JEE Main Practice Paper

Based on JEE Main Pattern

Generated: December 01, 2025 | Difficulty: Easy

Instructions:
- This paper contains 90 questions (30 per subject).
- Each subject has 20 MCQs and 10 Integer Type questions.
- MCQ: +4 for correct, -1 for incorrect.
- Integer: +4 for correct, 0 for incorrect.
- Time: 3 hours | Maximum Marks: 360

Physics

Section A: Multiple Choice Questions (MCQ)

Q1. As the temperature increases, the Young's modulus of elasticity

(A) changes erratically

(B) decreases

(C) increases

(D) remains unchanged

Q2. If mass is written as $m = kc\ P\ G$ -1 / 2 1 / 2 , then the value of P will be : (Constants have their usual meaning with k a dimensionless constant)

(A) 1/2

(B) 1/3

(C) 2

(D) - 1/3

Q3. A block of mass m is placed on a surface having vertical cross section given by $y = x$ 2 4 . If coefficient of friction is 0.5 , the maximum height above the ground at which block can be placed without slipping is:

(A) 1/4 m

(B) 1/2 m

(C) 1/6 m

(D) 1/3 m

Q4. Conductivity of a photodiode starts changing only if the wavelength of incident light is less than 550 nm. The band gap of photodiode is found to be X 7 eV. The value of X is: (Given h = 6.6 $\times 10^{-34} Js, e = 1.6 \times 10^{-19} C$)

14 10 12 20

The dimensional formula of angular impulse is :

(A) [M L - 2 T - 1]

(B) [M L 2 T - 2]

(C) [M L T - 1]

(D) [M L 2 T - 1]

Below are two assertions: Assertion (I): The maximum force of static friction is influenced by the contact area and is not dependent on the materials involved. Assertion (II): The maximum force of kinetic friction does not rely on the contact area and is dependent on the materials. Based on the above assertions, select the most suitable response from the options provided below:

(A) Statement I is correct but Statement II is incorrect

(B) Statement I is incorrect but Statement II is correct

(C) Both Statement I and Statement II are incorrect

(D) Both Statement I and Statement II are correct

If a polaroid sheet is turned between two crossed polaroids, the intensity of the transmitted light will reach its peak for a rotation of:

(A) 60°30°

(B) 90°45°

The following two statements are provided: Statement-I: The equivalent electromotive force (emf) of two nonideal batteries arranged in parallel is less than either of their individual emfs. Statement-II: The equivalent internal resistance of two nonideal batteries connected in parallel is less than the internal resistance of either battery. Based on the above statements, select the correct answer from the options listed below.

(A) Both Statement-I and Statement-II are false

(B) Statement-I is false but Statement-II is true

(C) Both Statement-I and Statement-II are true

(D) Statement-I is true but Statement-II is false

A beam of unpolarised light with an intensity of I_0 passes through a polaroid A and subsequently through another polaroid B, which is positioned such that its principal plane forms an angle of 45° with respect to that of A. What is the intensity of the light that emerges?

(A) $I_0\,4$

(B) I_0

(C) $I_0\,2$

(D) $I_0\,8$

A coil is placed perpendicular to a magnetic field of 6000 T. When the field is changed to 4000 T in 3 s, an induced emf of 30 V is produced in the coil. If the diameter of the coil is 0.03 m, then the number of turns in the coil is:

(A) 15

(B) 60

(C) 45

(D) 75

Two identical capacitors have same capacitance C . One of them is charged to the potential V and other to the potential $2V$. The negative ends of both are connected together. When the positive ends are also joined together, the decrease in energy of the combined system is :

(A) 1 4 CV 2

(B) 2CV 2

(C) 1 2 CV 2

(D) 3 4 CV 2

The quantity of spectral lines produced by atomic hydrogen when it occupies the energy level is

(A) 3

(B) 1

(C) 6

(D) 0

A current of 150 $\mu A deflects the coil of a moving coil galvanometer through 45°. The current to cause deflect$ radian is

(A) 25 $\mu A 75 \mu A$

(B) 50 $\mu A 100 \mu A$

The refractive index of a prism with an apex angle A is cot $\frac{A}{2}$. What is the angle of minimum deviation?

