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.S60_Elite, Target & LIIT-BTs	**JEE-MAIN**	**Date: 08-01-2025**
Time: 09.00Am to 12.00Pm	**GTM-15/10**	**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

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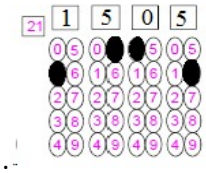

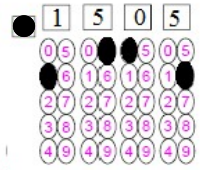

Question Answered for Marking **Question Cancelled for Marking**

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: _____**

08-01-2025_Sr.S60_Elite, Target & LIIT-BTs_Jee-Main-GTM-15/10_Test Syllabus

MATHEMATICS : TOTAL SYLLABUS

PHYSICS : TOTAL SYLLABUS

CHEMISTRY : TOTAL SYLLABUS

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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. Each student in a class of 40, studies at least one of the subjects English, Mathematics and Economics. 16 study English, 22 Economics and 26 Mathematics, 5 study English and Economic, 14 Mathematics and Economics and 2 study all the three subjects. Then the number of students who study English and Mathematics but not Economics is

1) 7 **2)** 5 **3)** 10 **4)** 4

2. The maximum value of the function

$f(x)=\frac{\sin x}{\sqrt{1-\cos^2 x}}+\frac{\cos x}{\sqrt{1-\sin^2 x}}+\frac{\tan x}{\sqrt{\sec^2 x-1}}+\frac{\cot x}{\sqrt{\operatorname{cosec}^2 x-1}}$ wherever it is defined is k.

Then $|k|$ is

1) 4 **2)** -2 **3)** 0 **4)** 2

3. Let a complex number $z, |z|\neq 1$, satisfy $\log_{\sqrt{2}}\left(\frac{|z|+11}{(|z|-1)^2}\right)\geq 0$. Then, the largest value of $|z|$ is equal to

1) 5 **2)** 2 **3)** 0 **4)** 1

4. **Statement I**: If $a_1x^2+b_1x+c_1=0$ and $a_2x^2+b_2x+c_2=0$ $(a_1\neq 0, a_2\neq 0)$ have a common root. Then $(c_1a_2-c_2a_1)^2=(b_1c_2-b_2c_1)(a_1b_2-a_2b_1)$

Statement II: The quadratic equations $x^2-6x+a=0$ and $x^2-cx+6=0$ have one root in common. The other roots of the first and second equations are integers in the ratio 4:3, if the common root is α then α^3 is 8

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1) Statement I is true and Statement II is true

2) Statement I is false and Statement II is true

3) Statement I is true and Statement II is false

4) Statement I is false and Statement II is false

5. If $A(-2,-1), B(-2,1), C(2,1)$ are the vertices of a triangle ABC, then the perpendicular distance from its circumcenter to the side BC is

1) 1 **2)** 2 **3)** 3 **4)** 4

6. If R is a relation defined by aRb *iff* $a \le b$ on $N \times N$, then which of the following is correct?

1) R is not a symmetric relation **2)** R is a symmetric relation

3) R is not a reflexive relation **4)** R is a equivalence relation

7. The letters of the word OUGHT are written in all possible ways and these words are arranged as in a dictionary, in a series. Then, the serial number of the word TOUGH is

1) 89 **2)** 100 **3)** 258 **4)** 237

8. If $\frac{dy}{dx} = \frac{2^{x+y} - 2^x}{2^y}, y(0) = 1$, then $y(1) =$

1) $\log_2(2+e)$ **2)** $\log_2(1+e)$ **3)** $\log_2(2e^3)$ **4)** $\log_2(1+e^2)$

9. If one of the diameters of the circle $x^2 + y^2 - 10x + 4y + 13 = 0$ is a chord of another circle C, whose center is (3,2), then the diameter of the circle C is:

1) $\sqrt{20}$ **2)** 4 **3)** 12 **4)** $6\sqrt{2}$

10. If the standard deviation of $a_1, a_2, a_3, \ldots a_{2025}$ is λ, then the value of standard deviation of $2a_1 - 1, 2a_2 - 1, 2a_3 - 1, \ldots 2a_{2025} - 1$ is

1) 3λ **2)** 2λ **3)** $\lambda - 1$ **4)** $2\lambda + 1$

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11. If the lines $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{\alpha}$ and $\frac{x-4}{5}=\frac{y-1}{2}=\frac{z}{\beta}$ intersect, then the absolute value of $(\beta-\alpha)$ is _____

1) 3 **2)** -3 **3)** 13 **4)** -13

12. If the ratio of the sum to n terms of two A.P.'s is $(5n+3):(3n+4)$ then the ratio of their 4^{th} terms is

1) $\frac{16}{23}$ **2)** $\frac{23}{16}$ **3)** $\frac{38}{25}$ **4)** $\frac{25}{38}$

13. If the vertex of a parabola is $(4,3)$ and its directrix is Y-axis, then the equation of latus rectum of the parabola is

