04-04-2026

JEE MAIN

SHIFT - 01

PHYSICS | CHEMISTRY | MATHEMATICS

Time : 3 Hours • Maximum Marks : 300

IMPORTANT INSTRUCTIONS

1. The test is of 3 hours duration.
2. This test paper consists of 75 questions. Each subject (PCM) has 25 questions. The maximum marks are 300.
3. This question paper contains Three Parts. Part-A is Physics, Part-B is Chemistry and Part-C is Mathematics. Each part has only two sections: Section-A and Section-B.
4. Section - A : Attempt all questions.
5. Section - B : Attempt all questions.
6. Section - A (01 - 20) contains 20 multiple choice questions which have only one correct answer. Each question carries +4 marks for correct answer and –1 mark for wrong answer.
7. Section - B (21 - 25) contains 5 Numerical value-based questions (MCQ). The answer to each question should be rounded-off to the nearest integer. Each question carries +4 marks for correct answer and –1 mark for wrong answer.

SECTION-A

1. In a screw gauge when the circular scale is given five complete rotations it moves linearly by 2.5 mm. If the circular scale has 100 divisions, the least count of screw gauge is_____ mm.

(a) 1×10^{-2} (b) 1×10^{-3}

(c) 5×10^{-2} (d) 5×10^{-3}

2. The increase in the pressure required to decrease the volume (ΔV) of water is 6.3×10^{7} N/m^2. The percentage decrease in the volume is_____. (Bulk modulus of water = 2.1×10^{9} N/m^2.)

(a) 2% (b) 3%

(c) 6% (d) 4%

3. The time taken by a block of mass m to slide down from the highest point to the lowest point on a rough inclined plane is 50% more compared to the time taken by the same block on identical inclined smooth plane. Both inclined planes are at 45° with the horizontal. The coefficient of kinetic friction between the rough inclined surface and block is

(a) $\frac{3}{4}$ (b) $\frac{2}{3}$

(c) $\frac{5}{9}$ (d) $\frac{4}{9}$

4. Two nuclei of mass number 3 combine with another nucleus of mass number 4 to yield a nucleus of mass number 10. If the binding energy per nucleon for the mass numbers 3, 4 and 10 are 5.6 MeV, 7.4 MeV and 6.1 MeV, respectively, then in the process, ΔMc^2 = _____ MeV.

(a) 6.9 (b) 7.9

(c) 2.2 (d) 4.3

5. A solid sphere of mass M and radius R is divided into two unequal parts. The smaller part having mass $\frac{M}{8}$ is converted into a sphere of radius r and the larger part is converted into a circular disc of thickness t and radius 2R. If I_1 is moment of inertia of a sphere having radius r about an axis through its centre and I_2 is the moment of inertia of a disc about its diameter, the ratio of their moment of inertia $\frac{I_2}{I_1}$ = _____.

(a) 35 (b) 70

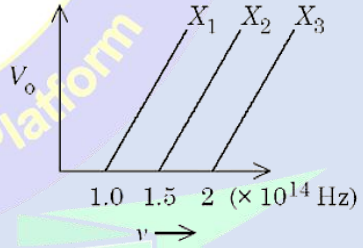
(c) 140 (d) 210

6. The two projectiles are projected with the same initial velocities at the 15° and 30° with respect to the horizontal. The ratio of their ranges is 1 : x. The value of x is

(a) $\sqrt{2}$ (b) $\sqrt{3}$

(c) $2\sqrt{3}$ (d) $\frac{1}{\sqrt{2}}$

7. The graph shows variation of stopping potential V_0, with the frequency v of the incident radiation for three photosensitive metals X_1, X_2 and X_3. Which metal will give out electrons with greater kinetic energy, for the same wavelength of incident radiation?



(a) X_1

(b) X_2

(c) X_3

(d) All the metals will give out photo electrons with same kinetic energies.

8. A slit of width a is illuminated by light of wavelength λ. The linear separation between 1st and 3rd minima in the diffraction pattern produced on a screen placed at a distance D from the slit system is _____.

