JEE Main Practice Paper

Based on JEE Main Pattern

Generated: December 01, 2025 | Difficulty: Medium

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. A cricket player catches a ball of mass 120 g moving with 25 m s^-1 speed. If the catching process is completed in 0.1 s then the magnitude of force exerted by the ball on the hand of player will be(in SI unit):

(A) 24

(B) 12

(C) 25

(D) 30

Q2. By what percentage will the illumination of the lamp decrease if the current drops by 20% ?

(A) 46%

(B) 26%

(C) 36%

(D) 56%

Q3. The amount of work done to break a big water drop of radius ' ' into 27 small drops of equal radius is 10 J . The work done required to break the same big drop into 64 small drops of equal radius will be

(A) 15 J

(B) 5 J

(C) 20 J

(D) 10 J

Q4. In a plane EM wave, the electric field oscillates sinusoidally at a frequency of 5 x 10^10 Hz and an amplitude of 50 V m – 1 . The total average energy density of the electromagnetic field of the wave is : [Use 0 = 8.85 × 10 – 12 C 2 N^-1 m^-2]

(A) 1.106 × 10 – 8 J m – 3

(B) $4.425 \times 10 - 8$ J m – 3

(C) $2.212 \times 10 - 8$ J m – 3

(D) $2.212 \times 10 - 10$ J m – 3

Q5. The pressure and volume of an ideal gas are related as 3 2 = (Constant). The work done when the gas is taken from state 1 , 1 , T 1 to state 2 , 2 , T 2 is :

(A) 2 (1 1 - 2 2)

(B) 2 (2 2 - 1 1)

(C) 2 1 1 - 2 2

(D) 2 2 2 - 1 1

Q6. Given below are two statements. One is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A) : Knowing initial position and initial momentum is enough to determine the position and momentum at any time for a simple harmonic motion with a given angular frequency . Reason (R): The amplitude and phase can be expressed in terms of and . In the light of the above statements, choose the correct answer from the options given below :

(A) (A) is false but (R) is true

(B) (A) is true but (R) is false

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

(D) Both and are true and is the correct explanation of

Q7. When a polaroid sheet is rotated between two crossed polaroids then the transmitted light intensity will be maximum for a rotation of :

(A) 60°

(B) 30°

(C) 90°

(D) 45°

Q8. Two point charges and , constituting an electric dipole, are placed at and in a uniform electric field of strength . The work done on the dipole in rotating it from the equilibrium through is :

(A) 18.4 mJ

(B) 14.4 mJ

(C) 12.4 mJ

(D) 16.4 mJ

Q9. With rise in temperature, the Young's modulus of elasticity

(A) changes erratically

(B) decreases

(C) increases

(D) remains unchanged

Q10. Four identical particles of mass are kept at the four corners of a square. If the gravitational force exerted on one of the masses by the other masses is 22 + 1 32 2 L 2 , the length of the sides of the square is

(A) L 2

(B) 4 L

(C) 3 L

(D) 2 L

Q11. A big drop is formed by coalescing 1000 small droplets of water. The surface energy will become :

(A) 100 times

(B) 10 times

(C) 1 100 th

(D) 1 10 th

Q12. The de Broglie wavelengths of a proton and an particle are and 2 respectively. The ratio of the velocities of proton and particle will be :

(A) 1 : 8

(B) 1 : 2

(C) 4 : 1

(D) 8 : 1

Q13. Projectiles and are thrown at angles of 45° and 60° with vertical respectively from top of a 400 m high tower. If their times of flight are same, the ratio of their speeds of projection : is:

(A) 1: 3

(B) 2: 1

(C) 1: 2

(D) 1: 2

Q14. A force is represented by = 2 + t 1/2 , where = distance and t= time. The dimensions of 2 are :

(A) [ML 3 T – 3]

(B) [MLT – 2]

(C) [ML – 1 T – 1]

(D) [ML 2 T – 3]