1) $x=3$ **2)** $y=8$ **3)** $y=3$ **4)** $x=8$

14. Let $a_1=1,a_2,a_3,a_4.....$ be consecutive natural numbers. Then

$\tan^{-1}\left(\frac{1}{1+a_1a_2}\right)+\tan^{-1}\left(\frac{1}{1+a_2a_3}\right)+.....+\tan^{-1}\left(\frac{1}{1+a_{2024}a_{2025}}\right)$ is equal to

1) $\frac{\pi}{4}+\cot^{-1}(2025)$ **2)** $\tan^{-1}(2025)-\frac{\pi}{4}$

3) $\tan^{-1}(2024)-\frac{\pi}{4}$ **4)** $\frac{\pi}{4}-\tan^{-1}(2024)$

15. If $y=\frac{2}{\sqrt{a^2-b^2}}Tan^{-1}\left[\sqrt{\frac{a-b}{a+b}}\tan\frac{x}{2}\right],a,b>0,\ \left.\frac{dy}{dx}\right|_{x=\frac{\pi}{2}}=$

1) $\frac{1}{b}$ **2)** $\frac{1}{a}$ **3)** $\frac{2}{a}$ **4)** $\frac{2}{b}$

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16. For $\lambda > 0$, let θ be the angle between the vectors $\mathbf{a} = \hat{i} + \lambda\hat{j} - 3\hat{k}$ and $\mathbf{b} = 3\hat{i} - \hat{j} + 2\hat{k}$. If the vectors $\mathbf{a}+\mathbf{b}$ and $\mathbf{a}-\mathbf{b}$ are mutually perpendicular, then the value of $(14\cos\theta)^2$ is equal to

1) 40 **2)** 100 **3)** 25 **4)** 20

17. Let two fair six-faced dice A and B be thrown simultaneously. If E_1 is the event that die A shows up four, E_2 is the event that die B shows up two, then which of the following statements is true?

1) E_1 and E_2 are exclusive **2)** E_2 and E_1 are exhaustive

3) E_1 and E_2 are dependent **4)** E_1, E_2 are independent

18. If $\int \frac{2x^{12}+5x^9}{\left(1+x^3+x^5\right)^3}dx = \frac{x^m}{\ell\left(1+x^3+x^5\right)^r} + C$ then $\frac{m+\ell}{r} =$

1) 3 **2)** 4 **3)** 5 **4)** 6

19. Let $f(x) = x^2+9, g(x) = \frac{x}{x-9}$ and $a^2 = fog(10), b^2 = gof(3)$. If e and l denote the eccentricity and the length of the latus rectum of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, then $8e^2+l^2$ is equal to

1) 16 **2)** 12 **3)** 6 **4)** 8

20. Match the following columns:

Column I (A, B, C are matrices)		**Column - II**	
a.	If $\lvert A_{3\times3}\rvert = 2$, then $\lvert 2A^{-1}\rvert =$	p.	1
b.	If $\lvert A_{3\times3}\rvert = 1/8$, then $\lvert adj(adj(2A))\rvert =$	q.	4
c.	If $(A+B)^2 = A^2+B^2$, and $\lvert A_{2\times2}\rvert = 2$, then $\lvert B_{2\times2}\rvert =$	r.	8
d.	$\lvert A_{2\times2}\rvert = 2, \lvert B_{3\times3}\rvert = 3$ and $\lvert C_{4\times4}\rvert = 4$, then $\lvert ABC\rvert$ is equal to	s.	0
		t.	Does not exist

1) a-q; b-p; c-s; d-t **2)** a-p; b-r; c-q; d-s

3) a-p; b-q; c-r; d-s **4)** a-s; b-q; c-r; d-p

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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 L be a common tangent line to the curves $\frac{x^2}{9}+\frac{y^2}{4}=1$ and $x^2+y^2=\frac{31}{4}$. Then, the square of the slope of the line L is _____

22. If A and B are the two real values of k for which the system of equations $x+2y+z=1, x+3y+4z=k, x+5y+10z=k^2$ is consistent, then A^2+B^2 is_____

23. Let $f:(0,\pi)\to R$ be a function given by $f(x)=\begin{cases}\sin^2 x, & 0<x<\frac{\pi}{2}\\ a-8, & x=\frac{\pi}{2}\\ \left(1+|\cot x|\right)^{\frac{b}{a}|\tan x|}, & \frac{\pi}{2}<x<\pi\end{cases}$ where $a,b\in Z$. If f is continuous at $x=\pi/2$, then a^2+b^2 is equal to ____

24. If $\alpha=\lim\limits_{x\to 0^+}\left(\frac{e^{\sqrt{\tan x}}-e^{\sqrt{x}}}{\sqrt{\tan x}-\sqrt{x}}\right)$ and $\beta=\lim\limits_{x\to 0^+}(1+\sin x)^{\frac{1}{2}\cot x}$ are the roots of the quadratic equation $ax^2+bx-\sqrt{e}=0$, then $24\log_e(a+b)$ is equal to ____

25. If getting a head on a fair coin when it is tossed is considered as success, then the probability of having more number of failures when ten fair coins are tossed simultaneously is k, then $512k$ is _____

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PHYSICS **Max Marks: 100**

SECTION-I (SINGLE CORRECT ANSWER TYPE)

