

PYQSide

JEE MAIN 2026 (ONLINE) 22ND JANUARY EVENING SHIFT — QUESTION PAPER

Max. Marks: 300

Questions: 75

Section A (MCQ)

- Q.1** In an open organ pipe v_3 and v_6 are 3rd and 6th harmonic frequencies, respectively. If $v_6 - v_3 = 2200$ Hz then length of the pipe is _____ mm.

(Take velocity of sound in air is 330 m/s.)

[JEE Main 2026 (Online) 22nd January Evening Shift]

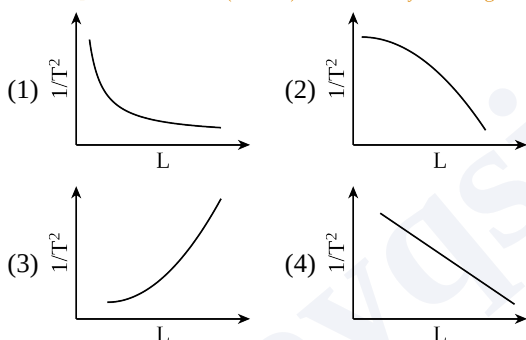
- (1) 200 (2) 225 (3) 275 (4) 250

Scan or tap for the full solution



- Q.2** Using a simple pendulum experiment g is determined by measuring its time period T . Which of the following plots represent the correct relation between the pendulum length L and time period T ?

[JEE Main 2026 (Online) 22nd January Evening Shift]

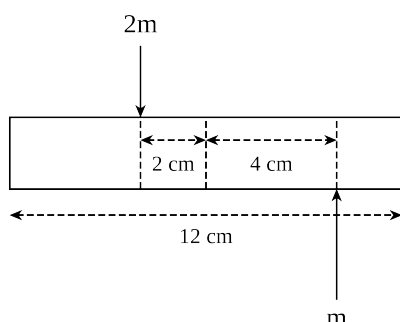


Scan or tap for the full solution



- Q.3** A uniform bar of length 12 cm and mass 20 m lies on a smooth horizontal table. Two point masses m and $2m$ are moving in opposite directions with same speed of v and in the same plane as the bar, as shown in figure. These masses strike the bar simultaneously and get stuck to it. After collision the entire system is rotating with angular frequency ω . The ratio of v and ω is :

[JEE Main 2026 (Online) 22nd January Evening Shift]



- (1) 33 (2)
- $2\sqrt{88}$
- (3) 32 (4) 66

Scan or tap for the full solution



- Q.4** A laser beam has intensity of 4.0×10^{14} W/m². The amplitude of magnetic field associated with beam is _____ T.

(Take $\epsilon_0 = 8.85 \times 10^{-12}$ C²/Nm² and $c = 3 \times 10^8$ m/s)

[JEE Main 2026 (Online) 22nd January Evening Shift]

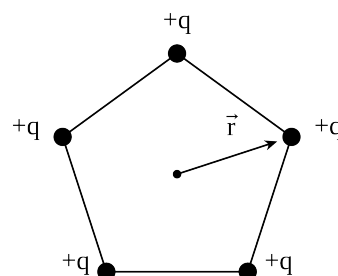
- (1) 1.83 (2) 2.0 (3) 5.5 (4) 18.3

Scan or tap for the full solution



- Q.5** Five positive charges each having charge q are placed at the vertices of a pentagon as shown in the figure. The electric potential (V) and the electric field ($\vec{E}$) at the center O of the pentagon due to these five positive charges are :

[JEE Main 2026 (Online) 22nd January Evening Shift]



(1) $V = \frac{5q}{4\pi\epsilon_0 r}$ and $\vec{E} = \frac{5\sqrt{3}q}{8\pi\epsilon_0 r^2} \hat{r}$

(2) $V = \frac{5q}{4\pi\epsilon_0 r}$ and $\vec{E} = 0$

(3) $V = 0$ and $\vec{E} = 0$

(4) $V = \frac{5q}{4\pi\epsilon_0 r}$ and $\vec{E} = \frac{5q}{4\pi\epsilon_0 r^2} \hat{r}$

Scan or tap for the full solution



- Q.6** Given below are two statements :

Statement-I: An object moves from position r_1 to position r_2 under a conservative force field $\vec{F}$. The work done by the force is $W = -\int_{r_1}^{r_2} \vec{F} \cdot d\vec{r}$.

Statement-II: Any object moving from one location to another location can follow infinite

number of paths. Therefore, the amount of work done by the object changes with the path it follows for a conservative force.

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

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) Statement-I is true but Statement-II is false
- (2) Statement-I is false but Statement-II is true
- (3) Both Statement-I and Statement-II are false
- (4) Both Statement-I and Statement-II are true

Scan or tap for the full solution



- Q.7** When a part of a straight capillary tube is placed vertically in a liquid, the liquid rises up to certain height h . If the inner radius of the capillary tube, density of the liquid and surface tension of the liquid decrease by 1% each, then the height of the liquid in the tube will change by _____ %.

