

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.** Force between two point charges q_1 and q_2 placed in vacuum at r cm apart is F . Force between them when placed in a medium having dielectric $\epsilon = 5$ at $5r$ cm apart will be:
- (A) $25F$
(B) $5F$
(C) F
(D) $25F$
- Q2.** A heavy iron bar of weight 12 kg is having its one end on the ground and the other on the shoulder of a man. The rod makes an angle 60° with the horizontal, the normal force applied by the man on bar is:
- (A) $6\text{ kg} - \text{wt}$
(B) $12\text{ kg} - \text{wt}$
(C) $3\text{ kg} - \text{wt}$
(D) $63\text{ kg} - \text{wt}$
- Q3.** If two vectors \vec{a} and \vec{b} having equal magnitude R are inclined at an angle 2θ , then
- (A) $\vec{a} - \vec{b} = 2R\sin \theta$
(B) $\vec{a} + \vec{b} = 2R\sin \theta$
(C) $\vec{a} + \vec{b} = 2R\cos \theta$
(D) $\vec{a} - \vec{b} = 2R\cos \theta$
- Q4.** The resistance per centimeter of a meter bridge wire is $2\text{ }\Omega$, with $10\text{ }\Omega$ resistance in left gap. Balancing length from left end is at 40 cm with $25\text{ }\Omega$ resistance in right gap. Now the wire is replaced by another wire of $2\text{ }\Omega$ resistance per centimeter. The new balancing length for same settings will be at
- (A) 20 cm
(B) 10 cm

(C) 80 cm

(D) 40 cm

Q5. Match List - I with List - II. List - I List - II (A) Magnetic induction (I) Ampere meter
(B) Magnetic intensity (II) Weber (C) Magnetic flux (III) Gauss (D) Magnetic moment
(IV) Ampere/meter

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

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

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

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

Q6. Train A is moving along two parallel rail tracks towards north with 72 km h^{-1} and train is moving towards south with speed 108 km h^{-1} . Velocity of train with respect to and velocity of ground with respect to are (in m s^{-1}):

(A) -30 and 50

(B) -50 and -30

(C) -50 and 30

(D) 50 and -30

Q7. The de Broglie wavelengths of a proton and an α particle are λ and 2λ respectively. The ratio of the velocities of proton and α particle will be :

(A) $1 : 8$

(B) $1 : 2$

(C) $4 : 1$

(D) $8 : 1$

Q8. In a nuclear fission reaction of an isotope of mass M , three similar daughter nuclei of same mass are formed. The speed of a daughter nuclei in terms of mass defect M will be :

(A) $2M$

(B) $M/2$

(C) $2M$

(D) $3M$

Q9. A beam of unpolarised light of intensity I_0 is passed through a polaroid and then through another polaroid which is oriented so that its principal plane makes an angle of 45° relative to that of the first. The intensity of emergent light is :

(A) $I_0/4$

(B) I_0

(C) $I_0/2$

(D) $I_0/8$

Q10. Given below are two statements : Statement I : In a vernier callipers, one vernier scale division is always smaller than one main scale division. Statement II : The vernier constant is given by one main scale division multiplied by the number of vernier scale divisions. In the light of the above statements, choose the correct answer from the options given below.

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

- (B) Statement I is false but Statement II is true
- (C) Both Statement I and Statement II are false
- (D) Both Statement I and Statement II are true 2025 (22 Jan Shift 1)

Q11. A particle of charge $-q$ and mass m moves in a circle of radius r around an infinitely long line charge of linear density $+\lambda$. Then time period will be given as: (Consider k as Coulomb's constant)

- (A) $T = 4\pi \sqrt{\frac{2}{k\lambda}}$
- (B) $T = 2\pi \sqrt{\frac{2}{k\lambda}}$
- (C) $T = 1\pi \sqrt{\frac{2}{k\lambda}}$
- (D) $T = 1\pi \sqrt{\frac{2}{k\lambda}}$

Q12. Which of the following circuits represents a forward biased diode? Choose the correct answer from the options given below :

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

Q13. In a plane EM wave, the electric field oscillates sinusoidally at a frequency of 5×10^{10} Hz and an amplitude of 50 V m^{-1} . The total average energy density of the electromagnetic field of the wave is : [Use $\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$]

