







Sri Chaitanya IIT Academy.,India.

A right Choice for the Real Aspirant

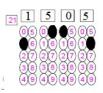
ICON Central Office - Madhapur - Hyderabad

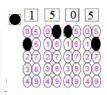
SEC: Sr.S60\_Elite, Target & LIIT-BTs JEE-MAIN Date: 03-01-2025 Time: **09.00Am to 12.00Pm** GTM-13/08 Max. Marks: 300

#### IMPORTANT INSTRUCTION:

- 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 Capit	):					
Admission Number:						
Candidate's Signature:	Invigilator's Signature:					
02.01.2025 Sr S60 Elita Target & LHT PTs Joa Main CTM 12/09 Test Syllabus						

03-01-2025\_Sr.S60\_Elite, Target & LIIT-BTs\_Jee-Main-GTM-13/08\_Test Syllabus

MATHEMATICS: TOTAL SYLLABUS
PHYSICS: TOTAL SYLLABUS
CHEMISTRY: TOTAL SYLLABUS

Sec: Sr.S60\_Elite, Target & LIIT-BTs



Page 2



















#### **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.

- $\frac{\tan x \sqrt{\tan x} \sin x \sqrt{\sin x}}{x^3 \cdot \sqrt{x}}$  Equals 1.
  - 1) 0.75
- 2) 0.85
- 3) 0.95
- **4)** 1
- 2. The mean and standard deviation of 20 observations are found to be 10 and 2 respectively. On rechecking it was found that an observation by mistake was taken 8 instead of 12. The correct standard deviation is
  - 1)  $\sqrt{3.86}$
- 2) 1.8
- 3)  $\sqrt{3.96}$
- 4) 1.94
- Let the solution curve y = f(x) of the differential equation 3.

$$\frac{dy}{dx} + \frac{xy}{x^2 - 1} = \frac{15x^4 + 4x^3 + 4x + 1}{\sqrt{1 - x^2}}, x \in (-1, 1) \text{ passes through the origin. Then } \int_{-1/2}^{1/2} \frac{f(x)dx}{\left(x^2 + 2\right)} \text{ is equal}$$

to.

- 1)  $\frac{\pi}{6}$  2)  $\frac{\pi}{6} \frac{\sqrt{3}}{4}$  3)  $\frac{\pi}{3} \frac{\sqrt{3}}{4}$  4)  $\frac{\pi}{3} \frac{1}{4}$
- Let  $S_k = \sum_{r=1}^k \tan^{-1} \left( \frac{6^r}{2^{2r+1} + 3^{2r+1}} \right)$ . Then  $\lim_{k \to \infty} S_k$  is equal to
- 1)  $\tan^{-1}\left(\frac{3}{2}\right)$  2)  $\frac{\pi}{2}$  3)  $\cot^{-1}\left(\frac{3}{2}\right)$  4)  $\tan^{-1}(3)$
- The value of the definite integral  $\int_{-\infty}^{3\pi/8} \frac{11 + 4\cos 2x + \cos 4x}{1 \cos 4x} dx$  equals: 5.

  - 1)  $-6 \frac{\pi}{4}$  2)  $6\sqrt{2} \frac{\pi}{4}$  3)  $12 \frac{\pi}{2}$  4)  $6 \frac{\pi}{4}$

Sec: Sr.S60\_Elite, Target & LIIT-BTs



















- 6. If p, q, r are prime numbers and  $\alpha, \beta, \gamma$  are positive integers such that L. C. M. of  $\alpha, \beta, \gamma$  is  $p^3q^2r$  and greatest common divisor of  $\alpha, \beta, \gamma$  is pqr, then the number of possible triplets  $(\alpha, \beta, \gamma)$  will be:
  - 1) 36
- **2)** 72
- **3)** 144
- **4)** 60
- 7. Let  $f(x) = \text{Max} \left\{ x^2, (1-x)^2, 2x(1-x) \right\}$  Where  $0 \le x \le 1$ , if the Area of the region bounded by the curves y=f(x), x-axis, x=0 and x=1 is  $\frac{p}{q}$ ; (where p, q are coprime numbers) then p+q=\_\_\_\_.
  - 1) 30
- **2)** 40
- 3) 44
- **4)** 72
- **8.** Match the items of Column-I with Column-II

Column-I			Column-II	
I	If the coordinates of a point are $(4\tan\theta, 3\sec\theta)$ where $\theta$ ( $\theta \neq (2n+1)\frac{\pi}{2}, n \in Z$ ) is parameter then the points lies on a conic whose eccentricity is	P	$\sqrt{3}$	
II	If an ellipse has the length of major axis 10 units and semi minor axis length 4 units, then this ellipse has eccentricity	Q	$\frac{4}{5}$	
III	If AB is double ordinate of a hyperbola $\frac{x^2}{a^2} - \frac{y^2}{9} = 1$ such that triangle OAB is an equilateral triangle of side '2' then eccentricity of hyperbola is (where O is centre of Hyperbola)	R	$\frac{\frac{4}{5}}{\frac{5}{3}}$	
IV	If the foci of ellipse $\frac{x^2}{K^2a^2} + \frac{y^2}{a^2} = 1$ and hyperbola $\frac{x^2}{a^2} - \frac{y^2}{a^2} = 1$ coincide then K can be	S	$\frac{3}{5}$	
	Fducational III	T	$\sqrt{\frac{13}{3}}$	