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) +3 (2) +1 (3) -1 (4) -3

Scan or tap for the full solution



- Q.8** Given below are two statements :

Statement-I: A satellite is moving around earth in the orbit very close to the earth surface. The time period of revolution of satellite depends upon the density of earth.

Statement-II: The time period of revolution of the satellite is $T = 2\pi\sqrt{\frac{R_e}{g}}$ (for satellite very close to the earth surface), where R_e is radius of earth and g is acceleration due to gravity.

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

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) Statement-I is true but Statement-II is false
- (2) Statement-I is false but Statement-II is true
- (3) Both Statement-I and Statement-II are true
- (4) Both Statement-I and Statement-II are false

Scan or tap for the full solution



- Q.9** Consider two boxes containing ideal gases A and B such that their temperatures, pressures and number densities are same. The molecular size of A is half of that of B and mass of molecule A is four times that of B. If the collision frequency in gas B is 32×10^{18} /s then collision frequency in gas A is _____ /s.

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 8×10^{18}
- (3) 32×10^{18}

- (2) 2×10^{18}
- (4) 4×10^{18}

Scan or tap for the full solution



- Q.10** In parallax method for the determination of focal length of a concave mirror, the object should always be placed:

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) between the focus (F) and the centre of curvature (C) of the mirror ONLY
- (2) between the pole (P) and the focus (F) of the concave mirror ONLY
- (3) at any point beyond the focus (F) of the mirror
- (4) beyond the centre of the curvature (C) of the mirror ONLY

Scan or tap for the full solution



- Q.11** The wavelength of light, while it is passing through water is 540 nm. The refractive index of water is $4/3$. The wavelength of the same light when it is passing through a transparent medium having refractive index of $3/2$ is _____ nm.

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 540 (2) 840 (3) 480 (4) 380

Scan or tap for the full solution



- Q.12** The smallest wavelength of Lyman series is 91 nm. The difference between the largest wavelengths of Paschen and Balmer series is nearly _____ nm.

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 1784 (2) 1875 (3) 1217 (4) 1550

Scan or tap for the full solution



- Q.13** An electric power line having total resistance of 2Ω , delivers 1 kW of power at 250 V. The percentage efficiency of transmission line is _____.

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 96.9 (2) 92.5 (3) 86.5 (4) 100

Scan or tap for the full solution



- Q.14** Three small identical bubbles of water having same charge on each coalesce to form a bigger bubble. Then the ratio of the potentials on one initial bubble and that on the resultant bigger bubble is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) $1:3^{2/3}$ (2) $3^{2/3}:1$ (3) $1:3^{1/3}$ (4) $1:2^{2/3}$

Scan or tap for the full solution



- Q.15** Given below are two statements :

Statement-I: For a mechanical system of many particles total kinetic energy is the sum of kinetic

energies of all the particles.

Statement-II: The total kinetic energy can be the sum of kinetic energy of the center of mass w.r.t. the origin and the kinetic energy of all the particles w.r.t. the center of mass as the reference.

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

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) Both Statement-I and Statement-II are false
 (2) Statement-I is false but Statement-II is true
 (3) Statement-I is true but Statement-II is false
 (4) Both Statement-I and Statement-II are true

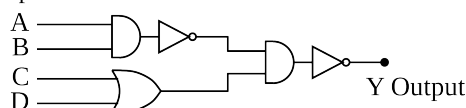
Scan or tap for the full solution



Q.16 The correct truth table for the given input data of the following logic gate is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

Inputs



(1)	Inputs				Output
	A	B	C	D	Y
	1	1	0	1	1
	0	0	1	1	0
	1	0	1	0	0
(2)	Inputs				Output
	A	B	C	D	Y
	1	1	0	1	0
	0	0	1	1	1
	1	0	1	0	1
(3)	Inputs				Output
	A	B	C	D	Y
	1	1	0	1	1
	0	0	1	1	0
	1	0	1	0	1
(4)	Inputs				Output
	A	B	C	D	Y
	1	1	0	1	0
	0	0	1	1	0
	1	0	1	0	1

Scan or tap for the full solution



Q.17 If ϵ , E and t represent the free space permittivity, electric field and time respectively, then the unit of $\frac{\epsilon E}{t}$ will be :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) Am (2) A/m (3) A/m² (4) Am²

Scan or tap for the full solution



Q.18 Which of the following are true for a single slit diffraction?

- A. Width of central maxima increases with increase in wavelength keeping slit width constant.
 B. Width of central maxima increases with decrease in wavelength keeping slit width constant.
 C. Width of central maxima increases with decrease in slit width at constant wavelength.
 D. Width of central maxima increases with increase in slit width at constant wavelength.