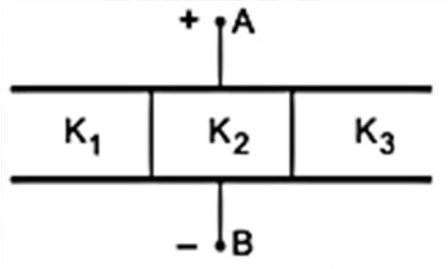
This section contains **20 Multiple Choice Questions.** Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

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

26. Two charged conducting spheres of radii a and b are connected to each other by a conducting wire. The ratio of charges of the two spheres respectively is:

1) $\frac{a}{b}$ **2)** $\frac{b}{a}$ **3) 1** **4)** ab

27. The space between the plates of a parallel plate capacitor of capacitance C is filled with three dielectric slabs of identical sizes as shown in figure. If the dielectric constants of the three slabs are K_1, K_2 *and* K_3 . Find the new capacitance.



1) $\frac{C}{3}\left(K_1K_2 + K_2K_3 + K_3K_1\right)$ **2)** $\frac{C}{3}\left(\frac{1}{K_1} + \frac{1}{K_2} + \frac{1}{K_3}\right)$

3) $\frac{C}{3}\left(K_1K_2K_3\right)$ **4)** $\frac{C}{3}\left(K_1 + K_2 + K_3\right)$

28. In a meter bridge, a standard resistor of $R\Omega$ is connected in the left gap and the two wires A and B are connected one after the other in the right gap. The balancing length measured from the left is 50 cm for either of them. If the two wires are connected in series and put in the right gap, balancing length measured from left would be (in cm)

1) 1 **2)** 33.3 **3)** 55.7 **4)** 100

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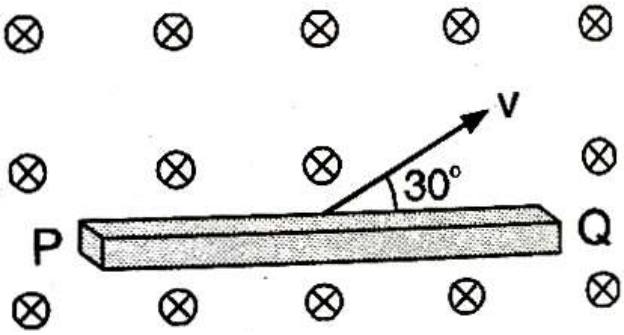
29. A conducting rod PQ of length $l = 2\,m$ is moving at a velocity $\upsilon = 8\ ms^{-1}$ making an angle 30^0 with its length. A uniform magnetic field $B = 3\ T$ exists in a direction perpendicular to the plane of motion. Then,



1) $V_P - V_Q = 49V$ **2)** $V_P - V_Q = 24V$

3) $V_Q - V_P = 49V$ **4)** $V_Q - V_P = 48V$

30. Assertion A : In series LCR circuit, resonance can take place.
Reason R : Resonance takes place if inductive and capacitive reactances are not equal.

1) A is false but R is true

2) A is true but R is false

3) Both A and R are true and R is the correct explanation of A

4) Both A and R are true but R is NOT the correct explanation of A

31. Statement – I: Work done by friction on a body sliding down an inclined plane is always positive.

Statement – II: Work done is greater than zero, if angle between force and displacement is acute.

1) Both statement I and statement II are correct

2) Statement I is incorrect and statement II is correct

3) Statement I is correct and statement II is incorrect

4) Both statement I and statement II are incorrect

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32. Assertion A: In case of bullet fired from a free gun, the ratio of kinetic energy of gun and bullet is equal to ratio of mass of bullet and gun

Reason R: In the above firing, total momentum of gun+bullet system remains conserved.

1) A is false but R is true

2) A is true but R is false

3) Both A and R are true and R is the correct explanation of A

4) Both A and R are true but R is NOT the correct explanation of A

33. Two particles of mass M and 5M are released in free space with initial separation distance d between them. If they attract each other due to gravitational force only, then the ratio of distances covered by small mass to higher mass just before collision is

1) 6 **2) 4** **3)** 3 **4)** 5

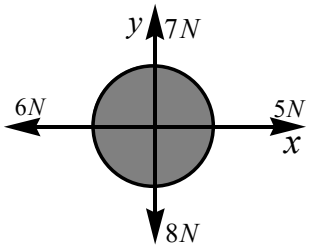
34. If F is force, V is velocity H is latent heat, and s is specific heat, then match the quantity given in Column I with the dimensions given in Column II.

Column – I		Column – II	
i.	F	**a.**	L^2T^{-2}
ii.	V	**b.**	$L^2T^{-2}K^{-1}$
iii.	H	**c.**	MLT^{-2}
iv.	s	**d.**	$L\,T^{-1}$

1) $i \to c, ii \to d, iii \to a, iv \to b$ **2)** $i \to a, ii \to b, iii \to c, iv \to d$

3) $i \to d, ii \to a, iii \to b, iv \to c$ **4)** $i \to c, ii \to a, iii \to b, iv \to d$

35. For a free body diagram shown in the figure, the four forces are applied in the 'x'and 'y' directions. What additional force must be applied and at what angle with positive $x-axis$ so that the net acceleration of body is zero?