(C) $\delta_m = 180° - A$

(B) $\delta_m = 180° - 3A$

(C) $\delta_m = 180° - 4A$

(D) $\delta_m = 180° - 2A$

A massless spring gets elongated by amount under a tension of 6 N. Its elongation is under the tension of 8 N. For the elongation of x, the tension in the spring will be,

(A) 40 N

(B) 16 N

(C) 12 N

(D) 22 N

A thin plano convex lens made of glass of refractive index 1.6 is immersed in a liquid of refractive index 1.3. When the plane side of the lens is silver coated for complete reflection, the lens immersed in the liquid.

(A) 0.18 m

(B) 0.22 m

(C) 0.14 m

(D) 0.12 m

In a study involving the photoelectric effect, the potential required to stop the emitted electrons,

(A) increases with increase in the intensity of the incident light

(B) decreases with increase in the intensity of the incident light

(C) increases with increase in the wavelength of the incident light

(D) is times the maximum kinetic energy of the emitted photoelectrons

When light exits a convex lens due to a light source placed at its focus, what is the shape of the wavefront of the light?

(A) both spherical and cylindrical

(B) plane

(C) spherical

(D) cylindrical

The mass number of nucleus having radius equal to half of the radius of nucleus with mass number 256 is:

(A) 32

(B) 64

(C) 80

(D) 48

The accurate form of Bernoulli's equation is (where symbols retain their standard definitions):

(A) constant

(B) constant

(C) constant

(D) constant

Section B: Integer Type Questions

Q21. A particle is doing simple harmonic motion of amplitude $A = 6$ m and time period $T = 4$ s. The maximum velocity of the particle is .

Q22. Two forces F_1 and F_2 are acting on a body. One force has magnitude thrice that of the other force, such that $F_2 = 3F_1$. The resultant of the two forces is equal to the force of larger magnitude F_2. The angle between F_1 and F_2 is θ. The value of θ is $_{degrees.}$

Q23. A capacitor of capacitance C_1 and potential V_1 has energy $U_1 = \frac{1}{2}C_1V_1^2$. It is connected to another capacitor of capacitance C_2 and potential V_2, which is initially uncharged. Then the loss of energy is $U_{loss} = \frac{1}{2}C_1V_1^2 - \frac{1}{2}(C_1 + C_2)V_{final}^2$, where $V_{final} = \frac{C_1V_1}{C_1+C_2}$.

Q24. An electric field $\vec{E}$ passes through a surface of area A with a unit vector $\hat{n}$. The electric flux Φ_E for that surface is given by the equation $\Phi_E = \vec{E} \cdot \hat{n} \cdot A$. If the magnitude of the electric field is $E = 12\,\mathrm{N/C}$ and the area is $A = 1\,\mathrm{m}^2$, what is the electric flux for that surface?

Q25. A force displaces a body from position A to position B. The work done by this force is calculated using the formula $W = F \cdot d \cdot \cos\theta$, where F is the magnitude of the force, d is the displacement, and θ is the angle between the force and the displacement direction. If the force applied is 10 N, the displacement is 6 m, and the angle θ is $0°$, the work done by this force is .

Q26. The displacement and the increase in the velocity of a moving particle in the time interval of t_0 to t_1 are s and $v_{increase}$, respectively. The distance travelled by the particle in the time interval t_0 to t_1 is .

Q27. A square loop of sides is held normally in front of a point charge . The flux of the electric field through the shaded region is , where the value of p is _____.

Q28. At room temperature, the resistance of a heating element is $R_0 = 10\,\Omega$. The temperature coefficient of the material is $\alpha = 0.004\,^{circ}\mathrm{C}^{-1}$. The temperature of the element, when its resistance is $R = 20\,\Omega$, is .