- (A) $1.106 \times 10^{-8} \text{ J m}^{-3}$
- (B) $4.425 \times 10^{-8} \text{ J m}^{-3}$
- (C) $2.212 \times 10^{-8} \text{ J m}^{-3}$
- (D) $2.212 \times 10^{-10} \text{ J m}^{-3}$

Q14. A light string passing over a smooth light fixed pulley connects two blocks of masses m_1 and m_2 . If the acceleration of the system is $\frac{g}{8}$, then the ratio of masses is

- (A) $\frac{9}{7}$
- (B) $\frac{8}{1}$
- (C) $\frac{4}{3}$
- (D) $\frac{5}{3}$

Q15. In a co-axial straight cable, the central conductor and the outer conductor carry equal currents in opposite directions. The magnetic field is zero :

- (A) outside the cable
- (B) inside the outer conductor
- (C) inside the inner conductor
- (D) in between the two conductors

Q16. 10 divisions on the main scale of a Vernier calliper coincide with 11 divisions on the Vernier scale. If each division on the main scale is of 5 units, the least count of the instrument is :

- (A) $\frac{1}{2}$

- (B) 10/11
- (C) 50/11
- (D) 5/11

Q17. If G be the gravitational constant and ρ be the energy density then which of the following quantity have the dimensions as that of the :

- (A) pressure gradient per unit mass
- (B) Gravitational potential
- (C) Energy per unit mass
- (D) Force per unit mass

Q18. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A) : Time period of a simple pendulum is longer at the top of a mountain than that at the base of the mountain. Reason (R): Time period of a simple pendulum decreases with increasing value of acceleration due to gravity and vice-versa. In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) Both are true and (R) is the correct explanation of (A)
- (B) (A) is true but (R) is false
- (C) (A) is false but (R) is true
- (D) Both are true but (R) is not the correct explanation of (A)

Q19. A thin plano convex lens made of glass of refractive index 1.5 is immersed in a liquid of refractive index 1.2. When the plane side of the lens is silver coated for complete reflection, the lens immersed in the liquid 2025 (24 Jan Shift 1)

- (A) 0.20 m
- (B) 0.25 m
- (C) 0.15 m
- (D) 0.10 m

Q20. To obtain the given truth table, following logic gate should be placed at G: 2025 (22 Jan Shift 2)

- (A) OR Gate
- (B) AND Gate
- (C) NOR Gate
- (D) NAND Gate

Section B: Integer Type Questions

Q21. A closed and an open organ pipe have same lengths. If the ratio of frequencies of their seventh overtones is then the value of is _____ *Answer:* _____

Q22. A vernier callipers has 20 divisions on the vernier scale, which coincides with division on the main scale. The least count of the instrument is . One main scale division is equal to _____ . *Answer:* _____

- Q23.** An electron with kinetic energy enters a region of uniform magnetic field of 3 perpendicular to its direction. An electric field is applied perpendicular to the direction of velocity and magnetic field. The value of E , so that electron moves along the same path, is _____. Given, mass of electron m , electric charge e . *Answer:* _____
- Q24.** Two planets, P_1 and P_2 are orbiting a common star in circular orbits of radii r_1 and r_2 , respectively, with angular velocities ω_1 and ω_2 . The planet P_1 is times more massive than planet P_2 . The ratio of angular momentum of planet P_1 to that of planet P_2 is closest to integer _____. *Answer:* _____
- Q25.** The fractional compression of water at the depth of 2.5 km below the sea level is _____. Given, the Bulk modulus of water K , density of water ρ , acceleration due to gravity g . *Answer:* _____
- Q26.** A ring and a solid sphere roll down the same inclined plane without slipping. They start from rest. The radii of both bodies are identical and the ratio of their kinetic energies is $7x$, where x is _____. *Answer:* _____
- Q27.** Three balls of masses m_1, m_2 and m_3 respectively are arranged at centre of the edges of an equilateral triangle of side a . The moment of inertia of the system about an axis through the centroid and perpendicular to the plane of triangle, will be _____. *Answer:* _____
- Q28.** Light from a point source in air falls on a convex curved surface of radius 20 cm and refractive index 1.5. If the source is located at 100 cm from the convex surface, the image will be formed at _____ cm from the object. *Answer:* _____
- Q29.** A alternating current at any instant is given by $i = I \sin \omega t$. The value of the current is _____ A. *Answer:* _____
- Q30.** If the radius of earth is reduced to three-fourth of its present value without change in its mass then value of duration of the day of earth will be _____ hours 30 minutes. *Answer:* _____