(a) $\frac{D\lambda}{a}$ (b) $1.5\frac{D\lambda}{a}$

(c) $\frac{2D\lambda}{a}$ (d) $\frac{3D\lambda}{a}$

9. A string A of length 0.314 m and Young's modulus 2×10^{10} N/m^2 is connected to another string B of length and Young's modulus both twice of those of A. This series combination of strings is then suspended from a rigid support and its free end is fixed to a load of mass 0.8 kg. The net change in length of the combination is _____ mm. (radius of both the strings is 0.2 mm and acceleration due to gravity = 10 m/s^2)

(a) 3 (b) 2
(c) 1.9 (d) 1

10. One gas of n_1 mole of molecules at temperature T_1, volume V_1, and pressure P_1, and another gas of n_2 mole of molecules at temperature T_2, volume V_2, and pressure P_2, are mixed resulting in pressure P and volume V of the mixture. The temperature of the mixture is _____.

(a) $\frac{(T_1+T_2)}{2}$ (b) $\frac{T_1T_2PV}{(T_2P_1V_1+T_1P_2V_2)}$
(c) $\frac{(T_2P_1V_1+T_1P_2V_2)}{T_1T_2PV}$ (d) $\frac{|T_1-T_2|}{2}$

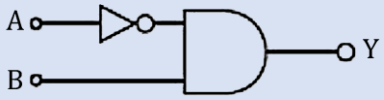
11. An ideal gas undergoes a process maintaining relation between pressure (P) and volume (V) as $P = P_o\left(1+\left(\frac{V_o}{V}\right)^2\right)^{-1}$, where P_o and V_o are constants. If two samples A and B (two moles each) with initial volumes V_o and $3V_o$ respectively undergo above mentioned process and attain same pressure, then the difference at the temperatures of these samples, $T_B - T_A$ is _____. (R = gas constant)

(a) $\frac{9P_0V_0}{8R}$ (b) $\frac{11P_0V_0}{10R}$
(c) $\frac{7P_0V_0}{6R}$ (d) $\frac{13P_0V_0}{11R}$

12. A voltmeter with internal resistance of x Ω can be used to measure upto 20 V. In order to increase its measuring range to 30 V, the required modification is to _____.

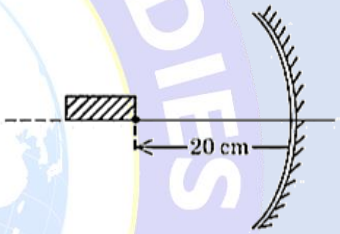
(a) connect resistor of $\frac{x}{2}$ Ω, in series with voltmeter.
(b) connect resistor of $\frac{x}{2}$ Ω, in parallel to voltmeter.
(c) connect a resistor of x Ω in series with voltmeter.
(d) connect resistor of 2x Ω in parallel to voltmeter.

13. Two 4 bits binary numbers, A = 1101 and B = 1010 are given in the inputs of a logic circuit shown in figure below. The output (Y) will be:



(a) Y = 1101 (b) Y = 0010
(c) Y = 0111 (d) Y = 1000

14. A rod of length 10 cm lies along the principle axis of a concave mirror of focal length 10 cm as shown in figure. The length of the image is _____ cm.



(a) 2.5 (b) 5
(c) 7.5 (d) 7

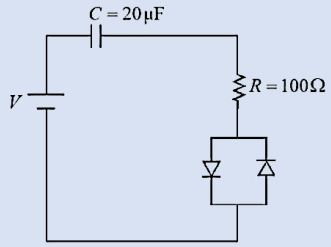
15. A parallel plate air capacitor is connected to a battery. The plates are pulled apart at uniform speed v. If x is the separation between the plates at any instant, then the time rate of change of electrostatic energy of the capacitor is proportional to x^α, where α is _____.

(a) –2 (b) 1
(c) –1 (d) 2

16. An insulated wire is wound so that it forms a flat coil with N = 200 turns. The radius of the innermost turn is r_1 = 3 cm, and of the outermost turn r_2 = 6 cm. If 20 mA current flows in it then the magnetic moment will be $\alpha \times 10^{-2}$ A.m^2. The value of α is _____.