Q15. A bullet is fired into a fixed target looses one third of its velocity after travelling 4 cm . It penetrates further × 10^-3 m before coming to rest. The value of is :

(A) 32

(B) 5

(C) 3

(D) 4

Q16. If the percentage errors in measuring the length and the diameter of a wire are 0.1% each. The percentage error in measuring its resistance will be:

(A) 0.2%

(B) 0.3%

(C) 0.1%

(D) 0.144%

Q17. If 50 Vernier divisions are equal to 49 main scale divisions of a travelling microscope and one smallest reading of main scale is 0.5 mm the Vernier constant of travelling microscope is:

(A) 0.1 mm

(B) 0.1 cm

(C) 0.01 cm

(D) 0.01 mm

Q18. A transparent film of refractive index, 2.0 is coated on a glass slab of refractive index, 1.45. What is the minimum thickness of transparent film to be coated for the maximum transmission of Green light of wavelength 550 nm . [Assume that the light is incident nearly perpendicular to the glass surface.]

(A) 137.5 nm

(B) 275 nm

(C) 94.8 nm

(D) 68.7 nm

Q19. A proton moving with a constant velocity passes through a region of space without any change in its velocity. If and represent the electric and magnetic fields respectively, then the region of space may have : (A) ; (B) ; (C) ; (D) Choose the most appropriate answer from the options given below :

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

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

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

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

Q20. An object is placed in a medium of refractive index 3 . An electromagnetic wave of intensity 6 x 10^8 W m^-2 falls normally on the object and it is absorbed completely. The radiation pressure on the object would be (speed of light in free space = 3 x 10^8 m s^-1):

(A) 36 N m^-2

(B) 18 N m^-2

(C) 6 N m^-2

(D) 2 N m^-2

Section B: Integer Type Questions

Q21. In Franck-Hertz experiment, the first dip in the current-voltage graph for hydrogen is observed at 10.2 V. The wavelength of light emitted by hydrogen atom when excited to the first excitation level is _____ . (Given).

Q22. The coercivity of a magnet is . The amount of current required to be passed in a solenoid of length and the number of turns 150 , so that the magnet gets demagnetised when inside the solenoid is _____A.

Q23. A body falling under gravity covers two points A and B separated by 80 m in 2 s . The distance of upper point A from the starting point is _____ m . Use g = 10 m s^-2

Q24. When a coil is connected across a dc supply, it draws a current of . When it is connected across ac supply, it draws a current of . The self inductance of the coil is _____ . Take)

Q25. An infinite plane sheet of charge having uniform surface charge density is placed on plane. Another infinitely long line charge having uniform linear charge density is placed at plane and parallel to -axis. If the magnitude values then at point , the ratio of magnitudes of electric field values due to sheet charge to that of line charge is . The value of is_____.

Q26. A time varying potential difference is applied between the plates of a parallel plate capacitor of capacitance . The dielectric constant of the medium between the capacitor plates is 1 . It produces an instantaneous displacement current of 0.25 mA in the intervening space between the capacitor plates, the magnitude of the rate of change of the potential difference will be _____ .

Q27. A particle is doing simple harmonic motion of amplitude and time period . The maximum velocity of the particle is _____ .

Q28. Suppose a uniformly charged wall provides a uniform electric field of 2 x 10^4 N C^-1 normally. A charged particle of mass 2 g being suspended through a silk thread of length 20 cm and remain stayed at a distance of 10 cm from the wall. Then the charge on the particle will be 1 x C where = _____ [use g= 10 m s^-2]

Q29. The identical spheres each of mass 2 M are placed at the corners of a right angled triangle with mutually perpendicular sides equal to 4 m each. Taking point of intersection of these two sides as origin, the magnitude of position vector of the centre of mass of the system is 42 , where the value of is _____.

