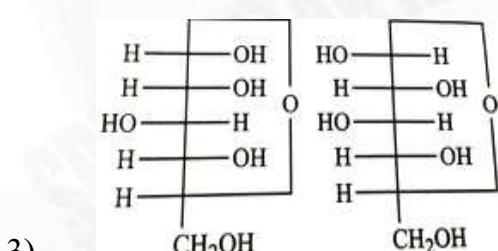
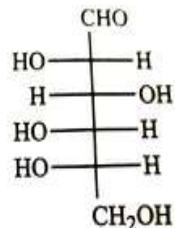
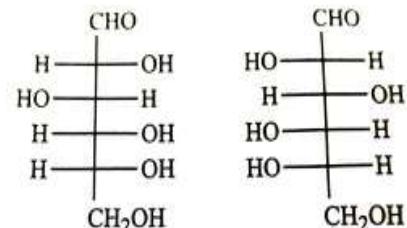
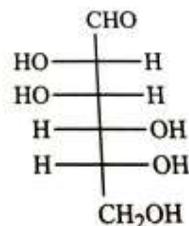
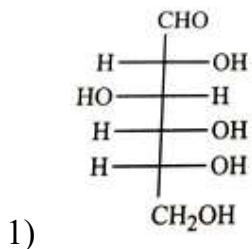
55. Statement I: Cellulose is a polymer of glucose.
 Statement II: Carbohydrates which show mutarotation can reduce Fehling's solution
 1) Statement I is true, Statement II is true , Statement II is a correct explanation of Statement I
 2) Statement I is true, Statement II is true , Statement II is not a correct explanation of Statement I
 3) Statement I is true, Statement II is false
 4) Statement I is false, Statement II is true
56. Statement I: Primary structure of protein is the amino acid sequence.
- I
— N — H
- Statement II: Intramolecular hydrogen bonding between carbonyl group and group is responsible for the folding of polypeptide chain.
- 1) Statement I is true, Statement II is true , Statement II is a correct explanation of Statement I
 2) Statement I is true, Statement II is true , Statement II is not a correct explanation of Statement I
 3) Statement I is true, Statement II is false
 4) Statement I is false, Statement II is true
57. The term Anomers of glucose refers to
- 1) Enantiomers of glucose
 2) Isomers of glucose that differ in configuration at carbon one [C_1]
 3) Isomers of glucose that differ in configuration at carbon one and carbon four [C_1 and C_4]
 4) A mixture of (D) glucose and (L) glucose
58. A tetra peptide 'X' on complete hydrolysis produced Glycine (Gly), Alanine(Ala), Valine(Val),Leucine(Leu) in equimolar proportion each. The number of tetra peptides (sequences) possible involving each of these Amino acids is
- 1) $48/2$ 2) $24/2$ 3) $8/2$ 4) $16/2$
59. Type of Amino acids which are not obtained by hydrolysis of proteins is
- A) γ B) β C) α D) δ
- 1) A,B and D 2) B,C and D 3) A,C, and D 4) only C

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

JEE MAIN 2023 SINGARAJU VERKAT KOUNDINYA APPL. NO. 2022014539 CUT-OFF 12 th Class 300 300 MARKS	RANK 1	JEE Advanced 2023 VAVILALA CHIVILAS REDDY APPL. NO. 2022014529 CUT-OFF 12 th Class 341 360 MARKS	RANK 1	NEET 2023 BORA VARUN CHAKRAVARTHI APPL. NO. 2022014527 CUT-OFF 12 th Class 720 720 MARKS	RANK 1
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60. Which of the following statement is Incorrect about Amylose
- 1) Amylose is insoluble in H_2O
 - 2) Amylose is soluble in H_2O
 - 3) Amylose is a long linear molecule > 200 glucose units
 - 4) Amylose is a polysaccharide made of glucose units
61. Glycogen is the other name of
- 1) Animal starch
 - 2) plant starch
 - 3) Both Animal and plant starch
 - 4) Maltose
62. Which of the following disaccharides is formed with two identical monosaccharide units?
- 1) Maltose
 - 2) Lactose
 - 3) Sucrose
 - 4) Fructose
63. Which of the following pairs represents Anomers?