E. Brightness of central maxima increases for decrease in wavelength at constant slit width.

[JEE Main 2026 (Online) 22nd January Evening Shift]

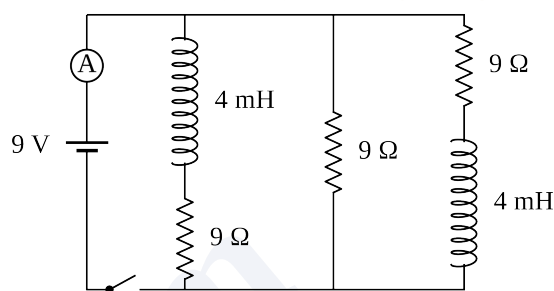
- (1) B, D only (2) A, D only
 (3) A, C, E only (4) B, C only

Scan or tap for the full solution



Q.19 Figure shows the circuit that contains three resistances ($9\ \Omega$ each) and two inductors ($4\ \text{mH}$ each). The reading of ammeter at the moment switch K is turned ON, is _____ A.

[JEE Main 2026 (Online) 22nd January Evening Shift]



- (1) 2 (2) 3 (3) 1 (4) zero

Scan or tap for the full solution



Q.20 Light is incident on a metallic plate having work function $110 \times 10^{-20}\ \text{J}$. If the produced photoelectrons have zero kinetic energy then the angular frequency of the incident light is _____ rad/s. ($h = 6.63 \times 10^{-34}\ \text{J s}$)

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 1.04×10^{13} (2) 1.66×10^{16}
 (3) 1.66×10^{15} (4) 1.04×10^{16}

Scan or tap for the full solution

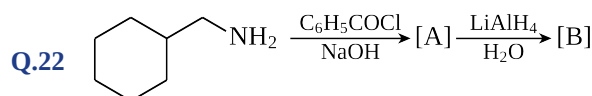


Q.21 Among H_2S , H_2O , NF_3 , NH_3 and CHCl_3 , identify the molecule (X) with lowest dipole moment value. The number of lone pairs of electrons present on the central atom of the molecule (X) is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

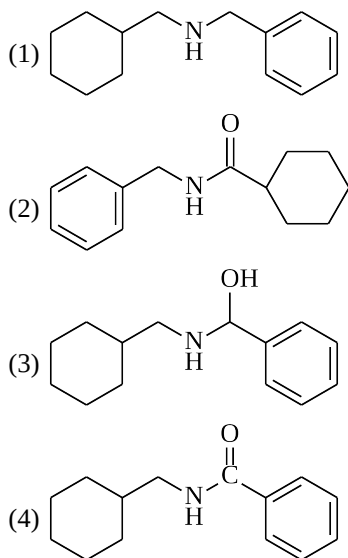
- (1) 3 (2) 2 (3) 0 (4) 1

Scan or tap for the full solution



The final product [B] is :

[JEE Main 2026 (Online) 22nd January Evening Shift]



Scan or tap for the full solution



Q.23 Given below are two statements :

Statement-I: $C < O < N < F$ is the correct order in terms of first ionization enthalpy values.

Statement-II: $S > Se > Te > Po > O$ is the correct order in terms of the magnitude of electron gain enthalpy values.

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

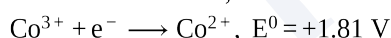
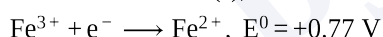
[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) Both Statement-I and Statement-II are false
- (2) Statement-I is false but Statement-II is true
- (3) Statement-I is true but Statement-II is false
- (4) Both Statement-I and Statement-II are true

Scan or tap for the full solution



Q.24 Consider the following reduction processes :



The tendency to act as reducing agent decreases in the order :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) $\text{Al} > \text{Fe}^{2+} > \text{Cr} > \text{Co}^{2+}$
- (2) $\text{Al} > \text{Cr} > \text{Co}^{2+} > \text{Fe}^{2+}$
- (3) $\text{Cr} > \text{Fe}^{2+} > \text{Al} > \text{Co}^{2+}$
- (4) $\text{Al} > \text{Cr} > \text{Fe}^{2+} > \text{Co}^{2+}$

Scan or tap for the full solution



Q.25 The compound A, $\text{C}_8\text{H}_8\text{O}_2$ reacts with acetophenone to form a single product via cross-Aldol condensation. The compound A on reaction with conc. NaOH forms a substituted benzyl alcohol with one of the two products. The compound A is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 2-hydroxy acetophenone
- (2) 4-hydroxy benzaldehyde
- (3) 4-methyl benzoic acid
- (4) 4-methoxy benzaldehyde

Scan or tap for the full solution



Q.26 Match List-I with List-II.