Q29. The electric field between the two parallel plates of a capacitor of capacitance C drops to one third of its initial value when the plates are connected by a thin wire. The resistance of this wire is calculated using the formula $R = \frac{V}{I}$, where V is the voltage across the capacitor and I is the current flowing through the wire. If the initial electric field is E_0 and the voltage is given by $V = E_0 d$, where d is the separation between the plates, the resistance of this wire is $_{(Given, the initial electric field}$ E_0 and the distance d are known.)

Q30. An alternating current at any instant is given by $I(t) = I_{max}\sin(\omega t + \phi)$, where $I_{max} = 10\,A$, $\omega = 2\pi$ rad/s, and $\phi = 0$. The value of the current is ____ A.

Chemistry

Section A: Multiple Choice Questions (MCQ)

Q31. The element that does not exhibit a variable oxidation state is:

(A) Bromine

(B) Iodine

(C) Chlorine

(D) Fluorine

Q32. How many radial nodes are present in the 3 p orbital?

(A) 1

(B) 4

(C) 2

(D) 3

Q33. Below are two assertions: Assertion I: S_8 solid undergoes a disproportionation reaction in alkaline conditions, resulting in the formation of S^{2-} and $S_2O_3^{2-}$. Assertion II: ClO_4^- can participate in a disproportionation reaction in acidic conditions. Based on the aforementioned assertions, select the most suitable response from the options listed below:

(A) Statement I is correct but statement II is incorrect.

(B) Statement I is incorrect but statement II is correct

(C) Both statement I and statement II are incorrect

(D) Both statement I and statement II are correct

Q34. Below are two statements: Statement I: The metallic radius of an element is r_{metal} and the ionic radius of the same element is lesser than r_{metal}. Statement II: Ions are consistently smaller in size compared to their corresponding elements. Based on the above statements, select the correct answer from the options provided below:

(A) Both Statement I and Statement II are false

(B) Statement I is incorrect but Statement II is true

(C) Both Statement I and Statement II are true

(D) Statement I is correct but Statement II is false

Q35. What is the molarity of a solution of NaCl dissolved in water? (Given: Molar Mass and)

(A) 2

(B) 20

(C) 4

(D) 0.2

Q36. Associate List - I with List - II. Select the appropriate answer from the options provided below:

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

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

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

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

Q37. The substances A and B produced in the subsequent reactions are: $CrO_2Cl_2+4NaOH \rightarrow A + 2NaCl + 2H_2O$ $A + 2HCl + 2H_2O_2 \rightarrow B + 3H_2O$

A = Na_{2}CrO_{4}, B = CrO_{5} A = Na_{2}Cr_{2}O_{4}, B = CrO_{4} A = Na_{2}Cr_{2}O_{7}, B = CrO_{3} A = Na_{2}Cr_{2}O_{7}, B = CrO_{5}

Determine the quantity of complexes from the following that possess an even count of unpaired electrons is [Given atomic numbers :]

(A) 2

(B) 1

(C) 4

(D) 5

Which of the following statements is accurate? A. Glycerol is purified through vacuum distillation due to its decomposition at the standard boiling point. B. Aniline can be purified via steam distillation since it is miscible in water. C. Ethanol can be extracted from an ethanol-water mixture by azeotropic distillation because it forms an azeotrope. D. An organic compound is considered pure if the mixed melting point remains constant. Select the most suitable answer from the options provided below:

(A) A, B, C only

(B) A, C, D only

(C) A, B, D only

(D) B, C, D only

Determine the accurate conversions that occur during acidic hydrolysis from the following options: (A) starch produces galactose. (B) cane sugar yields equal amounts of glucose and fructose. (C) milk sugar results in glucose and galactose. (D) amylopectin 2025 (28 Jan Shift 2)

(A) (A), (B) and (C) only

(B) (B), (C) and (E) only

(C) (C), (D) and (E) only

(D) (B), (C) and (D) only

What are the four quantum numbers for the electron located in the outermost orbital of potassium (atomic number 19)?