Q30. The disintegration energy for the nuclear fission of is _____ . Given atomic masses of , Value of

Chemistry

Section A: Multiple Choice Questions (MCQ)

Q31. The metal atom present in the complex MABXL (where A, B, X and L are unidentate ligands and is metal) involves hybridization. The number of geometrical isomers exhibited by the complex is:

(A) 2

(B) 0

(C) 4

(D) 3

Q32. Match List-I with List-II :

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

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

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

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

Q33. Given below are two statements : Statement I : The electronegativity of group elements from to gradually decreases. Statement II : Group contains non-metallic, metallic, as well as metalloid elements. In the light of the above statements, choose the most appropriate from the options given below :

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

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

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

Q34. The compounds which give positive Fehling's test are : (A) (B) (C) (D) (E) Choose the correct answer from the options given below :

(A) (A), (D) and (E) Only

(B) (C), (D) and (E) Only

(C) (A), (C) and (D) Only

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

Q35. On reaction of Lead Sulphide with dilute nitric acid which of the following is not formed?

(A) Nitric oxide

(B) Nitrous oxide

(C) Lead nitrate

(D) Sulphur

Q36. For a given reaction is related to as given in table. Given: Which of the following is true? A. The order of the reaction is . B. If is 1 M , then is C. The order of the reaction changes to 1 if the concentration of reactant changes from 0.100 M to 0.500 M . D. is 800 min for Choose the correct answer from the options given below: Options

(A) A and C Only

(B) A, B and D Only

(C) C and D Only

(D) A and B Only

Q37. Match List-I with List-II : Choose the correct answer from the options given below :

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

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

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

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

Q38. Which of the following oxidation reactions are carried out by both and in acidic medium? A. B. C. D. E. Choose the correct answer from the options given below:

(A) C, D and E Only

(B) B, C and D Only

(C) A, D and E Only

(D) A, B and C Only

Q39. Number of complexes from the following with even number of unpaired " " electrons is [Given atomic numbers :]

(A) 2

(B) 1

(C) 4

(D) 5

Q40. An amount of ice of mass and temperature is transformed to vapour of temperature by applying heat. The total amount of work required for this conversion is, (Take, specific heat of ice , specific heat of water , specific heat of steam , Latent heat of ice and Latent heat of steam)

(A) 3043 J

(B) 3024 J

(C) 3003 J

(D) 3022 J

Q41. Combustion of glucose produces and water. The amount of oxygen (in g) required for the complete combustion of of glucose is : [Molar mass of glucose in]

(A) 480

(B) 800

(C) 960

(D) 32

Q42. The purification method based on the following physical transformation is :

(A) Distillation

(B) Extraction

(C) Sublimation

(D) Crystallization

Q43. A vessel at 1000 K contains with a pressure of 0.5 atm . Some of is converted into CO on addition of graphite. If total pressure at equilibrium is 0.8 atm , then Kp is :

(A) 1.8 atm

(B) 0.3 atm

(C) 3 atm

(D) 0.18 atm

Q44. Match List I with List II Choose the correct answer from the options given below :-

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

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

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

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

Q45. The number of ions from the following that are expected to behave as oxidising agent is :

(A) 3

(B) 2

(C) 1

(D) 4

Q46. The atomic mass of 6 C 12 is 12.000000 u and that of 6 C 13 is 13.003354 u . The required energy to remove a neutron from 6 C 13 , if mass of neutron is 1.008665 u , will be:

(A) 62.5MeV

(B) 6.25MeV

(C) 4.95MeV

(D) 49.5MeV

Q47. Common name of Benzene - 1, 2 - diol is -

(A) catechol

(B) o-cresol

(C) quinol

(D) resorcinol

Q48. IUPAC name of following compound is

(A) 2 – Aminopentanenitrile

(B) 2 – Aminobutanenitrile

(C) 3 – Aminobutanenitrile

(D) 3 – Aminopropanenitrile

Q49. Match List I with List II Choose the correct answer from the options given below:

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

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

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

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

Q50. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R. Assertion A : H 2 Te is more acidic than H 2 S . Reason R: Bond dissociation enthalpy of H 2 Te is lower than H 2 S . In the light of the above statements. Choose the most appropriate from the options given 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.