64. Glucose on treatment with excess of phenyl hydrazine forms which of the following compounds?
- 1) Oxime
 - 2) Osazone
 - 3) Gluconic acid
 - 4) Saccharic acid
65. In fibrous proteins both polypeptide chains are held together by _____
- A) Vander Waals forces
 - B) Disulphide linkage
 - C) Electrostatic forces of attraction
 - D) Hydrogen bonds
- 1) A and C
 - 2) A and B
 - 3) C and D
 - 4) B and D

**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
APPL. NO. 20230000000000000000
CUT-OFF: 1200
6th-12th Class
**300
300
MARKS**



**RANK
1**

**JEE Advanced
2023**
VAVILALA
CHIVILAS REDDY
APPL. NO. 20230000000000000000
CUT-OFF: 1200
6th-12th Class
**341
360
MARKS**



**RANK
1**

**NEET
2023**
BORA VARUN
CHAKRAVARTHI
APPL. NO. 20230000000000000000
CUT-OFF: 1200
6th-12th Class
**720
720
MARKS**



**RANK
1**



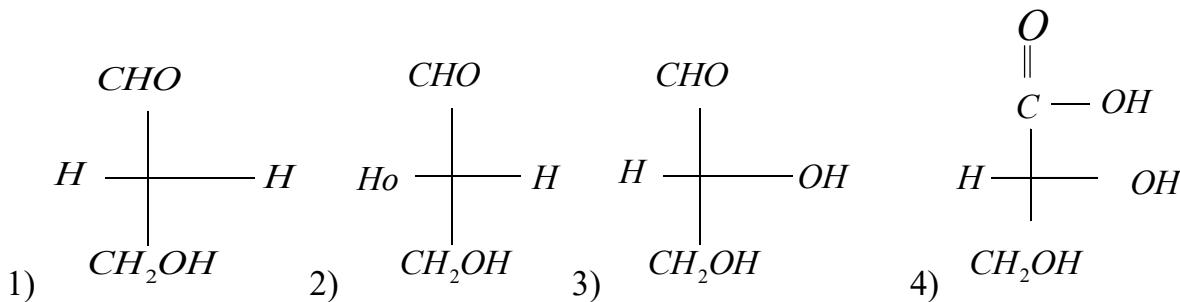
66. Which of the following statements is not true about glucose?

- 1) It is an Aldohexose
- 2) On heating with HI it forms n-hexane
- 3) It is present mainly in Furanose form
- 4) It does not give 2, 4-DNP test.

67. Which of the following is -SH group containing amino acid

- 1) Cysteine
- 2) Methionine
- 3) Histidine
- 4) Proline

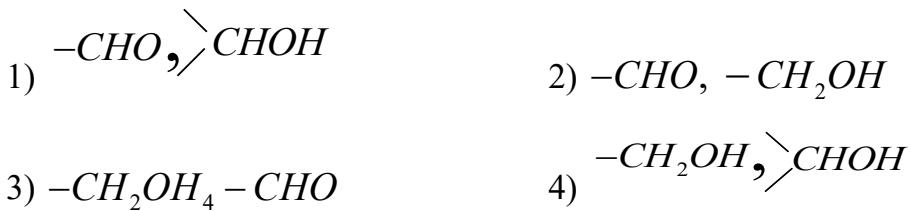
68. The correct structure of D (+)-Glyceraldehyde among the following is



69. Which of the following gives positive Liebermann nitroso test?

- 1) 2-butanamine
- 2) N-ethyl-2-pentanamine
- 3) N-methylpiperidine
- 3) N,N-dimethyl cyclohexylamine