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

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

(C) n = 3, l = 0, m = -1, s = + $\frac{1}{2}$

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

Which of the following acids is classified as a vitamin?

(A) Adipic acid

(B) Ascorbic acid

(C) Saccharic acid

(D) Aspartic acid

Below are two statements: one is designated as Assertion A and the other as Reason R. Assertion A: H_2Te is more acidic than H_2S. Reason R: The bond dissociation enthalpy of H_2Te is lower than that of H_2S. Considering the statements above, select the most suitable option from those provided below.

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

(B) Both A and R are true and R is the correct explanation of A.

(C) A is false but R is true.

(D) A is true but R is false.

When Lead Sulphide reacts with dilute nitric acid, which of the following products is not generated?

(A) Nitric oxide

(B) Nitrous oxide

(C) Lead nitrate

(D) Sulphur

Below are two assertions regarding the X-ray spectra of elements: Assertion (I): A graph of (frequency of X-rays emitted) versus atomic mass forms a straight line. Assertion (II): A graph of (frequency of X-rays emitted) versus atomic number also forms a straight line. Based on these assertions, select the accurate answer from the options provided below:

(A) Both Statement I and Statement II are true

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

(C) Both Statement I and Statement II are false

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

The substances A and B produced in the reactions below are: $CrO_2Cl_2 + 4NaOH \rightarrow A + 2NaCl + 2H_2O$ $A + 2HCl + 2H_2O_2 \rightarrow B + 3H_2O$

A = Na_{2}CrO_{4}, B = CrO_{5} A = Na_{2}Cr_{2}O_{4}, B = CrO_{4} A = Na_{2}Cr_{2}O_{7}, B = CrO_{3} A = Na_{2}Cr_{2}O_{7}, B = CrO_{5}

The widely recognized name for Benzene - 1, 2 - diol is -

(A) catechol

(B) o-cresol

(C) quinol

(D) resorcinol

A connection between two nucleotides is referred to as:

(A) Phosphodiester linkage

(B) Glycosidic linkage

(C) Disulphide linkage

(D) Peptide linkage

Which functional group exhibits a negative resonance effect?

(A) -NH_{2}

(B) -OH

(C) -COOH

(D) -OR

During the process of creating Mohr's salt crystals, dil is incorporated into a blend of ferrous sulphate and ammonium sulphate prior to dissolving this combination in water. The purpose of adding dil here is to:

(A) prevent the hydrolysis of ferrous sulphate

(B) prevent the hydrolysis of ammonium sulphate

(C) make the medium strongly acidic

(D) increase the rate of formation of crystals

Section B: Integer Type Questions

Q51. A compound 'X' absorbs 2 moles of hydrogen and 'Y' upon oxidation with oxygen gives the compound 'Z'. The total number of bonds present in the compound 'X' is_____

Q52. The number of tripeptides formed by three different amino acids using each amino acid once is _____.

Q53. Among the species Fe^{2+} and Fe^{3+}, the spin-only magnetic moment value of the species with least oxidising ability is $_{B}M(Nearestinteger).(GivenatomicmemberisIron)$

Q54. The number of oxygen atoms present in the chemical formula of fuming sulphuric acid, which is represented as H_{2}S{O}_{7}, is _____.

Q55. Quantitative analysis of an organic compound (X) shows the following % composition: C: 64.46%, H: 1.8%, and Cl: 33.74%. Calculate the empirical formula mass of the compound. Given that the molar mass of the compound is 1655 g/mol, what is the empirical formula mass of the compound?

Q56. The total number of species from the following list in which one unpaired electron is present, is $_{.Considerthefollowingspecies:A)}$ O_2 B) N_2 C) Cl D) H_2 E) F_2

Q57. The number of ions from the following that have the ability to liberate hydrogen from a dilute acid is _____.