1) I-R; II-S; III-T; IV-P

2) I-S; II-P; III-Q; IV-T

3) I-P; II-T; III-S; IV-Q

4) I-Q; II-S; III-P; IV-T

Sec: Sr.S60\_Elite, Target & LIIT-BTs



















- An urn contains 7 white and 5 black balls. A ball is drawn at a random and is put back into 9. the urn along with 3 additional balls of the same colour as that of the ball drawn. A ball is again drawn at a random. Then the probability that the ball drawn is white is
  - 1)  $\frac{7}{32}$
- 2)  $\frac{5}{12}$
- 3)  $\frac{7}{12}$
- 4)  $\frac{10}{25}$
- Let  $a_1, a_2, a_3, \dots$  be an arithmetic progression. If  $\frac{a_1 + a_2 + \dots + a_{10}}{a_1 + a_2 + \dots + a_P} = \frac{100}{P^2} (where P \neq 0)$ **10.**

then  $\frac{a_{11}}{a_{10}} =$ \_\_\_\_\_

- 1)  $\frac{19}{21}$  2)  $\frac{100}{21}$  3)  $\frac{21}{19}$

- A straight line L intersects perpendicularly both the lines: 11.

$$\frac{x+2}{2} = \frac{y+6}{3} = \frac{z-34}{-10}$$
 and  $\frac{x+6}{4} = \frac{y-7}{-3} = \frac{z-7}{-2}$ 

Then the square of perpendicular distance of origin from L is

1) 5

2) 6

- Let origin lies inside the circle  $x^2 + y^2 10x 4\sqrt{2}y c = 0, c > 0$ . A PQ chord through **12.** origin(where P,Q lies on circle) is such that OP = 2, OQ = 8 (where O is the origin), then the radius of the circle is
  - 1) 5

2) 6

3) 7

- 4)8
- The length of focal chord AB of ellipse  $\frac{x^2}{4} + \frac{y^2}{3} = 1$  is  $\left( \text{Given } A = \left( \frac{8}{5}, \frac{3\sqrt{3}}{5} \right) \right)$ 13.
  - 1)  $\frac{4}{5}$
- 2)  $\frac{16}{5}$
- 3)  $\frac{32}{5}$  4)  $\frac{64}{5}$
- Let  $f(x) = \int x^{\sin x} (1 + x \cdot \cos x \cdot \ln x + \sin x) dx$  and  $f(\frac{\pi}{2}) = \frac{\pi^2}{4}$ . Find the value of  $\cos(f(\pi))$ . **14.** 
  - 1)  $\frac{\pi}{2}$
- **2**)-1

3)  $\pi$ 

**4)** 1

Sec: Sr.S60\_Elite, Target & LIIT-BTs





**ADVANCED 2023** 











- 15. The value of  $\sum_{r=1}^{5} \left( x^r + \frac{1}{x^r} \right)^2$ , where x satisfies the equation  $x^2 + x + 1 = 0$ , is
  - 1) 5

**2)** 6

3) 7

- 4) 8
- **16.** Let R be a relation on real numbers given by  $R = \{(a,b): 3a-3b+\sqrt{7} \text{ is an irrational number}\}.$

Then R is

- 1) Reflexive but neither symmetric nor transitive
- 2) Reflexive and transitive but not symmetric
- 3) Reflexive and symmetric but not transitive
- 4) An equivalence relation
- 17. A function f is defined on [-3,3] as  $f(x) = \begin{cases} \min\{|x|, 2-x^2\}, -2 \le x \le 2\\ \lfloor |x| \rfloor \end{cases}$  [x] denote greatest integer

 $\leq x$ , number of points where f is not differentiable in (-3,3) is

1)3

2) 4

3)5

- **4)** 2
- 18. If m and n be the absolute maximum and minimum values of the function  $f(x) = |x^2 7x + 10| 5x + 27; x \in [-2,14]$  then m+n is
  - 1) 65
- 2) 66
- **3)** 68
- 4) 70
- 19. If the parabola  $y = ax^2 + bx + c$  has vertex at (4,2) and  $a \in [1,3]$ , then the absolute difference between the extreme values of abc is
  - 1) 3600
- **2)** 144
- 3) 3456
- 4) 169
- **20.** Let set  $A = \{x \in I^+ : f(x) = x^3 8x^2 + 20x 13 \text{ is a prime number}\}$  Consider the statements:

Statement – I: Number of elements in set A is 3

Statement – II: sum of all elements in set A is 9, then

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

Sec: Sr.S60\_Elite, Target & LIIT-BTs

Page 6



















#### **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  $\vec{a}, \vec{b}, \vec{c}$  are three vectors of which every pair is non collinear, and the vectors  $\vec{a} + 3\vec{b}$  and  $2\vec{b} + 3\vec{c}$  are collinear with  $\vec{c}$  and  $\vec{a}$  respectively. If  $\vec{b}.\vec{b} = 1$ , then find  $|2\vec{a} + 9\vec{c}|$ .
- 22. The sum of the cubes of all the roots of the equation  $x^4 3x^3 2x^2 + 3x + 1 = 0$  is \_\_\_\_\_
- **23.** Let  $f(\theta) = \frac{1}{1 + (\tan \theta)^x}$  and  $s = \sum_{\theta=1}^{89^0} f(\theta)$  then the value of  $\sqrt{2s 25} = \underline{\hspace{1cm}}$
- 24. The remainder when the number  $3^{2^{2^3}} (3^{2^2})^3$  is divide by 8, is......
- 25. let  $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$  and  $B = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$  are two matrices such that AB = BA and  $c \ne 0$ . Then the value of  $\frac{a-d}{3b-c}$  is  $\frac{-14}{K}$  then  $K = \frac{a-d}{3b-c}$

Sec: Sr.S60\_Elite, Target & LIIT-BTs



Infinity Learn

Page 7

















PHYSICS Max Marks: 100

#### **SECTION-I (SINGLE CORRECT ANSWER TYPE)**

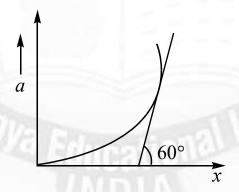
This section contains **20 Multiple Choice Questions**. Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

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

- 26. Consider  $S = x\cos\theta$  for  $x = (2.0 \pm 0.2)$ cm and  $\theta = (53 + 2)^\circ = (0.9250 \pm 0.0035)$  Radians. find absolute error in S. Given  $\cos 53^\circ = \frac{3}{5}$ ,  $\sin 53^\circ = \frac{4}{5}$ .
  - 1) 0.216 cm
- **2)** 0.126 cm
- **3)** 0.136 cm
- 4) 0.116 cm
- 27. Statement I : If the distance between plates of a charged isolated capacitor increases , then the potential energy in the electric field of capacitor increases.

Statement- II: The energy stored in a capacitor is always directly proportional to separation between the plates

- 1) Both Statement I and Statement II are true
- 2) Statement I is true and Statement II is false
- 3) Statement I is false and Statement II is true
- 4) Both Statement I and Statement II are false
- 28. A particle starts moving with initial velocity  $4 \text{ ms}^{-1}$  along the x-axis from origin. Its acceleration is varying with its position x in parabolic nature as shown in figure. At  $x = \sqrt{3}$  m, a tangent to the curve makes an angle  $60^{\circ}$  with positive x-axis as shown. Then at  $x = \sqrt{3}$  m



Sec: Sr.S60\_Elite, Target & LIIT-BTs



Infinity Learn

Page 8 39













**Statement-I**: Velocity  $(v) = \sqrt{\sqrt{3} + 16} \text{ ms}^{-1}$ 

**Statement -II**: Acceleration (a) =  $3 \text{ ms}^{-2}$ 

- 1) Both Statement I and Statement II are true
- 2) Statement I is true and Statement II is false
- 3) Statement I is false and Statement II is true
- 4) Both Statement I and Statement II are false
- A bird is flying at the height of 12 cm from the surface of a lake and a fish is swimming at a **29.** depth of 24 cm from the surface.

(Take is  $\mu = 4/3$ )

Column-A			Column-B	
(A)	Distance of fish from the surface as seen by bird	(P)	16 cm	
(B)	Distance of bird from the surface as seen by fish	(Q)	40 cm	
(C)	C) Distance between fish and bird as seen by bird		18 cm	
(D)	Distance between fish and bird as seen by fish	(S)	30 cm	

- 1)  $A \rightarrow P, B \rightarrow R, C \rightarrow S, D \rightarrow Q$  2)  $A \rightarrow R, B \rightarrow P, C \rightarrow Q, D \rightarrow S$
- 3)  $A \rightarrow R, B \rightarrow P, C \rightarrow S, D \rightarrow Q$  4)  $A \rightarrow P, B \rightarrow R, C \rightarrow Q, D \rightarrow S$
- A particle undergoes from position O(0,0,0) to A(a,2a,0) via path  $y = \frac{2x^2}{a}$  in x-y plane **30.** under the action of a force which varies with particle's (x, y, z) coordinate as

 $\vec{F} = x^2 y \hat{i} + y z^2 e^{2z} \hat{j} - \left(\frac{z}{x+2y}\right) \hat{k}$ . Work done by the force  $\vec{F}$  is: (all symbols have their

usual meaning and they are in SI unit.)

- 1)  $\frac{4a^4}{5}$

- 2)  $\frac{a^4}{5}$  3)  $\frac{a^3}{4}$  4)  $\frac{2a^4}{5}$

Sec: Sr.S60\_Elite, Target & LIIT-BTs



















Find the ratio of the extension in upper spring to lower spring. 31.