Chemistry

Section A: Multiple Choice Questions (MCQ)

- Q31.** Combustion of glucose produces CO_2 and water. The amount of oxygen (in g) required for the complete combustion of 180 g of glucose is : [Molar mass of glucose in g/mol is 180]
- (A) 480
(B) 800
(C) 960
(D) 32
- Q32.** Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A) : Both rhombic and monoclinic sulphur exist as while oxygen exists as O_2 . Reason (R) : Oxygen forms multiple bonds with itself and other elements having small size and high electronegativity like N , which is not possible for sulphur. In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) (A) is correct but (R) is not correct
- (B) (A) is not correct but (R) is correct
- (C) Both (A) and (R) are correct and (R) is the correct explanation of (A)
- (D) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

Q33. 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)-(I), (B)-(II), (C)-(IV), (D)-(III)
- (C) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
- (D) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)

Q34. Given below are two statements : Statement (I): In partition chromatography, stationary phase is thin film of liquid present in the inert support. Statement (II) : In paper chromatography, the material of paper acts as a stationary phase. In the light of the above statements, choose the correct answer from the options given below :

- (A) Statement I is true but Statement II is false
- (B) Statement I is false but Statement II is true
- (C) Both Statement I and Statement II are false
- (D) Both Statement I and Statement II are true

Q35. 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

Q36. Identify from the following species in which $d^2 sp^3$ hybridization is shown by central atom:

- (A) $\text{Co(NH}_3)_6^{3+}$
- (B) BrF_5
- (C) $\text{Pt}(\text{Cl})_4^{2-}$
- (D) SF_6

Q37. Given below are two statements: Statement-I: Since fluorine is more electronegative than nitrogen, the net dipole moment of NF_3 is greater than NH_3 . Statement-II: In NH_3 , the orbital dipole due to lone pair and the dipole moment of NH bonds are in opposite direction, but in NF_3 the orbital dipole due to lone pair and dipole moments of N-F bonds are in same direction. In the light of the above statements. Choose the most appropriate from the options given below.

- (A) Statement I is true but Statement II is false.
- (B) Both Statement I and Statement II are false.
- (C) Both statement I and Statement II is are true.

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

Q38. IUPAC name of following hydrocarbon is :

- (A) 2-Ethyl-3,6-dimethylheptane
- (B) 2,5,6-Trimethyloctane
- (C) 3,4,7-Trimethyloctane
- (D) 2-Ethyl-2,6-diethylheptane

Q39. Which of the following is not correct?

- (A) is negative for a spontaneous reaction
- (B) is positive for a spontaneous reaction
- (C) is zero for a reversible reaction
- (D) is positive for a non-spontaneous reaction

Q40. Integrated rate law equation for a first order gas phase reaction is given by (where p_0 is initial pressure and p_t is total pressure at time t)

- (A) $\ln \frac{p_0}{p_t} = 2.303 kt$
- (B) $\ln \frac{2p_0 - p_t}{p_0} = 2.303 kt$
- (C) $\ln \frac{2p_0 - p_t}{p_0} = 2.303 kt$
- (D) $\ln \frac{2p_0 - p_t}{p_0} = 2.303 kt$

Q41. The purification method based on the following physical transformation is :

- (A) Distillation
- (B) Extraction
- (C) Sublimation
- (D) Crystallization

Q42. Match List I with List II LIST – I (Complex ion) LIST – II (Electronic Configuration)
 A. $[\text{Co}(\text{NH}_3)_6]^{3+}$ + I. $t_2 g_2$ B. $[\text{Co}(\text{NH}_3)_6]^{3+}$ + II. $t_2 g_3$ C. $[\text{Co}(\text{NH}_3)_6]^{2+}$ + III. $t_2 g_3$ D. $[\text{Co}(\text{NH}_3)_6]^{3+}$ + IV. $t_2 g_6$ Choose the correct answer from the options given below :

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

Q43. Consider 'x' is the number of lone pair of electrons present in the equatorial position of the most stable structure of XeF_4 . The ions from the following with 'x' number of unpaired electrons are A. B. C. D. E. Choose the correct answer from the options given below:

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

- Q44.** Given below are two statements : Statement (I) : Nitrogen, sulphur, halogen and phosphorus present in an organic compound are detected by Lassaigne's Test. Statement (II) : The elements present in the compound are converted from covalent form into ionic form by fusing the compound with Magnesium in Lassaigne's test. In the light of the above statements, choose the correct answer from the options given below :
- (A) Statement I is false but Statement II is true
 - (B) Both Statement I and Statement II are true
 - (C) Both Statement I and Statement II are false
 - (D) Statement I is true but Statement II is false
- Q45.** Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A): reaction of occurs more readily than the reaction of . Reason (R) : The partially bonded unhybridized p-orbital that develops in the trigonal bipyramidal transition state is stabilized by conjugation with the phenyl ring. In the light of the above statements, choose the most appropriate answer from the options given below :
- (A) (A) is correct but (R) is not correct
 - (B) (A) is not correct but (R) is correct
 - (C) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
 - (D) Both (A) and (R) are correct and (R) is the correct explanation of
- Q46.** Given below are two statements : Statement (I) : The radii of isoelectronic species increases in the order. Statement (II): The magnitude of electron gain enthalpy of halogen decreases in the order. In the light of the above statements, choose the most appropriate answer from the options given below :
- (A) Statement I is incorrect but Statement II is correct
 - (B) Statement I is correct but Statement II is incorrect
 - (C) Both Statement I and Statement II are incorrect
 - (D) Both Statement I and Statement II are correct 2025 (29 Jan Shift 1)
- Q47.** Number of Complexes with even number of electrons in orbitals is -
- (A) 2
 - (B) 3
 - (C) 1
 - (D) 5
- Q48.** Correct order of basic strength of Pyrrole , Pyridine , and Piperidine is:
- (A) Pyrrole Piperidine Pyridine
 - (B) Pyrrole Pyridine Piperidine
 - (C) Pyridine Piperidine Pyrrole
 - (D) Piperidine Pyridine Pyrrole
- Q49.** Match List - I with List - II. Choose the correct answer from the options given 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)

Q50. Given below are the atomic numbers of some group 14 elements. The atomic number of the element with lowest melting point is :

- (A) 6
- (B) 82
- (C) 14
- (D) 50

Section B: Integer Type Questions

Q51. Number of compounds from the following with zero dipole moment is _____ *Answer:* _____

Q52. The mass of silver (Molar mass of) displaced by a quantity of electricity which displaces of at S.T.P. will be _____ g. *Answer:* _____

Q53. The heat of solution of anhydrous and are and respectively. The heat of hydration of to is . The value of is _____ (nearest integer). *Answer:* _____

Q54. The maximum number of orbitals which can be identified with and is _____ *Answer:* _____

Q55. Quantitative analysis of an organic compound (X) shows following
Answer: _____

Q56. Number of colourless lanthanoid ions among the following is _____ *Answer:* _____

Q57. The mass defect in a particular reaction is 0.4 g . The amount of energy liberated is $\times 10^7$ kW h , where = _____. (speed of light = 3×10^8 m s⁻¹) *Answer:* _____

Q58. The sum of sigma and pi bonds in Hex-1,3-dien-5-yne is _____. *Answer:* _____

Q59. Total number of molecules/species from following which will be paramagnetic is _____
Answer: _____

Q60. The hydrogen electrode is dipped in a solution of pH = 3 at 25°C . The potential of the electrode will be - _____ $\times 10^{-2}$ V . $2.303 RT F = 0.059$ V Round off the answer to the nearest integer. *Answer:* _____

Mathematics

Section A: Multiple Choice Questions (MCQ)

Q61. If the value of is , where are natural numbers and , then is equal to :

- (A) 40
- (B) 52

(C) 50

(D) 54

Q62. Let $\vec{a} = 3\hat{i} + \hat{j} - 2\hat{k}$, $\vec{b} = 4\hat{i} + \hat{j} + 7\hat{k}$ and $\vec{c} = \hat{i} - 3\hat{j} + 4\hat{k}$ be three vectors. If a vector \vec{r} satisfies $\vec{r} \times \vec{a} = \vec{b} \times \vec{c}$ and $\vec{r} \cdot \vec{a} = 0$, then $|\vec{r}|$ is equal to

(A) 24

(B) 36

(C) 28

(D) 32

Q63. For $\theta \in (0, \frac{\pi}{2})$ let $3\sin(\theta + \frac{\pi}{6}) = 2\sin(\theta - \frac{\pi}{6})$ and a real number x be such that $\tan x = \tan \theta$. Then the value of x is equal to

(A) $-\frac{\pi}{5}$ (B) $\frac{\pi}{5}$ (C) $\frac{2\pi}{3}$ (D) $-\frac{2\pi}{3}$

Q64. Let S and T be two sets. Let R be a relation on S defined by $(x, y) \in R$ if and only if $x - y$ is an even integer. Then the relation R is

(A) an equivalence relation.