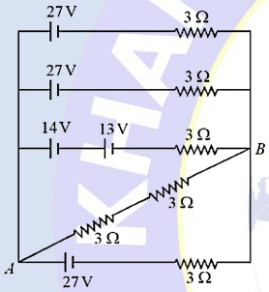
(a) 4.4 (b) 2.64
(c) 3.25 (d) 1.2

17. Consider a circuit consisting of a capacitor (20 μF), resistor (100 Ω) and two identical diodes as shown in figure. The resistance of diode under forward biasing condition is 10 Ω. The time constant of the circuit is $\alpha \times 10^{-3}$ s. The value of α is _____.



(a) 2.2 (b) 2.0
(c) 2.1 (d) 2.4

18. The voltage and the current between A and B points shown in the circuit are _____.

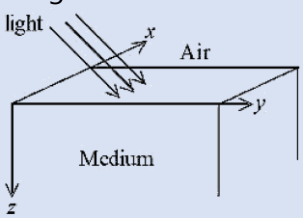


(a) 24 V, 12 A (b) 24 V, 4 A
(c) 18 V, 12 A (d) 27 V, 4 A

19. A telescope with objective diameter R is used to observe a distant star emitting light of wavelength 500 nm, at a resolution of 5×10^{-7} radian. The value of R is _____ cm.

(a) 61 (b) 122
(c) 244 (d) 305

20. An unpolarized light is incident on the plane interface of air-dielectric medium shown in figure. If the incident angle is equal to Brewster angle, identify the expression representing reflected wave.



(a) $\left(E_x\hat{i} + E_y\hat{j}\right)\sin(kx - kz - wt)$
(b) $\left(E_x\hat{i} + E_z\hat{k}\right)\sin(kx + ky - wt)$
(c) $\left(E_x\hat{j} + E_y\hat{k}\right)\sin(ky + kz - wt)$
(d) $\left(E_x\hat{i} + E_y\hat{j} + E_z\hat{k}\right)\sin(kx + ky - kz - wt)$

SECTION-B

21. A 1 kg block subjected to two simultaneous forces $(2\hat{i} + 3\hat{j} + 4\hat{k})$ N and $(3\hat{i} - \hat{j} - 2\hat{k})$ N is moved a distance of 25 m along the $(3\hat{i} - 4\hat{j})$ direction. The work done in this process is _____ J.

22. The surface tension of a soap solution is 3.5×10^{-2} N/m. The work required to increase the radius of a soap bubble from 1 cm to 2 cm is $\alpha \times 10^{-6}$ J. The value of α is _____. (π=22/7)

23. The velocity of a particle executing simple harmonic motion along x-axis is described as $v^2 = 50 - x^2$, where x represents displacement. If the time period of motion is $\frac{\pi}{7}$ s, the value of x is _____.

24. A body of mass 2 kg begins to move under the influence of time dependent force $\vec{F} = (2t\hat{i} + 6t^2\hat{j})$ N, where $\hat{i}$ and $\hat{j}$ are unit vectors along x and y-axis respectively. The power produced by the force at t = 2 s is _____ W.

25. An inductor of 10 mH, capacitor of 0.1 μF and a resistor of 100 Ω are connected in series across an a.c power supply 220 V, 70 Hz. The power factor of the given circuit is 0.5. The difference in the inductive reactance and capacitance reactance is $\sqrt{3}a\ \Omega$. The value of α is _____.

SECTION-A

26. Number of moles and number of molecules in 1.4187 L of SO_2 at STP respectively are

(a) 0.1266; 3.812×10^{22}

(b) 0.0633; 3.812×10^{22}

(c) 0.1266; 7.6238×10^{22}

(d) 0.0633; 7.6238×10^{22}

27. What is the ratio of wave number of first line (lowest energy line) of Balmer series of H atomic spectrum to first line of its Brackett series?

(a) 5 : 1 (b) 5 : 0.81

(c) 5 : 1.75 (d) 5 : 27

28. Which of the following is correct set of 4 quantum numbers of 19^{th} electron in Chromium (Atomic number = 24) in accordance with Aufbau principle?