List-I Reaction of Glucose with		List-II Product formed	
A.	Hydroxylamine	I.	Gluconic acid
B.	Br_2 water	II.	Glucose pentaacetate
C.	Excess acetic anhydride	III.	Saccharic acid
D.	Concentrated HNO_3	IV.	Glucoxime

Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) A-IV, B-III, C-II, D-I (2) A-I, B-III, C-IV, D-II
- (3) A-III, B-I, C-IV, D-II (4) A-IV, B-I, C-II, D-III

Scan or tap for the full solution



Q.27 Identify the correct statements :

Choose the correct answer from the options given below :

- A. Hydrated salts can be used as primary standard.
- B. Primary standard should not undergo any reaction with air.
- C. Reactions of primary standard with another substance should be instantaneous and stoichiometric.
- D. Primary standard should not be soluble in water.
- E. Primary standard should have low relative molar mass.

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) D and E Only (2) A, B and E Only
- (3) A, B, C and E Only (4) A, B and C Only

Scan or tap for the full solution



Q.28 Correct statements regarding Arrhenius equation among the following are :

- A. Factor $e^{-E_a/RT}$ corresponds to fraction of molecules having kinetic energy less than E_a .
- B. At a given temperature, lower the E_a , faster is the reaction.
- C. Increase in temperature by about 10°C doubles the rate of reaction.
- D. Plot of $\log k$ vs $\frac{1}{T}$ gives a straight line with

$$\text{slope} = -\frac{E_a}{R}.$$

Choose the correct answer from the options given below :

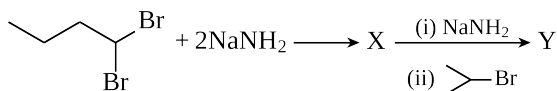
[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) A and B Only (2) B and D Only
(3) B and C Only (4) A and C Only

Scan or tap for the full solution



Q.29 Consider the following reaction :



The product Y formed is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 2-methylhex-3-yne (2) 5-methylhex-2-yne
(3) Isopropylbut-1-yne (4) 2-methylhex-2-yne

Scan or tap for the full solution



Q.30 $[\text{Ni}(\text{PPh}_3)_2\text{Cl}_2]$ is a paramagnetic complex. Identify the INCORRECT statements about this complex.

- A. The complex exhibits geometrical isomerism.
B. The complex is white in colour.
C. The calculated spin-only magnetic moment of the complex is 2.84 BM.
D. The calculated CFSE (Crystal Field Stabilization Energy) of Ni in this complex is $-0.8\Delta_o$.
E. The geometrical arrangement of ligands in this complex is similar to that in $\text{Ni}(\text{CO})_4$.

Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 22nd January Evening Shift]

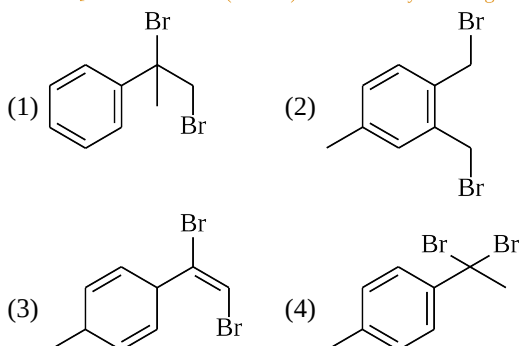
- (1) C and D Only (2) A, B and D Only
(3) C, D and E Only (4) A and B Only

Scan or tap for the full solution



Q.31 The dibromo compound [P] (molecular formula: $\text{C}_9\text{H}_{10}\text{Br}_2$) when heated with excess sodamide followed by treatment with dilute HCl gives [Q]. On warming [Q] with mercuric sulphate and dilute sulphuric acid yields [R] which gives positive Iodoform test but negative Tollens' test. The compound [P] is :

[JEE Main 2026 (Online) 22nd January Evening Shift]



Scan or tap for the full solution



Q.32 Which of the following mixture gives a buffer solution with $\text{pH} = 9.25$?

Given : $\text{pK}_b(\text{NH}_4\text{OH}) = 4.75$

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 0.5 M NH_4OH (0.2 L) + 0.2 M HCl (0.5 L)
(2) 0.2 M NH_4OH (0.5 L) + 0.1 M HCl (0.5 L)
(3) 0.2 M NH_4OH (0.4 L) + 0.1 M HCl (1 L)
(4) 0.4 M NH_4OH (1 L) + 0.1 M HCl (1 L)

Scan or tap for the full solution



Q.33 When 1 g of compound (X) is subjected to Kjeldahl's method for estimation of nitrogen, 15 mL 1 M H_2SO_4 was neutralized by ammonia evolved. The percentage of nitrogen in compound (X) is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 0.21 (2) 21 (3) 42 (4) 0.42

Scan or tap for the full solution



Q.34 The energy of first (lowest) Balmer line of H atom is x J. The energy (in J) of second Balmer line of H atom is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) $\frac{x}{1.35}$ (2) $1.35x$ (3) x^2 (4) $2x$

Scan or tap for the full solution



Q.35 Given below are two statements :

Statement-I: The first ionization enthalpy of Cr is lower than that of Mn.