(B) reflexive and symmetric but not transitive.

(C) transitive but not symmetric.

(D) reflexive but not symmetric.

Q65. Let $f, g: [0, \infty) \rightarrow \mathbb{R}$ be two functions defined by $f(x) = x^2 - t^2$ and $g(x) = 0$. Then the value of $9 \log_3 9 + g \log_3 9$ is equal to

(A) 6

(B) 9

(C) 8

(D) 10

Q66. Between the following two statements: Statement I : Let \vec{a} and \vec{b} be two vectors. Then the vector \vec{c} satisfying $\vec{c} \cdot \vec{a} = \vec{c} \cdot \vec{b}$ and $|\vec{c}| = 1$ is of magnitude $\frac{1}{\sqrt{2}}$. Statement II : In a triangle ABC , if $\angle C = 90^\circ$, then $\sin^2 A + \sin^2 B = 1$.

(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.

Q67. If the domain of the function $f(x) = \frac{1}{x^2 - 4}$ is $\mathbb{R} \setminus \{-2, 2\}$, then $\lim_{x \rightarrow 2} f(x)$ is equal to :

(A) 32

(B) 40

(C) 24

(D) 36

Q68. Let $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = \hat{i} - \hat{j} + \hat{k}$, $\vec{c} = \hat{i} + \hat{j} - \hat{k}$, $\vec{d} = \hat{i} - \hat{j} - \hat{k}$, $\vec{e} = \hat{i} + \hat{j} + \hat{k}$, $\vec{f} = \hat{i} - \hat{j} + \hat{k}$, $\vec{g} = \hat{i} + \hat{j} - \hat{k}$, $\vec{h} = \hat{i} - \hat{j} - \hat{k}$. Let a vector \vec{r} be such that the angle between \vec{r} and \vec{a} is $\frac{\pi}{4}$ and $|\vec{r}| = 6$. If $|\vec{r} \cdot \vec{a}| = 32$, then the value of $|\vec{r} \times \vec{a}|$ is equal to

- (A) 90
- (B) 75
- (C) 95
- (D) 85

Q69. The area of the region , : $2x < 4$, $x - 1 < 2 - 3 - 4 > 0$, 3 is

- (A) $16/3$
- (B) $64/3$
- (C) $8/3$
- (D) $32/3$

Q70. If $x^2 - 2x + 2y + 2g + 2h = 0$ is the locus of a point, which moves such that it is always equidistant from the lines $x + 2y + 7 = 0$ and $2x - y + 8 = 0$, then the value of $g + h$ equals

- (A) 14
- (B) 6
- (C) 8
- (D) 29

Q71. Let P and Q , where O is the origin. If the area of the parallelogram with adjacent sides \vec{OP} and \vec{OQ} is 15 sq. units, then the area (in sq. units) of the quadrilateral is equal to :

- (A) 32
- (B) 40
- (C) 38
- (D) 35

Q72. If $\vec{a} \cdot \vec{b} = 6$, then equals

- (A) 64
- (B) 196
- (C) 144
- (D) 100

Q73. The shortest distance between lines L_1 and L_2 , where $L_1 : -12x + y - 3 = 0$ and L_2 is the line passing through the points $(-4, 4)$, $(3, -1)$, $(6, 3)$ and perpendicular to the line $-3x - 2y = 3$, is

- (A) $12\sqrt{2}$
- (B) $24\sqrt{17}$
- (C) $14\sqrt{22}$
- (D) $42\sqrt{17}$

Q74. If the set S has elements a and b , where $a + b = 12$, then the value of $a^2 + b^2$ is