- 1)  $\frac{m_1 k_1}{m_2 k_2}$  2)  $\frac{m_2 k_1}{m_2 k_2}$
- 3)  $\frac{(m_1+m_2)k_2}{m_1k_1}$  4)  $\frac{(m_1+m_2)k_2}{m_2k_1}$
- A source of alternating emf  $E = E_0 \sin \omega t$  is connected in series with a capacitor and **32.** inductor in a circuit with negligible resistance. Natural frequency of LC oscillation is  $\omega_0 = \frac{1}{\sqrt{IC}}$ . If charge on capacitor at any moment is given by  $Q = Q_0 \sin \omega t$  then magnitude of  $Q_0$  is:
- 1)  $\frac{E_0}{|\omega^2 \omega_0^2|}$  2)  $\frac{E_0}{L\omega^2}$  3)  $\frac{E_0}{L|\omega^2 \omega_0^2|}$  4)  $\frac{E_0}{L\omega_0^2}$
- 33. Two spherical bodies of masses m and 5 m and radii R and 2R respectively, are released in free space with initial separation between their centres equal to 12R. If they attract each other due to gravitational force only, the distance covered by smaller sphere just before collision is
  - 1)  $\frac{15R}{2}$
- **2)**  $\frac{13R}{2}$
- 3) 10 R 4)  $\frac{17R}{2}$

Sec: Sr.S60\_Elite, Target & LIIT-BTs









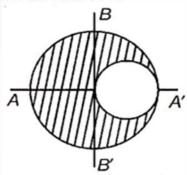




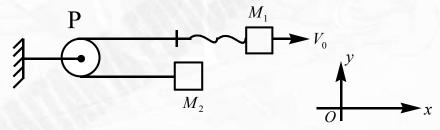




**34.** From a uniform sphere of mass M and radius R a cavity of diameter R is created as shown, Find the ratio of moment of inertia of the sphere left about AA' and BB'



- 1)  $\frac{15}{28}$
- **2)**  $\frac{28}{15}$
- 3)  $\frac{31}{30}$
- 4)  $\frac{62}{57}$
- **35.** The particles  $M_1 \& M_2$ , and the pulley P are lying on smooth horizontal surface. Initially the string is loose.



**Assertion:** The particle  $M_1$  is projected with a speed  $V_0$ . Then the particle  $M_2$  moves with a velocity  $\left(\frac{M_1V_0}{M_1+M_2}\right)$  just after the collision.

**Reason:** The momentum of system $(M_1 + M_2)$  is conserved along x – direction.

- 1) Assertion is True, Reason is True; Reason is a Correct explanation for Assertion
- 2) Assertion is True, Reason is True; Reason is NOT a Correct explanation for Assertion
- 3) Assertion is True, Reason is False
- 4) Assertion is False, Reason is True



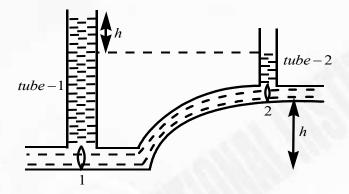




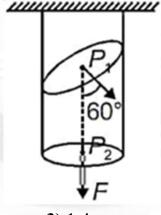




- 36. A non-viscous fluid of density  $\rho$  is flowing in a tube as shown in figure. Area of section-(1) is double that of section-(2). Centre of mass of section-(2) is h height above the Centre of mass of section-(1) and level of water in tube-1 is 'h' height above that in tube-2. Then:



- 1) Velocity of fluid of section-(1) is  $\sqrt{\frac{gh}{3}}$
- 2) Velocity of fluid at section-(1) is  $\sqrt{\frac{2gh}{3}}$
- 3) Work done by gravitational force per unit volume from section-(1) to section-(2) is  $\rho gh$
- 4) Work done by elastic forces (pressure) per unit volume from section-(1) to section-(2) is  $3\rho gh$
- 37. A massless uniform rod is subjected to force F at its free end as shown in figure. The ratio of tensile stress at plane  $P_1$  to stress at  $P_2$  is



- **1)** 1:2
- **2)**  $\sqrt{2}:1$
- 3) 1:4
- **4)** 3:2

Sec: Sr.S60\_Elite, Target & LIIT-BTs







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



JEE Advanced 2023 VAVILALA CHIDWLAS BEDDY BEST CIRCLETONYA 0°-12° Class 341 360





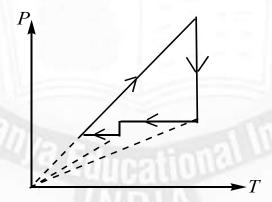


Page 12

- SRI CHAITANYA IIT ACADEMY, INDIA
- Binding Energy per nucleon of a fixed nucleus  $X^A$  is 6 MeV. It absorbs a neutron moving 38. with KE = 2MeV, and converts into Y, emitting a photon of energy 1 MeV. The Binding Energy per nucleon of Y (in MeV) is

  - 1)  $\frac{(6 \text{ A}+1)}{(\text{A}+1)}$  2)  $\frac{(6A-1)}{(A+1)}$  3) 7
- 4)  $\frac{6A+1}{4-1}$
- Electrons with de-Broglie wavelength  $\lambda$  fall on the target in an X-ray tube. The cut-off **39.** wavelength of the emitted X-rays is
- 1)  $\lambda_0 = \frac{2mc\lambda^2}{h}$  2)  $\lambda_0 = \frac{2h}{mc}$  3)  $\lambda_0 = \frac{2m^2c^2\lambda^3}{h^2}$  4)  $\lambda_0 = \lambda$
- Time period of a particle executing SHM is 16 s. At time t = 2s, it crosses the mean position **40.** its amplitude of motion is  $\frac{32\sqrt{2}}{\pi}m$ . Its velocity at t=4s is
  - 1) 1  $ms^{-1}$
- **2)**  $2 ms^{-1}$
- 3) 4  $ms^{-1}$
- 4)  $8 \, ms^{-1}$
- A thick uniform rope of Length L is hanging from a rigid support. A transverse wave of 41. wavelength  $\lambda_0$  is set up in the middle of the rope. The wavelength of the wave as it reaches the top most point is
  - 1)  $2\lambda_0$
- 2)  $\sqrt{2}\lambda_0$
- 3)  $\frac{\lambda_0}{\sqrt{2}}$
- 4)  $\lambda_0$

P-T curve for a cyclic process is as shown 42.