Statement-II: The second and third ionization enthalpies of Cr are higher than those of Mn.

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

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) Statement-I is true but Statement-II is false
(2) Both Statement-I and Statement-II are true
(3) Both Statement-I and Statement-II are false
(4) Statement-I is false but Statement-II is true

Scan or tap for the full solution



Q.36 At T(K), 100 g of 98% H_2SO_4 (w/w) aqueous solution is mixed with 100 g of 49% H_2SO_4 (w/w) aqueous solution. What is the mole fraction of H_2SO_4 in the resultant solution?

(Given : Atomic mass H = 1 u; S = 32 u; O = 16 u).
(Assume that temperature after mixing remains constant)

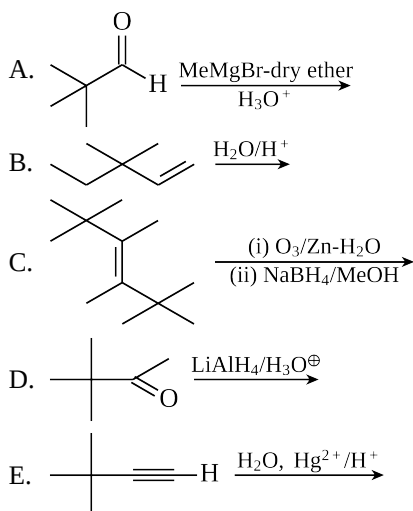
[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 0.9 (2) 0.663 (3) 0.1 (4) 0.337

Scan or tap for the full solution



Q.37 3,3-Dimethyl-2-butanol cannot be prepared by :



Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) B and E Only (2) B, C and E Only
(3) B and C Only (4) B Only

Scan or tap for the full solution



Q.38 $A + 2B \longrightarrow AB_2$

36.0 g of 'A' (Molar mass : 60 g mol^{-1}) and 56.0 g of 'B' (Molar mass : 80 g mol^{-1}) are allowed to react. Which of the following statements are correct ?

- A. 'A' is the limiting reagent.
B. 77.0 g of AB_2 is formed.
C. Molar mass of AB_2 is 140 g mol^{-1} .
D. 15.0 g of A is left unreacted after the completion of reaction.

Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) A and C Only (2) A and B Only
(3) C and D Only (4) B and D Only

Scan or tap for the full solution



Q.39 Given below are two statements :

Statement-I: Elements 'X' and 'Y' are the most and least electronegative elements, respectively among N, As, Sb and P. The nature of the oxides X_2O_3 and Y_2O_3 is acidic and amphoteric, respectively.

Statement-II: BCl_3 is covalent in nature and gets hydrolysed in water. It produces $[B(OH)_4]^-$ and $[B(H_2O)_6]^{3+}$ in aqueous medium.

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

[JEE Main 2026 (Online) 22nd January Evening Shift]

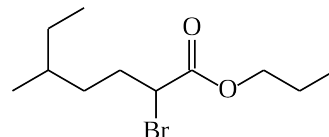
- (1) Statement-I is false but Statement-II is true
(2) Statement-I is true but Statement-II is false
(3) Both Statement-I and Statement-II are false
(4) Both Statement-I and Statement-II are true

Scan or tap for the full solution



Q.40 The IUPAC name of the following compound is :

[JEE Main 2026 (Online) 22nd January Evening Shift]



- (1) 2-bromo-5-methylhexylpropanoate
(2) n-propyl-1-bromo-4-methylhexanoate
(3) n-propyl-2-bromo-5-methylheptanoate
(4) 2-bromo-5-methylpropanoate

Scan or tap for the full solution



Q.41 Let $f(x) = [x]^2 - [x+3] - 3$, $x \in \mathbb{R}$, where $[.]$ is the greatest integer function. Then

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) $f(x) = 0$ for finitely many values of x
(2) $f(x) < 0$ only for $x \in [-1, 3)$
(3) $\int_0^2 f(x) dx = -6$
(4) $f(x) > 0$ only for $x \in [4, \infty)$

Scan or tap for the full solution



Q.42 Let the locus of the mid-point of the chord through the origin O of the parabola $y^2 = 4x$ be the curve S. Let P be any point on S. Then the locus of the point, which internally divides OP in the ratio 3 : 1, is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) $2x^2 = 3y$ (2) $2y^2 = 3x$ (3) $3y^2 = 2x$ (4) $3x^2 = 2y$

Scan or tap for the full solution



Q.43 Let n be the number obtained on rolling a fair die. If the probability that the system

$$\begin{aligned} x - ny + z &= 6 \\ x + (n-2)y + (n+1)z &= 8 \\ (n-1)y + z &= 1 \end{aligned}$$

has a unique solution is $\frac{k}{6}$, then the sum of k and all possible values of n is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 22 (2) 20 (3) 24 (4) 21