- (A) 12
- (B) 4
- (C) 8
- (D) 5

- Q75.** Let P be the foot of the perpendicular from the point on the line L . Let the line M , intersect the line L at Q . Then PQ is equal to :
- (A) 25
(B) 19
(C) 29
(D) 27
- Q76.** Let S_n denote the sum of the first n terms of an arithmetic progression. If $S_{10} = 390$ and the ratio of the tenth and the fifth terms is $15 : 7$, then $S_{15} - S_5$ is equal to:
- (A) 800
(B) 890
(C) 790
(D) 690
- Q77.** Let \vec{a} , \vec{b} , \vec{c} where a, b, c are integers and θ is an angle. Let the values of the ordered pair (θ, ϕ) , for which the area of the parallelogram of diagonals $\vec{a} + \vec{b}$ and $\vec{a} + \vec{c}$ is $\frac{1}{2}|\vec{a}|^2 \sin \theta$, be (θ, ϕ) . Then $\theta + \phi$ is equal to
- (A) 19
(B) 17
(C) 24
(D) 21
- Q78.** The number of different 5 digit numbers greater than 50000 that can be formed using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, such that the sum of their first and last digits should not be more than 8, is
- (A) 4608
(B) 5720
(C) 5719
(D) 4607
- Q79.** A company has two plants and to manufacture motorcycles. 60% motorcycles are manufactured at plant P_1 and the remaining are manufactured at plant P_2 of the motorcycles manufactured at plant P_1 are rated of the standard quality, while 80% of the motorcycles manufactured at plant P_2 are rated of the standard quality. A motorcycle picked up randomly from the total production is found to be of the standard quality. If P is the probability that it was manufactured at plant P_1 , then P is
- (A) $\frac{5}{14}$
(B) $\frac{6}{11}$
(C) $\frac{6}{13}$
(D) $\frac{5}{13}$
- Q80.** Let A and B be two square matrices of order n . If C is the matrix of cofactors of the elements of A , then CB is equal to :
- (A) $64B$
(B) $216B$
(C) $343B$
(D) $125B$

Section B: Integer Type Questions

- Q81.** The area of the region enclosed by the parabola $(x - 2)^2 = -1$, the line $x - 2 + 4 = 0$ and the positive coordinate axes is _____. *Answer:* _____
- Q82.** If $\frac{a}{b}$, where a and b are rational numbers, then $\frac{a}{b}$ is equal to _____. *Answer:* _____
- Q83.** If the orthocentre of the triangle formed by the lines $ax + by + c = 0$, $bx + cy + a = 0$ and $cx + ay + b = 0$ is the centroid of another triangle, whose circumcentre and orthocentre respectively are (x_1, y_1) and (x_2, y_2) , then the value of $x_1^2 + y_1^2 + x_2^2 + y_2^2$ is _____. *Answer:* _____
- Q84.** The square of the distance of the image of the point $(1, 2)$ in the line $x + y = 0$, from the origin is _____. *Answer:* _____
- Q85.** The value of $\lfloor \log_{10} 1000 \rfloor$, where $\lfloor x \rfloor$ denotes the greatest integer less than or equal to x , is _____. *Answer:* _____
- Q86.** The number of 3-digit numbers, that are divisible by 2 and 3, but not divisible by 4 and 9, is _____. *Answer:* _____
- Q87.** The coefficient of x^{2012} in the expansion of $(1 - x)^{2008} (1 + x + x^2)^{2007}$ is equal to _____. *Answer:* _____
- Q88.** In a tournament, a team plays 10 matches with probabilities of winning and losing each match as $\frac{1}{2}$ and $\frac{1}{4}$ respectively. Let X be the number of matches that the team wins, and Y be the number of matches that team loses. If the probability $P(X = Y)$ is $\frac{1}{2^n}$, then n equals _____. *Answer:* _____
- Q89.** A group of students appeared in an examination of subjects - Mathematics, Physics & Chemistry. It was found that all students passed in at least one of the subjects, students passed in Mathematics, students passed in Physics, students passed in Chemistry, at most students passed in both Mathematics and Physics, at most students passed in both Physics and Chemistry, at most students passed in both Mathematics and Chemistry. The maximum number of students passed in all the three subjects is _____. *Answer:* _____
- Q90.** 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 _____. *Answer:* _____

Answer Key

Physics

Section A (MCQ):

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

Section B (Integer):

Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
16	2	4	8	1	7	4	200	8	13

Chemistry

Section A (MCQ):

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

Section B (Integer):

Q51	Q52	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60
6	108	82	4	1655	2	1	15	6	18

Mathematics

Section A (MCQ):

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

Section B (Integer):

Q81	Q82	Q83	Q84	Q85	Q86	Q87	Q88	Q89	Q90
5	6	16	62	155	125	0	8288	10	3734