1) $\frac{2}{\sqrt{3}}N, 30^0$ **2)** $\sqrt{2}N, 135^0$ **3)** $\sqrt{2}N, 45^0$ **4)** $2N, 45^0$

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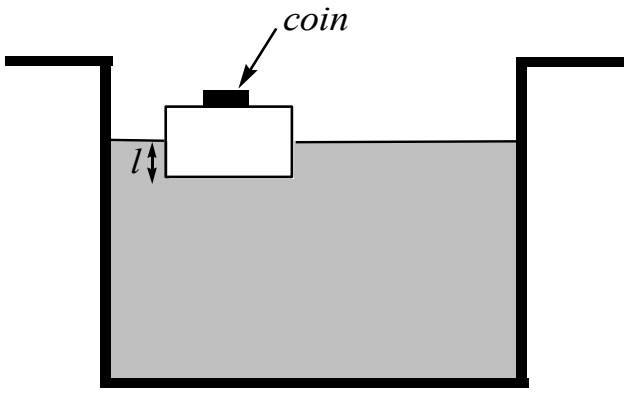
36. The kinetic energy needed to project a body of mass m from the earth's surface to infinity is (R is the radius of the earth)

1) $\frac{1}{4}mgR$ **2)** $\frac{1}{2}mgR$ **3)** mgR **4)** $2mgR$

37. Pressure inside a soap bubble is greater than the pressure outside by an amount:
(given : R= Radius of bubble, S= Surface tension of bubble)

1) $\frac{S}{R}$ **2)** $\frac{4S}{R}$ **3)** $\frac{3R}{S}$ **4)** $\frac{6R}{S}$

38. A wooden block, with a coin placed on its top, floats in water as shown in the figure. The distance l is shown here. After some time, the coin falls into the water. Then



1) l decreases **2)** l increases
3) l remains constant **4)** can not be said

39. The Thermodynamic process, in which internal energy of the system remains constant is

1) Isothermal **2)** Adiabatic **3)** Isobaric **4)** Isochoric

40. The volume of an ideal gas $(\gamma = 1.5)$ is changed adiabatically from 5 litres to 4 litres. The ratio of initial pressure to final pressure is:

1) $\frac{4}{5}$ **2)** $\frac{8}{5\sqrt{5}}$ **3)** $\frac{2}{\sqrt{5}}$ **4)** $\frac{16}{25}$

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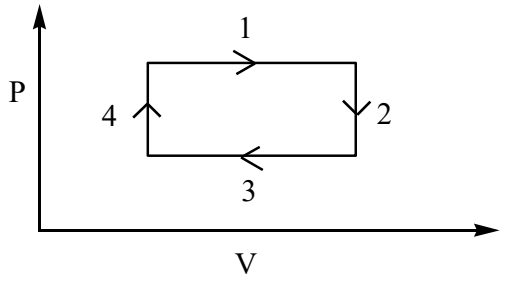
41. An ideal gas undergoes a four step cycle as shown in the P-V diagram below. During this cycle, positive work is done by the gas in



1) step 1 **2)** step 2 **3)** step 3 **4)** step 4

42. Statement – I : The formula connecting u, v and f for a spherical mirror is valid for mirrors whose sizes are very small compared to their radii of curvature.

Statement – II : Laws of reflection are strictly valid for plane surfaces, but not for large spherical surfaces.

1) Statement I is correct and statement II are correct

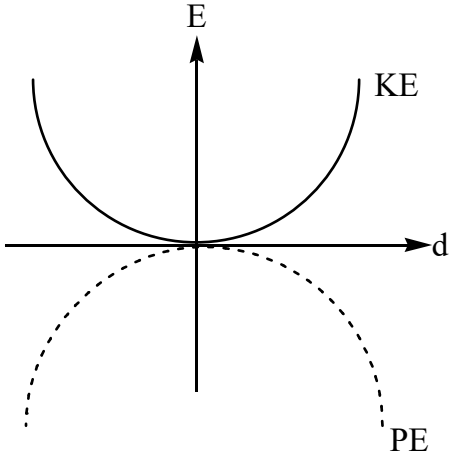
2) Statement I is incorrect and statement II is correct

3) Statement I is correct and statement II is incorrect

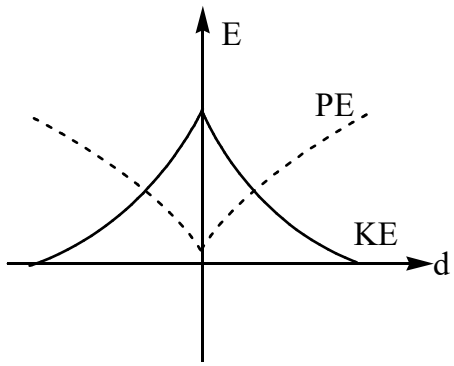
4) Both statement I and statement II are incorrect

43. For a simple pendulum, a graph is plotted between its kinetic energy (KE) and potential energy (PE) against its displacement d. Which one of the following represents these correctly? (graphs are schematic and not drawn to scale)

1)