Scan or tap for the full solution



Q.44 Let the domain of the function

$$f(x) = \log_3 \log_5 (7 - \log_2 (x^2 - 10x + 85)) + \sin^{-1} \left(\left| \frac{3x-7}{17-x} \right| \right)$$

be $(\alpha, \beta]$. Then $\alpha + \beta$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 12 (2) 8 (3) 10 (4) 9

Scan or tap for the full solution



Q.45 Let S and S' be the foci of the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ and P(α, β) be a point on the ellipse in the first quadrant. If $(SP)^2 + (S'P)^2 - SP \cdot S'P = 37$, then $\alpha^2 + \beta^2$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 13 (2) 15 (3) 11 (4) 17

Scan or tap for the full solution



Q.46 If $\lim_{x \rightarrow 0} \frac{e^{(a-1)x} + 2\cos bx + (c-2)e^{-x}}{x\cos x - \log_e(1+x)} = 2$, then $a^2 + b^2 + c^2$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 3 (2) 5 (3) 9 (4) 7

Scan or tap for the full solution



Q.47 Let $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$ and $\vec{b} = \lambda\hat{j} + 2\hat{k}$, $\lambda \in \mathbb{Z}$ be two vectors. Let $\vec{c} = \vec{a} \times \vec{b}$ and $\vec{d}$ be a vector of magnitude 2 in yz-plane. If $|\vec{c}| = \sqrt{53}$, then the maximum possible value of $(\vec{c} \cdot \vec{d})^2$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 52 (2) 26 (3) 104 (4) 208

Scan or tap for the full solution



Q.48 Let $[\cdot]$ denote the greatest integer function, and let $f(x) = \min \{ \sqrt{2}x, x^2 \}$. Let $S = \{x \in (-2, 2) : \text{the function } g(x) = |x| [x^2] \text{ is discontinuous at } x\}$. Then $\sum_{x \in S} f(x)$ equals

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) $2 - \sqrt{2}$ (2) $2\sqrt{6} - 3\sqrt{2}$
(3) $1 - \sqrt{2}$ (4) $\sqrt{6} - 2\sqrt{2}$

Scan or tap for the full solution



Q.49 The number of elements in the relation $\text{R} = \{(x, y) : 4x^2 + y^2 < 52, x, y \in \mathbb{Z}\}$ is

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 86 (2) 67 (3) 89 (4) 77

Scan or tap for the full solution



Q.50 Among the statements

(S1) : If A(5, -1) and B(-2, 3) are two vertices of a triangle, whose orthocentre is (0, 0), then its third vertex is (-4, -7) and

(S2) : If positive numbers 2a, b, c are three consecutive terms of an A.P., then the lines $ax + by + c = 0$ are concurrent at (2, -2),

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) both are incorrect (2) only (S2) is correct
(3) both are correct (4) only (S1) is correct

Scan or tap for the full solution



Q.51 Let α, β be the roots of the quadratic equation $12x^2 - 20x + 3\lambda = 0$, $\lambda \in \mathbb{Z}$. If $\frac{1}{2} \leq |\beta - \alpha| \leq \frac{3}{2}$, then the sum of all possible values of λ is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 3 (2) 6 (3) 1 (4) 4

Scan or tap for the full solution



Q.52 Let f and g be functions satisfying $f(x + y) = f(x)f(y)$, $f(1) = 7$ and $g(x + y) = g(xy)$, $g(1) = 1$, for all $x, y \in \mathbb{N}$. If $\sum_{x=1}^n \left(\frac{f(x)}{g(x)} \right) = 19607$, then n is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 6 (2) 7 (3) 4 (4) 5

Scan or tap for the full solution



Q.53 If $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ is a solution of the system of equations

$$AX = B, \text{ where } \text{adj } A = \begin{bmatrix} 4 & 2 & 2 \\ -5 & 0 & 5 \\ 1 & -2 & 3 \end{bmatrix} \text{ and } B = \begin{bmatrix} 4 \\ 0 \\ 2 \end{bmatrix},$$

then $|x + y + z|$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 3 (2) 2 (3) $\frac{3}{2}$ (4) 1

Scan or tap for the full solution



Q.54 The area of the region

$$A = \{(x, y) : 4x^2 + y^2 \leq 8 \text{ and } y^2 \leq 4x\} \text{ is:}$$

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) $\pi + \frac{2}{3}$ (2) $\frac{\pi}{2} + 2$ (3) $\pi + 4$ (4) $\frac{\pi}{2} + \frac{1}{3}$