(a) $n = 3, l = 2, m = +2, s = +\frac{1}{2}$

(b) $n = 3, l = 2, m = -2, s = +\frac{1}{2}$

(c) $n = 4, l = 1, m = 0, s = +\frac{1}{2}$

(d) $n = 4, l = 0, m = 0, s = +\frac{1}{2}$

29. **Statement-I:** For an ideal gas, heat capacity at constant volume is always greater than the heat capacity at constant pressure.
Statement-II: In a constant volume process, no work is produced and all the heat withdrawn goes into the chaotic motion and is reflected by a temperature increase of the ideal gas.
In the light of the above statements, choose the correct answer**:**

(a) Both Statement I and Statement II are true

(b) Both Statement I and Statement II are false

(c) Statement I is true but Statement II is false

(d) Statement I is false but Statement II is true

30. At T(K), the equilibrium constant of $A_2(g) + B_2(g) \rightleftharpoons C(g)$ is 2.7×10^{-5}.
What is the equilibrium constant for $\frac{1}{3}A_2(g) + \frac{1}{3}B_2(g) \rightleftharpoons \frac{1}{3}C(g)$ at the same temperature?

(a) $(2.7 \times 10^{-5})^3$ (b) 6×10^{-2}

(c) $\sqrt{2.7 \times 10^{-5}}$ (d) 3×10^{-2}

31. In order to oxidise a mixture of 1 mole each of FeC_2O_4, $Fe_2(C_2O_4)_3$, $FeSO_4$ and $Fe_2(SO_4)_3$ in acidic medium, the number of moles of $KMnO_4$ required is

(a) 3 (b) 2

(c) 5 (d) 7

32. Consider the first order reaction R → P. The fraction of molecules decomposed in the given first order reaction can be expressed as

(a) $1 - e^{k_1 t}$ (b) $1 + e^{k_1 t}$

(c) $1 + e^{-k_1 t}$ (d) $1 - e^{-k_1 t}$

33. A monoatomic anion (A^-) has 45 neutrons and 36 electrons. Atomic mass, group in the periodic table and physical state at room temperature of the element (A) respectively are

(a) 80, 17, liquid (b) 81, 16, liquid

(c) 80, 16, gas (d) 81, 15, gas

34. **Statement-I:** The covalency of oxygen is generally two but it can exceed up to four. The oxidation state of oxygen in SO_2 is –2 and in OF_2 it is +2.
Statement-II: The anomalous behaviour of oxygen when compared to the other elements of group 16 is due to its small size and high electronegativity.
In the light of the above statements, choose the correct answer:

(a) Both Statement I and Statement II are true

(b) Both Statement I and Statement II are false

(c) Statement I is true but Statement II is false

(d) Statement I is false but Statement II is true

35. The correct statements among the following are:

A. Mo(VI) and W(VI) are less stable than Cr(VI).

B. Ce^{4+} and Tb^{4+} are oxidant while Eu^{2+} and Yb^{2+} are reductant.

C. Cm and Am have seven unpaired electrons.

D. Actinoid contraction is greater from element to element than lanthanoid contraction.

Choose the correct answer:

(a) A and B Only (b) C and D Only

(c) B and D Only (d) A and C Only

36. Correct statements from the following are:

A. Potassium dichromate is an oxidising agent and it oxidises $FeSO_4$ to $Fe_2(SO_4)_3$ in acidic medium.

B. Sodium dichromate can be used as primary standard in volumetric estimation.

C. CrO_4^{2-} and $Cr_2O_7^{2-}$ are interconvertible in aqueous solution by varying the pH of the solution.

D. Cr-O-Cr bond angle in CrO_7^{2-} is 126°.

Choose the correct answer:

(a) A, B and C Only (b) A, C and D Only

(c) A and C Only (d) B and D Only

37. Match List-I with List-II.

List -I (Complex ion)

(A) $[Cr(H_2O)_6]^{2+}$

(B) $[Co(H_2O)_6]^{2+}$

(C) $[Cu(H_2O)_6]^{2+}$

(D) $[Mn(H_2O)_6]^{2+}$

List -II (Calculated spin only magnetic moment (BM))

(I) 3.87

(II) 5.92

(III) 4.90

(IV) 1.73

Choose the correct answer from the options given below:

(a) A-I, B-III, C-IV, D-II

(b) A-II, B-I, C-III, D-IV

(c) A-IV, B-II, C-I, D-III

(d) A-III, B-I, C-IV, D-II

38. Increasing order of electron withdrawing power of following functional groups is:

A. –CN B. –COOH

C. $-NO_2$ D. $-I$

(a) C < B < D < A

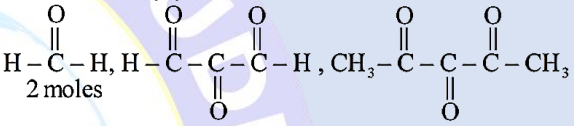
(b) C < A < B < D

(c) D < B < A < C

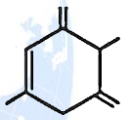
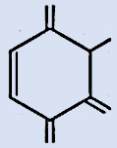
(d) A < B < C < D

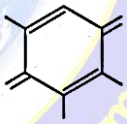
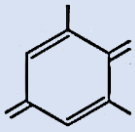
39. An alkene (X) on ozonolysis followed by reduction gives following products.

The alkene (X) is:



The alkene (X) is:

(a)  (b) 

(c)  (d) 

40. Match List-I with List-II.

List -I (Name of reaction)

(A) Finkelstein reaction

(B) Swarts reaction

(C) Sandmeyer's reaction

(D) Fittig reaction

List -II (Reagent or catalyst used)

(I) SbF_3

(II) Na, dry ether

(III) NaI

(IV) Cu_2Cl_2

Choose the correct answer from the options given below:

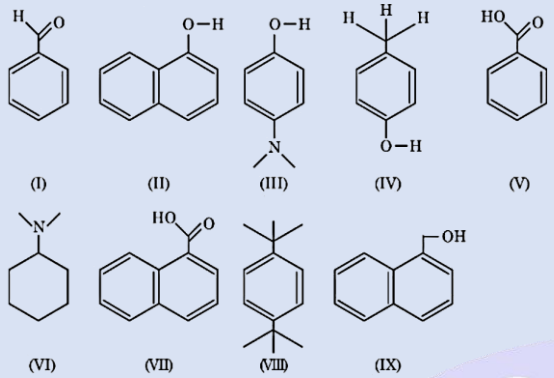
(a) A-I, B-IV, C-III, D-II

(b) A-III, B-I, C-IV, D-II

(c) A-IV, B-II, C-I, D-III

(d) A-I, B-III, C-II, D-IV

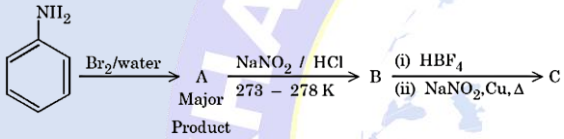
41. Amongst the following, the total number of compounds soluble in aqueous NaOH at room temperature is:



(a) 5 (b) 4

(c) 6 (d) 3

42. Product C of the following reaction sequence will be :



(a) 1-Bromo-4-nitrobenzene

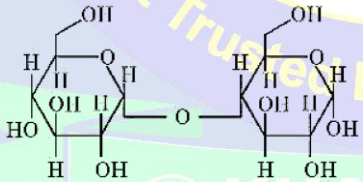
(b) 1, 3, 5-Tribromo-2-nitrobenzene

(c) 4-Bromo-1-nitrobenzene

(d) 1, 3, 5-Tribromobenzene

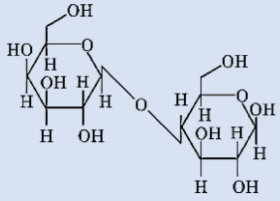
43. Given below are two statements:

Statement-I : The structure of Maltose is given below:



Maltose is a non-reducing sugar.

Statement-II: The structure of Lactose is given below:



Lactose is a reducing sugar.

In the light of the above statements, choose the correct answer from the options given below:

(a) Both Statement I and Statement II are true

(b) Both Statement I and Statement II are false

(c) Statement I is true but Statement II is false

(d) Statement I is false but Statement II is true

44. Match List-I with List-II.

List-I (Name of Amino Acid)

(A) Arginine

(B) Aspartic acid

(C) Lysine

(D) Glutamic acid

List-II (One letter symbol/type)

(I) D/Non-essential

(II) R/Essential

(III) E/Non-essential

(IV) K/Essential

Choose the correct answer from the options given below:

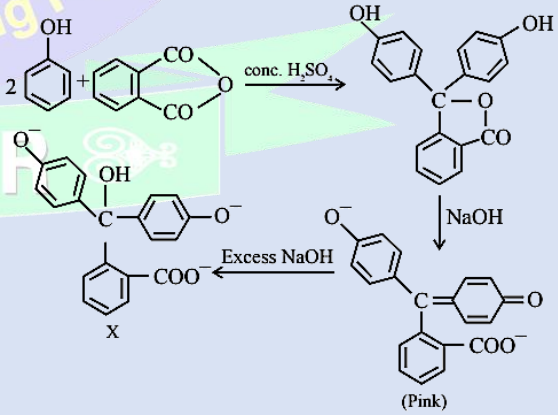
(a) A-II, B-I, C-IV, D-III

(b) A-IV, B-III, C-II, D-I

(c) A-III, B-IV, C-I, D-II

(d) A-II, B-IV, C-I, D-III

45. Identify the colour of compound 'X' in the sequence of the reaction :



(a) Violet

(b) Green

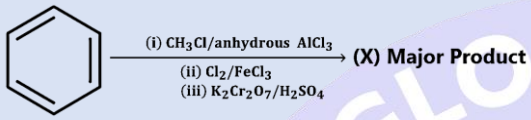
(c) Red

(d) Colourless

SECTION-B

46. According to Lewis theory, the total number of σ bond-pairs and lone pair of electrons around the central atom of $X_eO_6^{4-}$ ion is _____.

47. Consider the following sequence of reactions to give the major product (X). P g of the major product (X) formed is reacted with $NaHCO_3$ solution to liberate a gas which occupied 11.2 dm^3 at STP. P = _____ g.



[Given: molar mass in g mol^{-1}] H : 1, C : 12, O : 16, Cl : 35.5.

48. 2.0 g of a bromo hydrocarbon (X) was subjected to Carius analysis, gave 3.36 g of AgBr. The percentage of carbon in the compound (X) is 26.7%. Total number of carbon atoms in the empirical formula for compound (X) is _____.
(Given molar mass in g mol^{-1} H : 1, C : 12, Br : 80, Ag : 108)

49. The pH of a solution obtained by mixing 5 mL of 0.1 M NH_4OH solution with 250 mL of 0.1 M NH_4Cl solution is _____ × 10^{-2}. (Nearest integer) [Given: $pK_b(NH_4OH)$ = 4.74, log2 = 0.30, log3 = 0.48, log5 = 0.70]

50. A non-volatile, non-electrolyte solid solute when dissolved in 40 g of a solvent, the vapour pressure of the solvent decreased from 760 mmHg to 750 mmHg. If the same solution boils at 320 K, then the number of moles of the solvent present in the solution is _____. (Nearest integer)
[Given: boiling point of the pure solvent = 319.5 K, K_b of the solvent = 0.3 K kg mol^{-1}]

MATHEMATICS

SECTION-A

51. Let [·] denote the greatest integer function. If the domain of the function $f(x) = \cos^{-1}\left(\frac{4x+2[x]}{3}\right)$ is [α, β], then 12 (α + β) is equal to:

(a) 6 (b) 8
(c) 9 (d) 4

52. If the set of all solutions of $|x^2 + x - 9| = |x| + |x^2 - 9|$ is $[\alpha, \beta] \cup [\gamma, \infty)$, then $(\alpha^2+\beta^2+\gamma^2)$ is equal to

(a) 9 (b) 18
(c) 36 (d) 72

53. Let z be a complex number such that $|z + 2| = |z - 2|$ and $\arg\left(\frac{z+3}{z-i}\right) = \frac{\pi}{4}$. Then $|z|^2$ is equal to:

(a) 9 (b) 4
(c) 5 (d) 1

54. The number of functions
f : {1, 2, 3, 4} → {a, b, c}, which are not onto, is:

(a) 48 (b) 45
(c) 51 (d) 35

55. Let $\left\{A = \begin{bmatrix} a & b \\ c & d \end{bmatrix} : a, b, c, d \in \{0,1,2,3,4\} \text{ and } A^2 - 4A + 3I = 0\right\}$
Be a set of 2 × 2 matrices. Then the number of matrices in S, for which the sum of the diagonal elements is equal to 4, is:

(a) 20 (b) 17
(c) 21 (d) 19

56. Let $A = \begin{bmatrix} 1 & 1 & 2 \\ -2 & 0 & 1 \\ 1 & 3 & 5 \end{bmatrix}$. Then the sum of all elements of the matrix adj(adj(2(adjA)$^{-1}$)) is equal to:

(a) 3 (b) 4
(c) –4 (d) –3

57. The first term of an A.P. of 30 non-negative terms is $\frac{10}{3}$. If the sum of this A.P. is the cube of its cube of its last term, then its common difference is:

(a) $\frac{5}{87}$ (b) $\frac{25}{83}$

(c) $\frac{15}{29}$ (d) $\frac{5}{29}$

58. The number of ways, of forming a queue of 4 boys and 3 girls such that all the girls are not together, is:

(a) 5040 (b) 3050

(c) 3410 (d) 4320

59. Let the smallest value of $k \in N$, for which the coefficient of x^3 in

$(1+x)^3 + (1+x)^4 + (1+x)^5 + \ldots + (1+x)^{99} + (1+kx)^{100}, x \neq 0$, is $\left(43n + \frac{101}{4}\right)({}^{100}C_3)$

for same $n \in N$, be p. Then the value of p + n is:

(a) 10 (b) 11

(c) 12 (d) 13

60. Suppose that the mean and median of the non-negative numbers 21, 8, 17, a, 51, 103, b, 13, 67, (a > b), are 40 and 21, respectively. If the mean deviation about the median is 26, then 2a is equal to:

(a) 109 (b) 117

(c) 161 (d) 131

61. Let the line $L_1 : x + 3 = 0$ intersect the lines $L_2 : x - y = 0$ and $L_3 : 3x + y = 0$ at the points A and B, respectively. Let the bisector of the obtuse angle between the lines L_2 and L_3 intersect the line L_1 at the point C.

Then $BC^2 : AC^2$ is equal to:

(a) 5 : 1 (b) 1 : 5

(c) 2 : 3 (d) 3 : 2

62. Let the vertex A of a triangle ABC be (1, 2), and the mid-point of the side AB be (5, –1). If the centroid of this triangle is (3, 4) and its circumcenter is (α, β), then 2I(α + β) is equal to:

(a) 309 (b) 403

(c) 497 (d) 524

63. Suppose that two chords, drawn from the point (1, 2) on the circle $x^2 + y^2 + x - 3y = 0$ are bisected by the y-axis. If the other ends of these chords are R and S, and the mid point of the line segment RS is (α, β), then 6(α + β) is equal to:

(a) 1 (b) 3

(c) 4 (d) 6

64. A line with direction ratios 1, –1, 2 intersects the lines $\frac{x}{2} = \frac{y}{3} = \frac{z+1}{3}$ and $\frac{x+1}{-1} = \frac{y-2}{1} = \frac{z}{4}$ at the points P and Q, respectively. If the length of the line segment PQ is α, then $225\alpha^2$ is equal to:

(a) 1024 (b) 1014

(c) 1104 (d) 1204

65. The square of the distance of the point (–2, –8, 6) from the line $\frac{x-1}{-1} = \frac{y-1}{2} = \frac{z}{-1}$ along the line $\frac{x+5}{1} = \frac{y+5}{-1} = \frac{z}{2}$ is equal to:

(a) 3 (b) 6

(c) 8 (d) 12

66. If $y = \tan^{-1}\left(\frac{3\cos x - 4\sin x}{4\cos x + 3\sin x}\right) + 2\tan^{-1}\left(\frac{x}{1+\sqrt{1-x^2}}\right)$, then $\frac{dy}{dx}$ at $x = \frac{\sqrt{3}}{2}$ is equal to:

(a) 3 (b) –1

(c) 1 (d) 2

67. Let f be a real polynomial of degree n such that $f(x) = f'(x)f''(x)$, for all $x \in \mathbb{R}$. If f(0) = 0, then $36\left(f'(2) + f''(2) + \int_0^2 f(x)dx\right)$ is equal to:

(a) 42 (b) 46

(c) 56 (d) 66

68. The area of the region $\{x, y\}: y \leq \pi - |x|$, $y \leq |x \sin x|, y \geq 0\}$ is :

(a) $1 + \frac{\pi^2}{8}$

(b) $2 + \frac{\pi^2}{4}$

(c) $\frac{\pi^2}{8} - 1$

(d) $4 + \frac{\pi^2}{2}$

69. Let $\int_{-2}^{2}(|\sin x| + [s \sin x])dx = 2(3 - \cos 2) + \beta$, where $[\cdot]$ is the greatest integer function. Then $\beta \sin\left(\frac{\beta}{2}\right)$ equals:

(a) 1 (b) 2

(c) 4 (d) 8

70. Let y= y(x) be the solution of the differential equation $\frac{dy}{dx} = (1 + x + x^2)(1 - y + y^2), y(0) = \frac{1}{2}$. Then (2y (1) – 1) is equal to

(a) $\sqrt{3}\tan\left(\frac{11\sqrt{3}}{6}\right)$

(b) $\frac{\sqrt{3}}{2}\tan\left(\frac{11\sqrt{3}}{12}\right)$

(c) $\sqrt{3}\tan\left(\frac{11\sqrt{3}}{12}\right)$

(d) $\frac{\sqrt{3}}{2}\tan\left(\frac{11\sqrt{3}}{6}\right)$

SECTION-B

71. A coin is tossed 8 times. If the probability that exactly 4 heads appear in the first six tosses and exactly 3 heads appear in the last five tosses is p, then 96p is equal to____.

72. Consider the parabola P : y^2 = 4kx and the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$. Let the line segment joining the points of intersection of P and E, be their latus rectums. If the eccentricity of E is e, then $e^2 + 2\sqrt{2}$ is equal to____.

73. If $A = \frac{\sin 3°}{\cos 9°} + \frac{\sin 9°}{\cos 27°} + \frac{\sin 27°}{\cos 81°}$ & $B = \tan 81° - \tan 3°$, then $\frac{B}{A}$ is equal to_____.

74. Let $\vec{a}_k = (\tan\theta_k)\hat{i} + \hat{j}$ and $\vec{b}_k = \hat{i} - (\cos\theta_k)\hat{j}$, where $\theta_k = \frac{2^{k-1}\pi}{2^n + 1}$, for some $n \in \mathbb{N}, n > 5$. Then the value of $\frac{\sum_{k=1}^{n}|\vec{a}_k|^2}{\sum_{k=1}^{n}|\vec{b}_k|^2}$ is _____.

75. The number of points, at which the function $f(x) = \max\{6x, 2 + 3x^2\} + |x - 1|\cos\left|x^2 - \frac{1}{4}\right|$, $(-\pi, \pi)$, is not differentiable, is_____.

☼☼☼

04-04-2026

JEE MAIN

SHIFT - 01

PHYSICS | CHEMISTRY | MATHEMATICS

Time : 3 Hours • Maximum Marks : 300

ANSWER KEY

PHYSICS

1. (d)	**6.** (b)	**11.** (*)	**16.** (b)	**21.** (35)
2. (b)	**7.** (a)	**12.** (a)	**17.** (a)	**22.** (264)
3. (c)	**8.** (c)	**13.** (a)	**18.** (a)	**23.** (44)
4. (c)	**9.** (b)	**14.** (b)	**19.** (b)	**24.** (200)
5. (b)	**10.** (b)	**15.** (a)	**20.** (a)	**25.** (100)

CHEMISTRY

26. (b)	**31.** (b)	**36.** (b)	**41.** (a)	**46.** (6)
27. (b)	**32.** (d)	**37.** (d)	**42.** (b)	**47.** (78)
28. (d)	**33.** (a)	**38.** (c)	**43.** (d)	**48.** (5)
29. (d)	**34.** (a)	**39.** (d)	**44.** (a)	**49.** (756)
30. (d)	**35.** (c)	**40.** (b)	**45.** (d)	**50.** (5)

MATHEMATICS

51. (a)	**56.** (d)	**61.** (a)	**66.** (c)	**71.** (9)
52. (b)	**57.** (a)	**62.** (c)	**67.** (c)	**72.** (3)
53. (a)	**58.** (d)	**63.** (b)	**68.** (b)	**73.** (2)
54. (b)	**59.** (b)	**64.** (b)	**69.** (b)	**74.** (3)
55. (d)	**60.** (d)	**65.** (b)	**70.** (c)	**75.** (3)