2)



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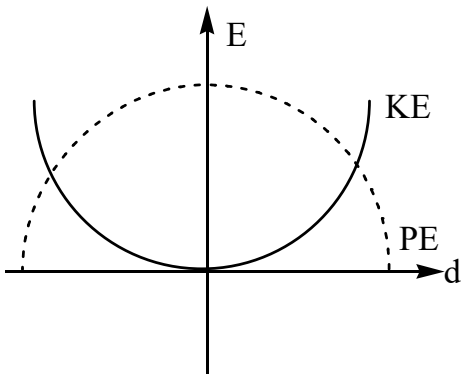
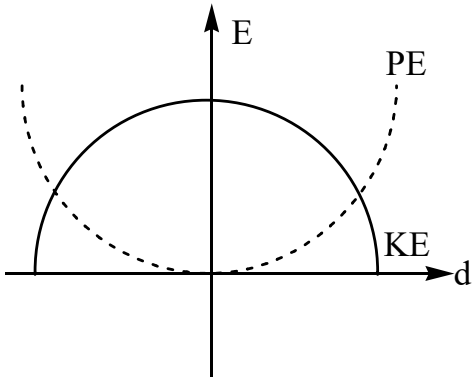


3)



4)

44. A tuning fork A of unknown frequency produces 5 beats/s with a fork of known frequency 340 Hz. If frequency of fork A is lower than that of the other, what is the original frequency of fork A?

1) 335 Hz **2)** 338 Hz **3)** 345 Hz **4)** 342 Hz

45. A particle is travelling 4 times as fast as an electron. Assuming the ratio of de-Broglie wavelength of a particle to that of electron is 2:1, the mass of the particle is

1) 16 times the mass of e^- **2)** 8 times the mass of e^-

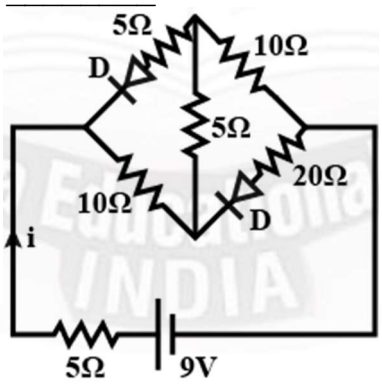
3) $\frac{1}{16}$ times the mass of e^- **4)** $\frac{1}{8}$ times the mass of e^-

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. The current i in the network is _____ $\times 10^{-1}\,A$



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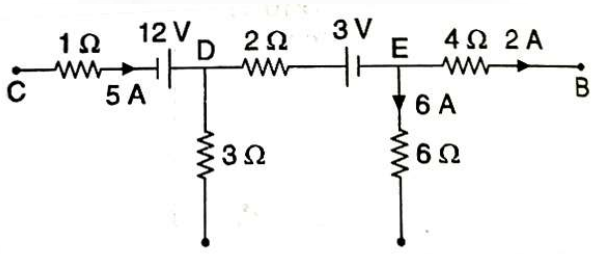
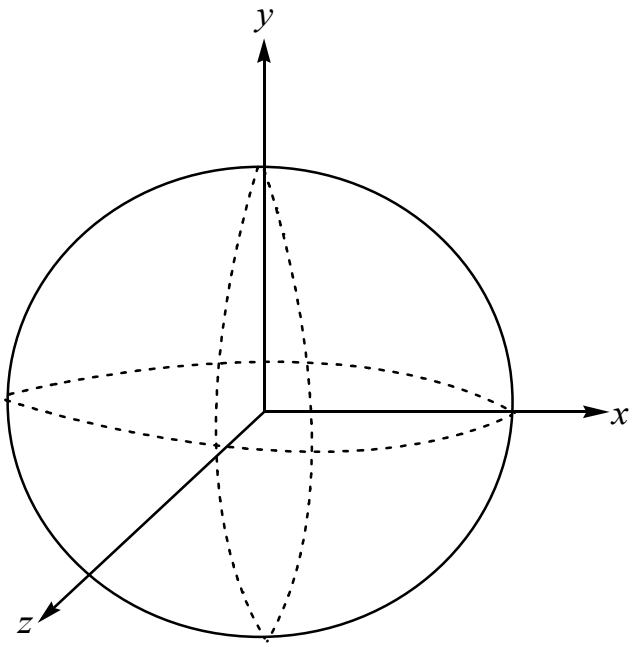
47. Figure shows part of a circuit. What is the potential difference $V_C - V_B =$ _____ V



48. Three rings, each having equal radius R and carrying a current I are placed mutually perpendicular to each other such that each has its centre at the origin of coordinate system. The magnitude of the magnetic field at the common centre is $\sqrt{k}\left(\frac{\mu_0 I}{2R}\right)$. Then the value of k is



49. A solid spherical body of density ρ is floating half-immersed in a liquid of density d. Neglect the effects of surface tension. Then $\frac{d}{\rho}$ is _____

50. Two coherent sources of light interfere. The intensity ratio of two sources is 1:4. For this interference pattern , the value of $\frac{I_{max}}{I_{min}}$ is_____

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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.