P-V graph for this process will be:

Sec: Sr.S60\_Elite, Target & LIIT-BTs

Page 13







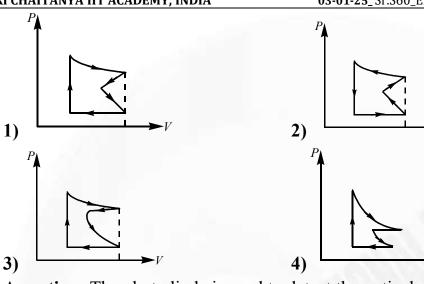










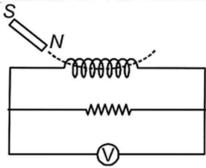


**43. Assertion:** The photodiode is used to detect the optical signals. These diodes are preferably operated in reverse biased mode

Reason: fractional change in majority carriers produce higher reverse bias current

- 1) Assertion is True, Reason is True; Reason is a Correct explanation for Assertion
- 2) Assertion is True, Reason is True; Reason is NOT a Correct explanation for Assertion
- 3) Assertion is True, Reason is False
- 4) Assertion is False, Reason is True
- 44. Energy required to place a body of mass m from an orbit of radius 2R to 3R is (Given that M=mass of earth, R=Radius of Earth)
  - $1) \frac{GMm}{3R}$
- $2) \frac{GMm}{12R}$
- 3)  $\frac{GMm}{18R}$
- 4)  $\frac{GMm}{6R}$
- **45.** A small magnet is made to oscillate with a particular frequency through a coil as shown in figure.

The time variation of magnitude of emf generated across the coil during one cycle is



Sec: Sr.S60\_Elite, Target & LIIT-BTs

Page 14









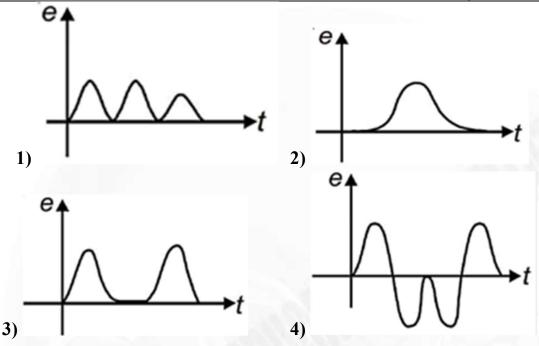










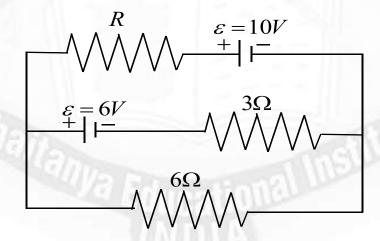


#### **SECTION-II (NUMERICAL VALUE TYPE)**

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

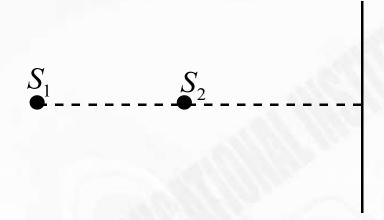
46. In the given circuit if the internal resistance of the batteries are negligible, then for what value of resistance R (in  $\Omega$ ) will the thermal power generated in it be maximum.





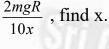


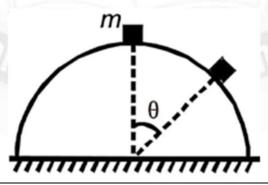
47. Two coherent monochromatic point sources  $S_1$  and  $S_2$  are placed in front of an infinite screen as shown in figure. Wavelength of the light emitted by both the sources is  $\lambda$ . Initial phase difference between the sources is zero.



Initially  $S_1S_2 = 2.5\lambda$  and the number of bright circular rings on the screen in  $n_1$ . If the distance  $S_1S_2$  is increased and made  $5.7\lambda$ , the number of bright circular rings becomes  $n_2$ . The difference  $n_2 - n_1$  is:

48. A particle mass of m is placed in equilibrium at the top of a fixed rough hemisphere of radius R. Now the particle is given a gentle push so that it starts sliding on the surface of the hemisphere. It is found that the particle leaves the contact with the surface of the hemisphere at angular position  $\theta$  with the vertical where  $\cos \theta = \frac{3}{5}$ . If the work done against friction is 2mgR