Section B: Integer Type Questions

Q51. An ideal gas, , is expanded adiabatically against a constant pressure of 1 atm untill it doubles in volume. If the initial temperature and pressure is and , respectively then the final temperature is _____ (nearest integer). [is the molar heat capacity at constant volume]

Q52. The 'spin only' magnetic moment value of is _____ BM. (Where M is a metal having least metallic radii. among and). (Given atomic number: and)

Q53. was taken in a 1 L reaction vessel and allowed to undergo the following reaction at 500 K The total pressure at equilibrium was found to be 18.65 bar. Then, _____ [nearest integer] Assume to behave ideally under these conditions. Given: bar

Q54. The amount of electricity in Coulomb required for the oxidation of 1 mol of H 2 O to O 2 is _____ $\times$ 10 5 C .

Q55. An octahedral complex with the formula upon reaction with excess of solution gives 2 moles of . Consider the oxidation state of in the complex is ' '. The value of " " is _____

Q56. If is ionised in an aqueous solution, then the value of van't Hoff factor (i) is _____ . 2025 (29 Jan Shift 1)

Q57. In the reaction of potassium dichromate, potassium chloride and sulfuric acid (conc.), the oxidation state of the chromium in the product is + _____.

Q58. The total number of carbon atoms present in tyrosine, an amino acid, is _____

Q59. The vapour pressure of pure benzene and methyl benzene at is given as 80 Torr and 24 Torr, respectively. The mole fraction of methyl benzene in vapour phase, in equilibrium with an equimolar mixture of those two liquids (ideal solution) at the same temperature is _____ (nearest integer)

Q60. A compound ' absorbs 2 moles of hydrogen and ' upon oxidation with gives The total number of bonds present in the compound ' is_____

Mathematics

Section A: Multiple Choice Questions (MCQ)

Q61. Let the point, on the line passing through the points and , farther from the origin and at distance of 9 units from the point , be . Then is equal to :

(A) 165

(B) 160

(C) 155

(D) 150

Q62. Let = 2 2 + 5- 3, R . If and denote the number of points where is not continuous and not differentiable respectively, then + is equal to:

(A) 5

(B) 2

(C) 0

(D) 3

Q63. Let and . Then is equal to :

(A) 1

(B) 6

(C) 4

(D) 2

Q64. The sum of all rational terms in the expansion of is equal to :

(A) 3133

(B) 931

(C) 6131

(D) 633

Q65. Consider the line passing through the points and . The distance of the point from the line along the line is equal to

(A) 6

(B) 5

(C) 4

(D) 3

Q66. Let be defined as : Then the function is

(A) neither one-one nor onto.

(B) one-one but not onto.

(C) onto but not one-one.

(D) both one-one and onto.

Q67. A coin is biased so that a head is twice as likely to occur as a tail. If the coin is tossed 3 times, then the probability of getting two tails and one head is-

(A) 2/9

(B) 1/9

(C) 2/27

(D) 1/27

Q68. If the value of is , where are natural numbers and , then is equal to :

(A) 40

(B) 52

(C) 50

(D) 54

Q69. The number of complex numbers , satisfying and , is :

(A) 4

(B) 8

(C) 10

(D) 6

Q70. Let : R→R and g: R→R be defined as = log , > 0 - , 0 and g= , 0 , < 0 . Then, g: R→R is:

(A) one-one but not onto

(B) neither one-one nor onto

(C) onto but not one-one

(D) both one-one and onto

Q71. Two marbles are drawn in succession from a box containing 10 red, 30 white, 20 blue and 15 orange marbles, with replacement being made after each drawing. Then the probability, that first drawn marble is red and second drawn marble is white, is

(A) 2/25

(B) 4/25

(C) 2/3

(D) 4/75

Q72. Consider the following two statements : Statement I : For any two non-zero complex numbers , Statement II : If are three distinct complex numbers and are three positive real numbers such that , then Between the above two statements,

(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.