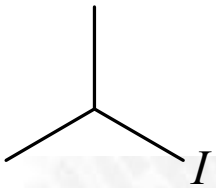
51. Match the terms given in column I with the units given in column II

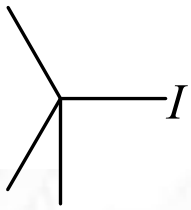
	Column I		Column II
a)	Molar conductance $(\wedge_m)$	P)	$S\ cm^{-1}$
b)	Emf of cell (E_{cell})	q)	m^{-1}
c)	Specific conductance (K)	r)	$S\ cm^2 mol^{-1}$
d)	Cell const (G^*)	s)	Volt (V)

1) a-r; b-s; c-p; d-q **2)** a-s; b-r; c-q; d-p

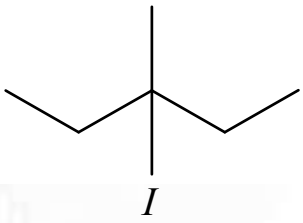
3) a-r; b-s; c-q; d-p **4)** a-s; b-r; c-p; d-q

52. Which among the following compounds will undergo fastest SN^2 reaction

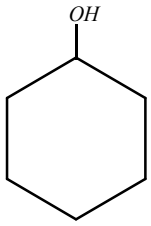
1) 

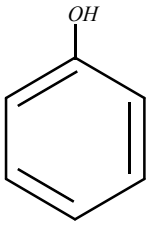
2) 

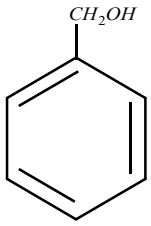
3) $CH_3 - I$

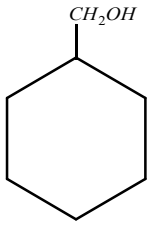
4) 

53. A compound 'X' is acidic and it is soluble in $NaOH$ solutions, but insoluble in $NaHCO_3$ solution. Compound 'X' also gives violet colour with neutral $FeCl_3$ solutions. The compound 'X'is :

1) 

2) 

3) 

4) 

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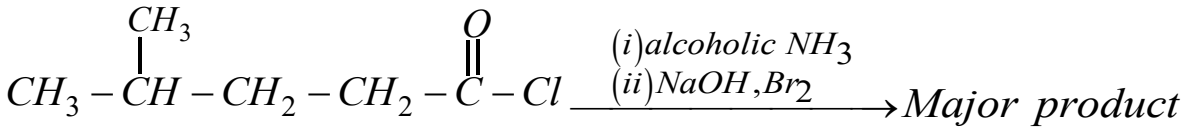
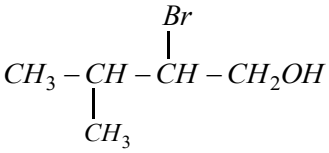
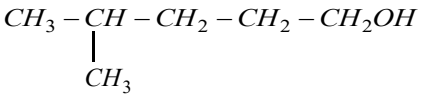
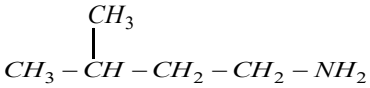
54. The major product of the following reaction is:

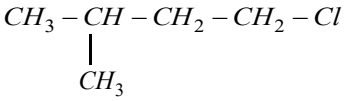


$$CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-CH_2-\overset{\displaystyle O}{\overset{\|}{C}}-Cl \xrightarrow[(ii)NaOH,Br_2]{(i)alcoholic\ NH_3} Major\ product$$

1) 

2) 

3) 

4) 

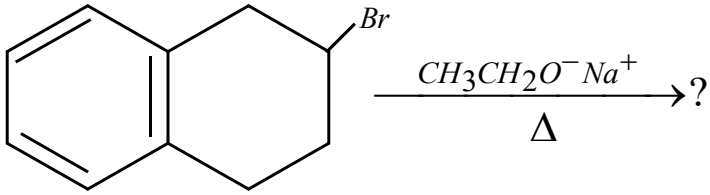
55. For electrode reaction

$$Al^{3+}+3e^-\rightarrow Al(s)$$

How many moles of electrons are required by 1 mole of Al^{3+} ions for complete reduction.

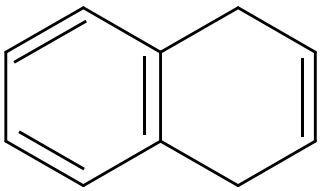
1) 1 **2)** 2 **3)** 3 **4)** 4

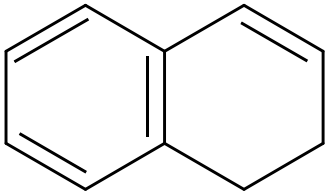
56. The reaction,



$$\xrightarrow[\Delta]{CH_3CH_2O^-Na^+} ?$$

Gives as the major elimination product

1) 

2) 

3) equal amounts of (1) and (2) **4)** Neither (1) nor (2)