Sec: Sr.S60\_Elite, Target & LIIT-BTs





39

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



JEE Advanced 2023 VAVILALA CHIDVILAS REDBY HICKOGENERAL LIVE JEW CLERKS 341 360



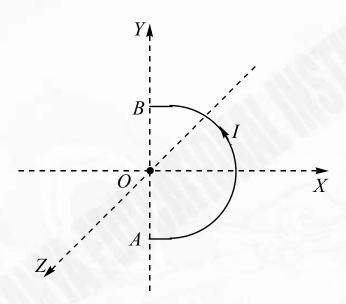




Page 16



49. A conductor carrying current 60A is in the form of a semicircle AB of radius R and lying in xy-plane with its centre ' O ' at origin as shown in the figure. The magnitude of  $\oint \vec{B} \cdot \vec{d}\ell$  for the circle  $x^2 + z^2 = 3R^2$  in xz-plane due to current in curve AB is  $10n\mu_0$ . Find the value of n ( n is an integer)



**50.** The electric resistance of medium depends upon permeability  $(\mu)$  and permittivity  $(\varepsilon)$  as given below  $R \propto (\mu)^a (\varepsilon)^b$ . If a - b = N. The value of N is ......





CHEMISTRY Max Marks: 100

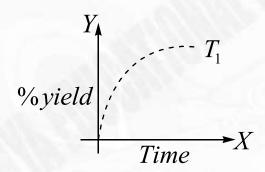
#### **SECTION-I (SINGLE CORRECT ANSWER TYPE)**

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.

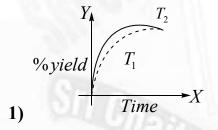
Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases.

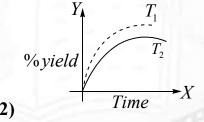
- **51.** Percentage composition of Carbon by mole in isopentane
  - 1) 29.41%
- 2) 28.41%
- 3) 50%
- 4) 60%
- 52. The percentage yield of  $SO_3(g)$  as a function of time in the reaction

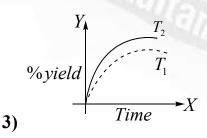
$$SO_2(g) + \frac{1}{2}O_2(g) \rightleftharpoons SO_3(g)$$
,  $\Delta H_r < 0$  at  $(P, T_1)$  is given below

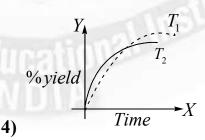


If this reaction is conducted at  $(P, T_2)$  with  $T_2 > T_1$ . The percentage yield of  $SO_3$  as a function of time is represented by









Sec: Sr.S60\_Elite, Target & LIIT-BTs









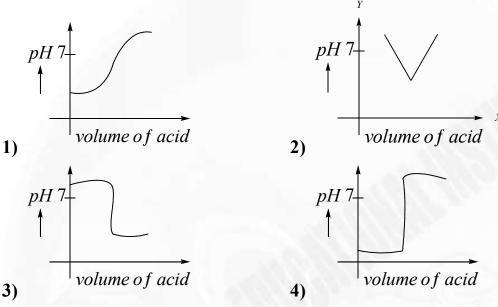












**54.** Given below are two statements: one labelled as Assertion A and other is labelled as Reason R

Assertion A: 1.24*g* of hydrated hypo dissolved in water to make 250.0*ml* solution result in 0.2M hypo solution

Reason R: Molar mass of hydrated hypo is 248gmol<sup>-1</sup>

In the light of the above statements. Choose the correct answer from the options given below

- 1) A is true but R is false
- 2) A is false but R is true
- 3) Both A and R are true but R is not the correct explanation of A
- 4) Both A and R are true and R is the correct explanation of A
- **55.** Given below are two statements

Statement-1: The limiting molar conductivities of potassium sulphate is higher compared to that of propionic acid

Statement-2: Molar conductivity decreases with decrease in concentration of electrolyte

In the light of the above statements, choose the most appropriate answer from the options



- 1) Both statement-1 and Statement-2 are false
- 2) Statement-1 is true and Statement-2 is false
- 3) Statement-1 is false but Statement-2 is true
- 4) Both Statement-1 and Statement-2 are true
- 56. Iron is extracted from its ore via the reaction

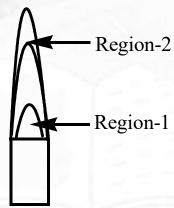
$$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$$

(Fe = 56amu)

The volume of CO (at STP) required to produce 2kg of Iron is Liters

- 1) 1200
- **2)** 1300
- **3)** 1400
- 4) 1000
- In borax bead test of Cobalt metal  $B_2O_3$  or borax  $Na_2 \lceil B_4O_5(OH)_4 \rceil .8H_2O$  is heated in a 57. Bunsen burner flame with Cobalt(II) oxide on loop of platinum wire the mixture fuses to give a glass like metaborate bead.