Q73. Let : R→R be defined = 2 + + . If (0) = - 1, ' log 2 = 21 and 0 log4 - = 39/2 , then the value of |+ + | equals:

(A) 16

(B) 10

(C) 12

(D) 8

Q74. Let and be the points on the line + 3 8 = -4 2 = + 1 2 which are at a distance of 6 units from the point R(1, 2, 3) . If the centroid of the triangle R is , , , then 2 + 2 + 2 is:

(A) 26

(B) 36

(C) 18

(D) 24

Q75. Let , and be a function such that for all . Then is equal to :

(A) 14

(B) 42

(C) 7

(D) 1

Q76. Let , where and are integers and . Let the values of the ordered pair , for which the area of the parallelogram of diagonals and is , be and . Then is equal to

(A) 19

(B) 17

(C) 24

(D) 21

Q77. In an increasing geometric progression of positive terms, the sum of the second and sixth terms is and the product of the third and fifth terms is 49 . Then the sum of the and terms is equal to :

(A) 96

(B) 91

(C) 84

(D) 78

Q78. The number of solutions of the equation 4sin 2 -4cos 3 + 9 -4cos= 0; -2, 2 is:

(A) 1

(B) 3

(C) 2

(D) 0

Q79. Let g(x) = 3 f x 3 + f(3 - x) and f " (x) > 0 for all x (0, 3) . If g is decreasing in (0,) and increasing in (, 3) , then 8 is

(A) 24

(B) 0

(C) 18

(D) 20

Q80. The 20 th term from the end of the progression 20, 19 1/4 , 18 1/2 , 17 3/4 , . . . , - 129 1 4 is :-

(A) -118

(B) -110

(C) -115

(D) -100

Section B: Integer Type Questions

Q81. Let integers be such that . Then the number of all possible ordered pairs (a, b), for which and , where and are the roots of , is equal to _ _ _ _ _ _ _ _.

Q82. Let the set of all positive values of , for which the point of local minimum of the function satisfies , be . Then is equal to _ _ _ _ _ _ _ _ _

Q83. Let denote the fractional part of and = cos^-1 1 - 2 sin(-1) 1 - - 3 , 0 . If L and R respectively denotes the left hand limit and the right hand limit of at = 0 , then 32 2 L 2 + R 2 is equal to _ _ _ _ _ _ _ _ _ _ _.

Q84. Remainder when is divided by is equal to _ _ _ _ _.

Q85. If and are the roots of the quadratic equation , then is equal to_ _ _ _ _ _ _ _ _ _ _

Q86. Let the distance between two parallel lines be 5 units and a point lie between the lines at a unit distance from one of them. An equilateral triangle is formed such that lies on one of the parallel lines, while lies on the other. Then is equal to _____ -.

Q87. The total number of words (with or without meaning) that can be formed out of the letters of the word "DISTRIBUTION" taken four at a time, is equal to _____.

Q88. Let . If for some , then is equal to _____

Q89. Let and denote the outcome of three independent rolls of a fair tetrahedral die, whose four faces are marked . If the probability that has all real roots is , , then is equal to _____

Q90. Let the length of the focal chord PQ of the parabola be 15 units. If the distance of from the origin is , then is equal to _____

Answer Key

Physics

Section A (MCQ):

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

Section B (Integer):

Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
122	10	45	10	16	100	12	3	3	208

Chemistry

Section A (MCQ):

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

Section B (Integer):

Q51	Q52	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60
274	0	962	2	2	16	6	9	23	27

Mathematics

Section A (MCQ):

Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69	Q70
(3)	(4)	(4)	(1)	(4)	(1)	(1)	(2)	(2)	(2)
Q71	Q72	Q73	Q74	Q75	Q76	Q77	Q78	Q79	Q80
(4)	(1)	(4)	(3)	(1)	(1)	(2)	(4)	(3)	(3)

Section B (Integer):

Q81	Q82	Q83	Q84	Q85	Q86	Q87	Q88	Q89	Q90
10	39	18	1	6	28	3734	55	19	72