Scan or tap for the full solution



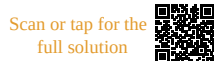
- Q.55** Let L be the line $\frac{x+1}{2} = \frac{y+1}{3} = \frac{z+3}{6}$ and let S be the set of all points (a, b, c) on L , whose distance from the line $\frac{x+1}{2} = \frac{y+1}{3} = \frac{z-9}{0}$ along the line L is 7. Then $\sum_{(a, b, c) \in S} (a+b+c)$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]
(1) 28 (2) 6 (3) 40 (4) 34



- Q.56** If $y = y(x)$ satisfies the differential equation $16(\sqrt{9x+x}\sqrt{x})(4+\sqrt{9+\sqrt{x}})\cos y dy = (1+2\sin y) dx$, $x \geq 0$ and $y(256) = \frac{\pi}{2}$, $y(49) = \alpha$, then $2\sin \alpha$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]
(1) $2\sqrt{2} - 1$ (2) $\sqrt{2} - 1$
(3) $2(\sqrt{2} - 1)$ (4) $3(\sqrt{2} - 1)$



- Q.57** Let $P(10, 2\sqrt{15})$ be a point on the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, whose foci are S and S' . If the length of its latus rectum is 8, then the square of the area of $\Delta PSS'$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]
(1) 4200 (2) 1462 (3) 900 (4) 2700



- Q.58** If the mean deviation about the median of the numbers $k, 2k, 3k, \dots, 1000k$ is 500, then k^2 is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]
(1) 1 (2) 16 (3) 9 (4) 4



- Q.59** Let $S = \{z \in \mathbb{C} : 4z^2 + \bar{z} = 0\}$. Then $\sum_{z \in S} |z|^2$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]
(1) $\frac{5}{64}$ (2) $\frac{1}{16}$ (3) $\frac{7}{64}$ (4) $\frac{3}{16}$



- Q.60** Let C_r denote the coefficient of x^r in the binomial expansion of $(1+x)^n$, $n \in \mathbb{N}$, $0 \leq r \leq n$. If

$$P_n = C_0 - C_1 + \frac{2^2}{3}C_2 - \frac{2^3}{4}C_3 + \dots + \frac{(-2)^n}{n+1}C_n, \text{ then the}$$

value of $\sum_{n=1}^{25} \frac{1}{P_{2n}}$ equals

[JEE Main 2026 (Online) 22nd January Evening Shift]

(1) 675 (2) 580 (3) 525 (4) 650

Scan or tap for the full solution 

Section B (Numerical)

- Q.61** An insulated cylinder of volume 60 cm^3 is filled with a gas at 27°C and 2 atmospheric pressure. Then the gas is compressed making the final volume as 20 cm^3 while allowing the temperature to rise to 77°C . The final pressure is _____ atmospheric pressure.

[JEE Main 2026 (Online) 22nd January Evening Shift]



- Q.62** A conducting circular loop is rotated about its diameter at a constant angular speed of 100 rad/s in a magnetic field of 0.5 T perpendicular to the axis of rotation. When the loop is rotated by 30° from the horizontal position, the induced EMF is 15.4 mV . The radius of the loop is _____ mm.

(Take $\pi = \frac{22}{7}$)

[JEE Main 2026 (Online) 22nd January Evening Shift]



- Q.63** A capacitor P with capacitance $10 \times 10^{-6} \text{ F}$ is fully charged with a potential difference of 6.0 V and disconnected from the battery. The charged capacitor P is connected across another capacitor Q with capacitance $20 \times 10^{-6} \text{ F}$. The charge on capacitor Q when equilibrium is established will be $\alpha \times 10^{-5} \text{ C}$ (assume capacitor Q does not have any charge initially), the value of α is _____.

[JEE Main 2026 (Online) 22nd January Evening Shift]



- Q.64** A cylindrical conductor of length 2 m and area of cross-section 0.2 mm^2 carries an electric current of 1.6 A when its ends are connected to a 2 V battery. Mobility of electrons in the conductor is $\alpha \times 10^{-3} \text{ m}^2/\text{V s}$. The value of α is :
(electron concentration $= 5 \times 10^{28} / \text{m}^3$ and electron charge $= 1.6 \times 10^{-19} \text{ C}$)

[JEE Main 2026 (Online) 22nd January Evening Shift]



- Q.65** Two masses m and $2m$ are connected by a light string going over a pulley (disc) of mass $30m$ with radius $r = 0.1 \text{ m}$. The pulley is mounted in a vertical plane and it is free to rotate about its axis. The $2m$ mass is released from rest and its speed when it has descended through a height of 3.6 m is _____ m/s . (Assume string does not slip and $g = 10 \text{ m/s}^2$)

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.66** Consider the following electrochemical cell :
 $\text{Pt} | \text{O}_2(\text{g})(1 \text{ bar}) | \text{HCl}(\text{aq}) || \text{M}^{2+}(\text{aq}, 1.0 \text{ M}) | \text{M}(\text{s})$
 The pH above which, oxygen gas would start to evolve at anode is _____ (nearest integer).
 [Given : $E^\circ_{\text{M}^{2+}/\text{M}} = 0.994 \text{ V}$
 $E^\circ_{\text{O}_2/\text{H}_2\text{O}} = 1.23 \text{ V}$ } standard reduction potential and $\frac{RT}{F}(2.303) = 0.059 \text{ V}$ at the given condition]