Q58. Number of carbocations from the following structures that are not stabilized by hyperconjugation is _____. Consider the structures: (1) a primary carbocation, (2) a secondary carbocation, (3) a tertiary carbocation, (4) a vinyl carbocation, (5) a benzyl carbocation.

Mathematics

Section A: Multiple Choice Questions (MCQ)

Q59. If the domain of the function is , then is equal to :

(A) 32

(B) 40

(C) 24

(D) 36

Q60. If $x + 2 = 4$, then what is x equal to?

(A) 4

(B) 1

(C) 3

(D) 2

Q61. If the function $f(x)$ is continuous at $x = 4$, then the value of $f(4)$ is equal to

(A) 968

(B) 1152

(C) 746

(D) 1250

Q62. Examine the two statements below: Statement I: For any two non-zero complex numbers, Statement II: If there are three distinct complex numbers and three positive real numbers such that, then between the two statements mentioned above,

(A) Statement I is correct but Statement II is incorrect.

(B) both Statement I and Statement II are correct.

(C) both Statement I and Statement II are incorrect.

(D) Statement I is incorrect but Statement II is correct.

Q63. If the set has elements $A = \{2, 4, 6, 8, 10\}$ and $B = \{1, 2, 3, 4, 5\}$, where the union of sets A and B is denoted as $A \cup B$, then the value of $|A \cup B|$ is

(A) 12

(B) 4

(C) 8

(D) 5

Q64. Let be the image of the point in the line . Then is equal to :

(A) 18

(B) 22

(C) 16

(D) 20

Q65. Let P be the set of seven digit numbers with sum of their digits equal to 12. If the numbers in P are formed by using the digits 1, 2 and 3 only, then the number of elements in the set is:

(A) 194

(B) 185

(C) 178

(D) 180

Q66. If the line segment joining the points $(2, 3)$ and $(4, 7)$ subtends an angle θ at the origin, then the absolute value of the product of all possible values of $\tan\theta$ is:

(A) 6

(B) 8

(C) 2

(D) -4

Q67. If the variance of the frequency distribution is 256, then the value of is 16.

(A) 16

(B) 15

(C) 14

(D) 13

Q68. Consider a point in the -plane that is equidistant from three points and ( ). Let and . Then, evaluate the statements (S1): is an isosceles right-angled triangle, and (S2): the area of is ,

(A) both are true

(B) only (S2) is true

(C) only (S1) is true

(D) both are false

Q69. Consider the following two assertions: Assertion I: Let $\vec{a}$ and $\vec{b}$ be vectors. Then the vector that satisfies $\vec{a} + \vec{b} = \vec{c}$ and has a magnitude of $|\vec{c}|$ is of magnitude $|\vec{c}|$. Assertion II: In a triangle, the sum of the angles is $180°$.

(A) Statement I is incorrect but Statement II is correct.

(B) Both Statement I and Statement II are correct.

(C) Statement I is correct but Statement II is incorrect.

(D) Both Statement I and Statement II are incorrect.

Q70. If $fx = x\ 3\ 2x\ 2 + 1\ 1 + 3x\ 3x\ 2 + 2\ 2x\ x\ 3 + 6\ x\ 3\ \text{-}x\ 4\ x\ 2\ \text{-}2$ for all x , then $2f0 + f\ '\ 0$ is equal to

(A) 48

(B) 24

(C) 42

(D) 18

Q71. Consider a certain function where . Then the value of is determined to be

(A) 1

(B) 3

(C) 6

(D) 2

Q72. Given that a and b are defined, what is the value of c?

(A) 3

(B) 0

(C) 1

(D) 2

Q73. If the minimum distance between the lines $x - \lambda - 2 = y - 2 = z - 1$ and $x - \sqrt{3} = y - 1 - 2 = z - 2$ is equal to 1, what is the total of all potential values of λ?