The colour of bead in flame region 1 and 2 respectively are



1) Blue and Green only

2) Green and Blue only

3) Blue and Blue only

- 4) Yellow and Blue only
- $PbCrO_4(s) + (excess)NaOH(aq) \rightarrow A(So lub le complex) + Na_2CrO_4(aq)$ **58.** (vellow colour) [yellowcolour]

Correct formula of complex 'A' is

- 1)  $Pb(OH)_{3}$
- **2)**  $Na_2[Pb(OH)_4]$  **3)**  $Na_3[Pb(OH)_6]$  **4)**  $Na_4[Pb(OH)_5]$

Sec: Sr.S60\_Elite, Target & LIIT-BTs























Match List-I with List-II **59.** 

	List-I Molecular Ions		List-II Number of lone pair of
			electrons on central atom
A	IF <sub>7</sub>	I	Three
В	$ICl_4^-$	II	One
С	$SO_2$	III	Two
D	$I_3^-$	IV	Zero

Choose the correct answer from the options given below

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

**3)** A - II; B - III; C - IV, D - I **4)** A - IV; B - III; C - II, D - I

Given below are two statements one is labelled as Assertion A and other is labelled as **60.** Reason R

Assertion A: Fluorine forms only one oxoacid HOF. Where as other halogens forms more Reason R: Fluorine has smallest size among all halogen and is highly electronegative In the light of above statements choose, The most appropriate answer from the options given below

- 1) A is correct but R is not correct
- 2) A is not correct but R is correct
- 3) Both A and R are correct and R is the correct explanation of A
- 4) Both A and R are correct and R is not the correct explanation of A
- Outer most electronic configuration of Th<sup>+3</sup> ion is 61.
  - 1)  $5f^1$
- **2)**  $5f^0$
- 3)  $6d^{1}$
- **4)**  $6d^27s^2$

Sec: Sr.S60\_Elite, Target & LIIT-BTs











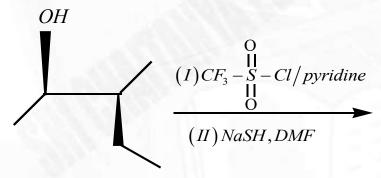




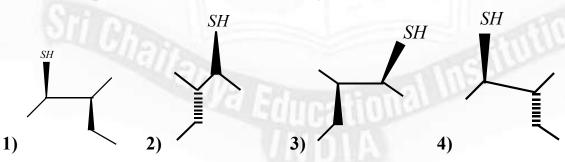


- 62. The crystal field stabilization energy (*CFSE*) and magnetic moment (spin-only) of an octahedral aqua complex of metal ion  $(M^{Z+})$  are  $-0.8\Delta_0$  and 3.87BM respectively identify  $(M^{Z+})$ 
  - **1)**  $Ti^{+2}$
- **2)**  $Co^{2+}$
- 3)  $Cr^{+3}$
- 4)  $Mn^{+2}$
- 63. An organic compound "A" with molecular formula  $C_8H_8O$  forms an orange red precipitate with 2,4-DNP reagent and gives yellow precipitate on heating with iodine in the presence of sodium hydroxide. It neither reduces Tollens or Fehlings reagent, nor does it decolourises bromine water or Baeyer's reagent. On drastic oxidation with chromic acid, It gives a carboxylic acid (B) having molecular formula  $C_7H_6O_2$ . Degree of unsaturation of compound (A) and (B) respectively are
  - 1) 5, 5
- 2) 4, 4
- 3) 3, 5
- 4) 3, 3

64.



Most stable product of the above following reaction is



Sec: Sr.S60\_Elite, Target & LIIT-BTs



Infinity Legrn

Page 22







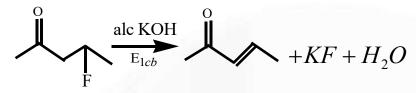






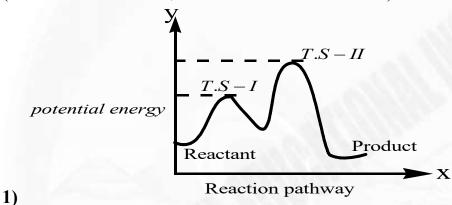


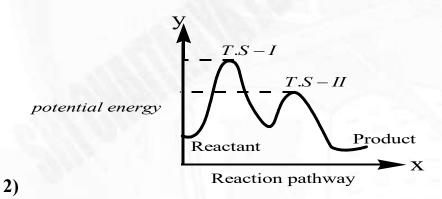
**65.** 

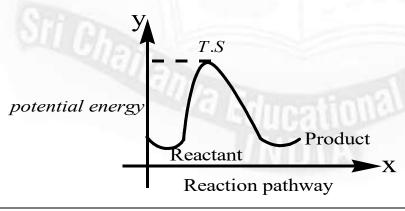


Correct energy profile diagram of the above reaction is

(T.S = Transition state; R.I = Reaction intermediate)







Sec: Sr.S60\_Elite, Target & LIIT-BTs







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



3)



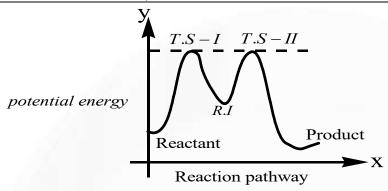








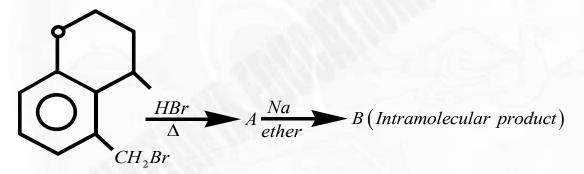




4)