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.67** The mass of benzanilide obtained from the benzoylation reaction of 5.8 g of aniline, if yield of product is 82%, is _____ g (nearest integer).
 (Given molar mass in g mol^{-1} H : 1, C : 12, N : 14, O : 16)

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.68** Among the following oxides of 3d elements, the number of mixed oxides are _____.
 Ti_2O_3 , V_2O_4 , Cr_2O_3 , Mn_3O_4 , Fe_3O_4 , Fe_2O_3 , Co_3O_4

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.69** If the enthalpy of sublimation of Li is 155 kJ mol^{-1} , enthalpy of dissociation of F_2 is 150 kJ mol^{-1} , ionization enthalpy of Li is 520 kJ mol^{-1} , electron gain enthalpy of F is -313 kJ mol^{-1} , standard enthalpy of formation of LiF is -594 kJ mol^{-1} . The magnitude of lattice enthalpy of LiF is _____ kJ mol^{-1} . (Nearest Integer)

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.70** Consider $\text{A} \xrightarrow{k_1} \text{B}$ and $\text{C} \xrightarrow{k_2} \text{D}$ are two reactions. If the rate constant (k_1) of the $\text{A} \rightarrow \text{B}$ reaction can be expressed by the following equation
 $\log_{10} k = 14.34 - \frac{1.5 \times 10^4}{T/K}$ and activation energy of $\text{C} \rightarrow \text{D}$ reaction (E_{a_2}) is $\frac{1}{5}$ th of the $\text{A} \rightarrow \text{B}$ reaction (E_{a_1}), then the value of (E_{a_2}) is _____ kJ mol^{-1} . (Nearest Integer)

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.71** Suppose a, b, c are in A.P. and $a^2, 2b^2, c^2$ are in G.P. If $a < b < c$ and $a + b + c = 1$, then $9(a^2 + b^2 + c^2)$ is equal to _____.

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.72** Let a vector $\vec{a} = \sqrt{2}\hat{i} - \hat{j} + \lambda\hat{k}$, $\lambda > 0$, make an obtuse angle with the vector $\vec{b} = -\lambda^2\hat{i} + 4\sqrt{2}\hat{j} + 4\sqrt{2}\hat{k}$ and an angle θ , $\frac{\pi}{6} < \theta < \frac{\pi}{2}$, with the positive z-axis. If the set of all possible values of λ is $(\alpha, \beta) - \{\gamma\}$, then $\alpha + \beta + \gamma$ is equal to _____.

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.73** Let $[.]$ be the greatest integer function. If $\alpha = \int_0^{64} (x^{1/3} - [x^{1/3}])dx$, then $\frac{1}{\pi} \int_0^{\pi} \left(\frac{\sin^2 \theta}{\sin^6 \theta + \cos^6 \theta} \right) d\theta$ is equal to _____.

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.74** Let $\cos(\alpha + \beta) = -\frac{1}{10}$ and $\sin(\alpha - \beta) = \frac{3}{8}$, where $0 < \alpha < \frac{\pi}{3}$ and $0 < \beta < \frac{\pi}{4}$. If $\tan 2\alpha = \frac{3(1-r\sqrt{5})}{\sqrt{11}(s+\sqrt{5})}$, $r, s \in \mathbb{N}$, then $r + s$ is equal to _____.

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



- Q.75** Let S be the set of the first 11 natural numbers. Then the number of elements in $A = \{B \subseteq S : n(B) \geq 2 \text{ and the product of all elements of B is even}\}$ is _____.

[JEE Main 2026 (Online) 22nd January Evening Shift]

Scan or tap for the full solution



ANSWER KEY

Section A (MCQ)

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	2	1	1	1	2	3	2	3	4	3	3
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	3	1	1	4	1	3	3	3	4	4	1
Ques.	23	24	25	26	27	28	29	30	31	32	33
Ans.	4	4	4	4	4	3	1	2	4	2	3
Ques.	34	35	36	37	38	39	40	41	42	43	44
Ans.	2	1	4	1	4	2	3	2	2	1	4
Ques.	45	46	47	48	49	50	51	52	53	54	55
Ans.	1	4	4	3	4	3	1	4	2	1	4

Ques.	56	57	58	59	60						
Ans.	1	4	4	4	1						

Section B (Numerical)

Ques.	61	62	63	64	65	66	67
Ans.	7	14	4	1	2	4	10
Ques.	68	69	70	71	72	73	74
Ans.	3	1031	57	9	5	36	20
Ques.	75						
Ans.	1979						