(A) 0

(B) $2\sqrt{3}$

(C) $3\sqrt{3}$

(D) -$2\sqrt{3}$

Q74. Let $fx = 2x\ 2 + 5x - 3$, xR . If m and n denote the number of points where f is not continuous and not differentiable respectively, then $m + n$ is equal to:

(A) 5

(B) 2

(C) 0

(D) 3

Q75. Let the circles and touch each other externally at the point. If the point divides the line segment joining the centres of the circles and internally in the ratio 3 : 5, then x equals

(A) 150

(B) 160

(C) 140

(D) 180

Q76. For $x = 4$, the least value of d, for which d, $d+4$, $d+8$ are three consecutive terms of an A.P., is equal to:

(A) 6

(B) 2

(C) 12

(D) 14

Q77. The 20 th term from the end of the progression 30, 29 $\frac{1}{4}$, 28 $\frac{1}{2}$, 27 $\frac{3}{4}$, . . . , -139 $\frac{1}{4}$ is :-

(A) -128

(B) -120

(C) -125

(D) -110

Section B: Integer Type Questions

Q78. Let A be a matrix such that for all nonzero matrices B. If A + B = C, and C is a scalar multiple of A, then the value of the determinant of A is _____.

Q79. Consider a line passing through the points $(2, 3)$ and $(4, 7)$. If the mirror image of the point $(6, 5)$ in the line is (x, y), then x is equal to

Q80. If r_1 and r_2 are the roots of the quadratic equation $x^2 - 8x + 15 = 0$, then $r_1 + r_2$ is equal to

Q81. Let $\vec{A}$ and $\vec{B}$ be vectors such that $\vec{A} = 5\hat{i} + 3\hat{j}$. If $\vec{B} = 4\hat{i} - 2\hat{j}$, then $\vec{A} \cdot \vec{B}$ is equal to

Q82. If $x = 4$, then x^3 is equal to

Q83. Let the observations be x_1, x_2, x_3, x_4, x_5. Let the mean be 18, the mean deviation about the mean be 4, and the variance of the 5 observations be s^2. Then the value of s^2 is equal to

Q84. How many different combinations can result in a total of 16 when rolling a die four times?

Q85. An arithmetic progression is written in the following way: If the first term is a and the common difference is d, the sum of the first n terms of the progression is given by the formula $S_n = \frac{n}{2}(2a + (n-1)d)$. If the sum of all the terms of the row is 1505, what is the value of n if $a = 5$ and $d = 10$?

Q86. Let the set $S = \{1, 2, 3, \ldots, 10\}$. Then the sum of all elements in the set is equal to

Q87. If the range of the common ratio r is $0 < r < 1$, then the sum of the infinite G.P., whose first term is 64 and the common ratio is r, is equal to

Answer Key

Physics

Section A (MCQ):

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
(2)	(1)	(1)	(1)	(4)	(2)	(4)	(2)	(1)	(3)
Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
(1)	(1)	(3)	(4)	(1)	(1)	(4)	(2)	(1)	(1)

Section B (Integer):

Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
12	60	2	12	58	175	48	1027	4	8

Chemistry

Section A (MCQ):

Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40
(4)	(1)	(1)	(4)	(1)	(4)	(1)	(1)	(2)	(2)
Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50
(2)	(2)	(2)	(2)	(3)	(1)	(1)	(1)	(3)	(1)

Section B (Integer):

Q51	Q52	Q53	Q54	Q55	Q56	Q57	Q58
27	6	0	7	1655	4	2	5

Mathematics

Section A (MCQ):

Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69	Q70
(1)	(2)	(2)	(1)	(1)	(1)	(1)	(4)	(1)	(3)
Q71	Q72	Q73	Q74	Q75	Q76	Q77	Q78	Q79	
(1)	(3)	(1)	(2)	(2)	(4)	(1)	(1)	(3)	

Section B (Integer):

Q80	Q81	Q82	Q83	Q84	Q85	Q86	Q87	Q88	Q89
44	6	6	30	64	33	125	100	46	96