- 66. Vitamin-C— $\xrightarrow{10\% \ aqueous \ NaH \ CO_3}$   $gas \uparrow$ . Evolved gas in the product is
  - 1)  $^{14}CO_2$
- **2)**  $^{12}CO_2$
- **3)** SO<sub>2</sub>
- 4) can not liberate any gas

**67.** 



Structure of A and B will be

Sec: Sr.S60\_Elite, Target & LIIT-BTs



Infinity Learn

Page 24











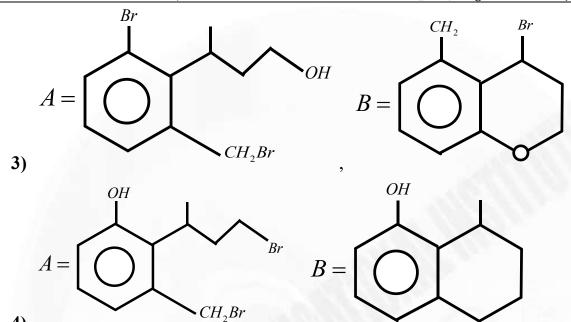


Page 25

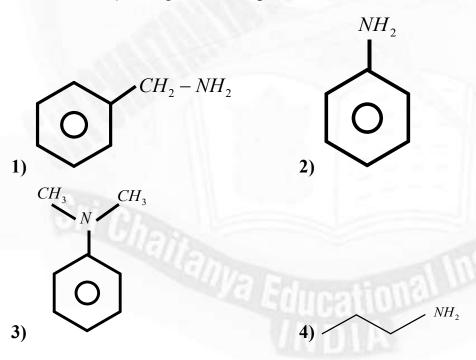


Sec: Sr.S60\_Elite, Target & LIIT-BTs

4)

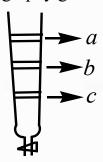


**68.** Which of the following compound in  $HCl + NaNO_2 / 0 - 5^0 C$  will form a coloured dye on reaction with  $\beta - Naphthol$  in aq NaOH





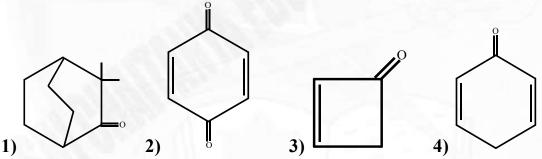
From the figure of column chromatography given below identify the correct statement 69.



- A) compound "c" is more polar than "a" and "b"
- B) compound "a" is least polar
- C) compound "b" comes out of the column before "c" and after "a"
- D) compound "a" spend more time in the column

Choose the correct answer from the options given below

- 1) A, B, D only
- 2) B and D only
- 3) only D
- **4)** A, B, C only
- Compound which can exhibit stable keto enol tautomerism **70.**



### **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

A soft drink was bottled with partial pressure of CO<sub>2</sub> of 6 bar over the liquid at room 71. temperature. The partial pressure of  $CO_2$  over the solution approaches a value of 60 bar when 88g of CO<sub>2</sub> is dissolved in 1kg of water at room temperature. The approximate pH of the soft drink is (first dissociation constant of  $H_2CO_3 = 4.0 \times 10^{-7}$ ,  $\log 2 = 0.3$ density of the soft drink =  $1gml^{-1}$ )

Sec: Sr.S60\_Elite, Target & LIIT-BTs



Page 26





#### IE PERFECT HAT-**JEE MAIN 2023 JEE ADVANCED**



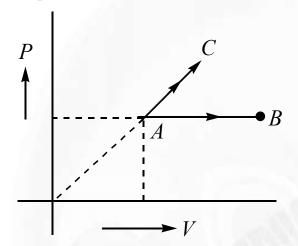




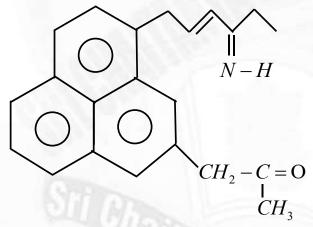




72. Two mole ideal diatomic gas is heated according to path AB and AC. If the temperature of state B and state C are equal. Calculate  $\frac{q_{AC}}{q_{AB}} \times \frac{7}{6}$  (Assume ideal diatomic gas at low temperature)



- 73. Radius ratio of second orbit of  $He^+$  and fourth orbit of  $Be^{+3}$  is  $x \times 10^{-1}$ . Value of 'x' is
- 74. Number of electrophilic centre in the given compound is \_\_\_\_\_



75. oxidation number of Mn in potassium manganate is \_\_\_\_\_

Sec: Sr.S60\_Elite, Target & LIIT-BTs



Infinity Learn Page 27















## Sri Chaitanya **Educational Institutions & Techno Schools**







# DOW

PROUDLY ACHIEVED **222 RANKS IN TOP 1000** 

SEIZES 4 RANKS IN TOP 10 IN ALL-INDIA RANKS









#### SECURED 25 RANKS IN TOP 100 **ALL INDIA OPEN CATEGORY**





































































Below 100

Below 500

Below 1000

Below 100

1000

**TOTAL QUALIFIED RANKS FOR JEE ADVANCED-2024** 





SCAN THE QR CODE