70. The functional groups involved in the conversion of glucose to Gluconic acid and Gluconic acid to saccharic acid respectively are



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

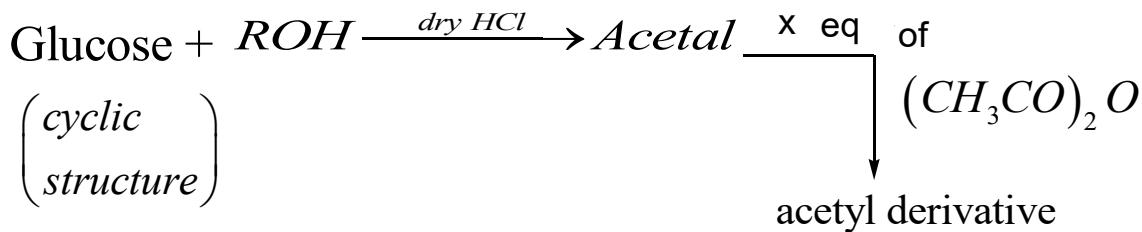
**THE PERFECT HAT-TRICK WITH ALL- INDIA RANK 1
IN JEE MAIN 2023 JEE ADVANCED 2023 AND NEET 2023**





71. How many chiral centers are present in the structure of D-Glucose (Open-chain form)?

72.



Find the maximum value of X ?

73. Maltose is composed of two $\alpha - D - Glucose$ units in which Cx of one glucose is linked to Cy of another glucose unit. Find the value of x + y (carbon atoms of glucose units has IUPAC representation)
74. Out of the following how many compounds give a positive Benedict's test?
Glucose, Fructose, Sucrose, Maltose, Lactose
75. What is the PI (isoelectric point) of glycine? If the structure has Pka_1 and Pka_2 as 2.3 and 9.6 respectively.

**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 APPL. NO. 202301045309 CUT-OFF RANK 1 6 th -12 th Class 300 300 MARKS	RANK 1	JEE Advanced 2023 VAVILALA CHIVILAS REDDY APPL. NO. 202301045309 CUT-OFF RANK 1 6 th -12 th Class 341 360 MARKS	RANK 1	NEET 2023 BORA VARUN CHAKRAVARTHI APPL. NO. 202301045309 CUT-OFF RANK 1 6 th -12 th Class 720 720 MARKS	RANK 1
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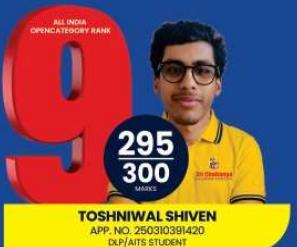


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JEE MAIN 2025

31 STUDENTS BELOW 100 AIR



BELOW
100
ALL INDIA OPEN
CATEGORY RANKS

31

BELOW
500
ALL INDIA OPEN
CATEGORY RANKS

95

BELOW
10
ALL INDIA CATEGORY
RANKS COUNT

10

BELOW
100
ALL INDIA CATEGORY
RANKS COUNT

98

BELOW
1000
ALL INDIA CATEGORY
RANKS COUNT

579

TOTAL QUALIFIED RANKS
FOR JEE ADVANCED-2025

22,094

*DLP/AITS

JEE 2025 STARS SHINE BRIGHT

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ALL INDIA OPEN CATEGORY RANKS



AIR
1

AIR
3

AIR
5

AIR
6

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H.T.No. 251134112*

UJJWAL KESARI
H.T.No. 252016104*

AKSHAT KUMAR CHAURASIA
H.T.No. 254065055*

BELOW
100
ALL INDIA OPEN
CATEGORY RANKS

29

BELOW
500
ALL INDIA OPEN
CATEGORY RANKS

113

BELOW
1000
ALL INDIA OPEN
CATEGORY RANKS

205

BELOW
1000
ALL INDIA CATEGORY
RANKS COUNT

745

NUMBER OF
QUALIFIED RANKS

4,212

*DLP/AITS



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