57. Calculate the mass of lime (CaO) obtained by heating 200 kg of 95% lime stone $(CaCO_3)$:

1) 104.4 kg **2)** 105.4 kg **3)** 212.8 kg **4)** 112 kg

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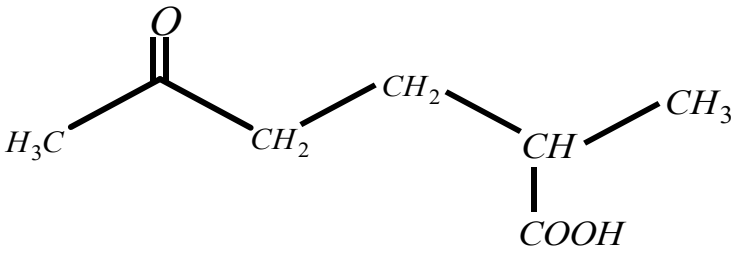
58. The correct IUPAC nomenclature for the following compound is



1) 2-methyl-5-oxo hexanoic acid
2) 5-formyl-2-methyl hexanoic acid
3) 2-Formyl-5-methyl hexan-6-oic acid
4) 5-methyl-2-oxo hexan-6-oic acid

59. Assertion: Addition of $HCl(aq.)$ to $HCOOH(aq.)$ decrease the dissociation of $HCOOH(aq.)$.

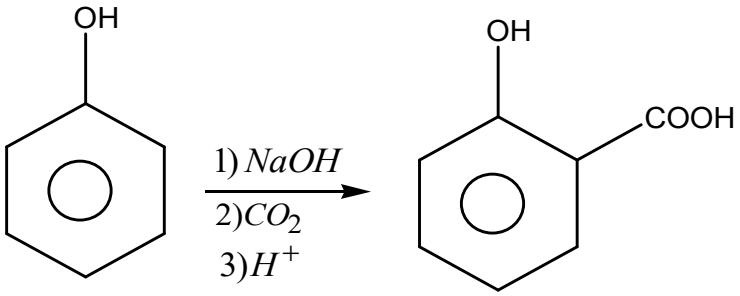
Reason: Due to common ion effect of H^+, dissociation of $HCOOH$ decrease.

1) If both Assertion and Reason are true Reason is the correct explanation of Assertion
2) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion
3) If Assertion is true and Reason is false
4) If Assertion is false and Reason is true

60. The conjugate base for bicarbonate ion$\left(HCO_3^-\right)$ is

1) CO_3^{2-} **2)** HCO_3^- **3)** CO_2 **4)** H_2CO_3

61.



, then the name of this reaction is

1) Stephen reaction **2)** Etard reaction
3) Reimer-tieman reaction **4)** Kolbe's reaction

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62. The freezing point of equimolal aqeous solutions will be highest for:

1) $NaCl$ **2)** $Ca(NO_3)_2$ **3)** $AlCl_3$ **4)** $C_6H_{12}O_6$

63. What is the total energy of the electron in first orbit of H-atom?

1) -13.6eV **2)** -27.2eV **3)** -1.51eV **4)** 13.6eV

64. Which of the following statements is incorrect?

1) In $[SiF_6]^{2-}$, $[GeCl_6]^{2-}$ and $[Sn(OH)_6]^{2-}$; the central atoms are in sp^3d^2 hybridized state

2) Both Carbon and Silicon cannot exceed their covalence more than four

3) Lead is more stable in +2 oxidation state due to inert pair effect

4) In group-14 carbon has unique ability of forming $p\pi - p\pi$ multiple bonds with itself and also with small sized atom like O, N etc.

65. Which of the following exhibit only optical isomerism?

(Given that: en= $NH_2CH_2CH_2NH_2, gly = NH_2CH_2COO^-$)

1) $[Co(en)_3]^{+3}$ **2)** $[Co(NH_3)_4Cl_2]^+$

3) $[Cr(gly)_3]$ **4)** $[Co(NH_3)_3Cl_3]$

66. Which of the following is a square planar complex ?

1) $[Ni(CN)_4]^{2-}$ **2)** $[NiCl_4]^{2-}$ **3)** $[Ni(CO)_4]$ **4)** $[CoCl_4]^{2-}$

67. Which of the following is an example of double salt

1) $[Rh(PPh_3)_3Cl]$ (Wilkinson's catalyst)

2) $[Fe(H_2O)_5NO]SO_4$ (Brown ring complex)

3) $FeSO_4(NH_4)_2SO_4.6H_2O$ (Mohr's salt)

4) $NaOH$ (caustic soda)

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68. The correct statements from the following are:

A) The increasing order of atomic radii of group 13 elements is $B < Al < Ga < In < Tl$.

B) Al dissolves in dil. HCl and liberate H_2 but conc. HNO_3 renders Al passive by forming a protective oxide layer on the surface.

C) All elements of group 13 exhibits highly stable + 1 oxidation state.

D) Hybridisation of Al in $\left[Al\left(H_2O\right)_6\right]^{3+}$ ion is sp^3d^2.

Choose the correct answer from the options given below:

1) (B) and (D) only **2)** (A) and (C) only

3) (A), (B) and (C) only **4)** (A) and (B) only

69. **Assertion (A):** The bond angles of the hydrides decreases in the order

$NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$.

Reason (R): The Lewis basic strength of the hydrides increases in the order

$NH_3 < PH_3 < AsH_3 < SbH_3$.

1) Both A and R are correct and R is the correct explanation of A

2) Both A and R are correct and R is not the correct explanation of A

3) A is correct but R is incorrect

4) A is incorrect but R is correct

70. Which of the following order is correct?

1) $E^\circ_{F_2/2F^-} < E^\circ_{Cl_2/2Cl^-} < E^\circ_{Br_2/2Br^-} < E^\circ_{I_2/2I^-} : E^\circ_{values}\left(SRP\ \ values\right)$

2) $I > Br > Cl > F$; Electron affinity

3) $F^- > Cl^- > Br^- > I^-$; $\left|Hydration\ enthalpy\right|$

4) $F_2 > Cl_2 > Br_2 > I_2$; Bond dissociation enthalpy

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

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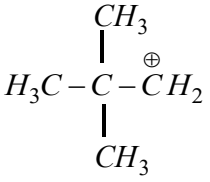


71. Number of H-atoms involved in hyper conjugation in the following is

72. Oxidation state of Sulphur in sulphuric acid (H_2SO_4) is x .Find $|x|$

73. Consider the following oxides; $N_2O, NO, CO, CO_2, N_2O_5, Al_2O_3, ZnO, V_2O_5$

If

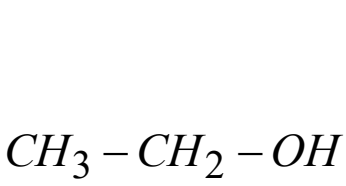
X = number of neutral oxides,

Y = number of acidic oxides

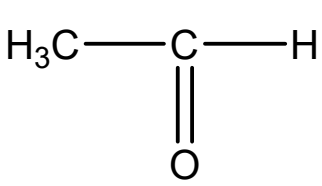
Z = number of an amphoteric oxides

Then [(X+Y)–(Z)] is_____.

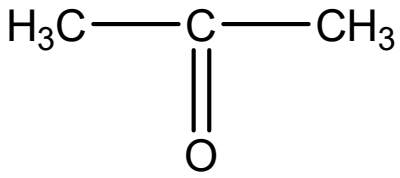
74. How many of the following compounds give iodoform test when reacted with $I_2 + NaOH$?



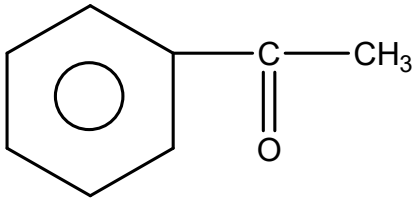
(I) ,



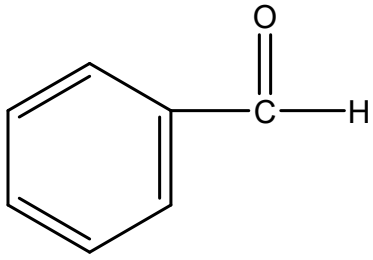
(II) ,



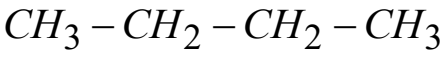
(III) ,



(IV) ,



(V) ,



(VI) ,

75. If enthalpy of neutralization of HCl by $NaOH$ is $-57 kJmol^{-1}$ and with NH_4OH is $-50 kJ\ mol^{-1}$ calculate enthalpy of Ionisation of $NH_4OH(aq)$.

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G N NIRMALKUMAR Appl.No. 240310385062*	REDDI ANIL Appl.No. 240310238514*	K C BASAVA REDDY Appl.No. 240310618179*	THOTAMSETTY NIKILESH Appl.No. 240310813888*	A V TANISH REDDY Appl.No. 240310807613	HIMANSHU THALOR Appl.No. 240310580429*	VEDANT SAINI Appl.No. 240310182830	P MEET VIKRAMBHAI Appl.No. 240310157524*		
34 RANK	40 RANK	43 RANK	46 RANK	49 RANK	52 RANK	53 RANK	57 RANK		
SANVI JAIN Appl.No. 240310150036*	VISHARAD SRIVASTAVA Appl.No. 240310046262*	T JAYADEV REDDY Appl.No. 240310167365	ISHAAN GUPTA Appl.No. 240310100229*	MAVURU JASWITH Appl.No. 240310542275*	DORISALA SRINIVASA REDDY Appl.No. 240310682440*	ARCHIT RAHUL PATIL Appl.No. 240310512311*	KRISHNA AGRAWAL Appl.No. 240310285850*		
60 RANK	68 RANK	70 RANK	76 RANK	92 RANK	93 RANK	95 RANK	96 RANK	98 RANK	
AYUSH GANGAL Appl.No. 240310270709	PALAGIRI SATHISH REDDY Appl.No. 240310905497	MD K GHOUSE MOHIUDDIN Appl.No. 240310176352	T V S SAI NAGA BHUSHAN Appl.No. 240310868568	M M PRUTHVI RAJ Appl.No. 240311084545	M SAI SIVA LOCHAN Appl.No. 240310866829*	RAJDEEP MISHRA Appl.No. 240310265621*	MANOJ SOHAN GAJULA Appl.No. 240310529661	KRISH NARSARIA Appl.No. 240310028286*	

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