

PART 1 - PHYSICS

Topic : Units and measurements

SECTION-A : (Maximum Marks : 12)

- This section contains **THREE** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- For each question, choose the option(s) corresponding to (all) the correct answer(s).
- Answer to each question will be evaluated according to the following marking scheme :

Full Marks	: +4	ONLY if (all) the correct option(s) is(are) chosen;
Partial Marks	: +3	If all the four options are correct but ONLY three options are chosen;
Partial Marks	: +2	If three or more options are correct but ONLY two options are chosen, both of which are correct;
Partial Marks	: +1	If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks	: 0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	: -1	In all other cases.
- For example, in a question, if **(A), (B) and (D)** are the ONLY three options corresponding to correct answers, then choosing ONLY (A), (B) and (D) will get +4 marks; choosing ONLY (A) and (B) will get +2 marks; choosing ONLY (A) and (D) will get +2 marks; choosing ONLY (B) and (D) will get +2 marks; choosing ONLY (A) will get +1 mark; choosing ONLY (B) will get +1 mark; choosing ONLY (D) will get +1 mark; choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get -1 marks.

1. Length, breadth and thickness of a strip having a uniform cross section are measured to be 10.5 cm, 0.05 mm, and 6.0 μm , respectively. Which of the following option(s) give(s) the volume of the strip in cm^3 with correct significant figures:

[JEE Advanced 2025 Paper 1]

- (A) 3.2×10^{-5} (B) 32.0×10^{-6} (C) 3.0×10^{-5} (D) 3×10^{-5}

Scan or tap for the full solution



2. A temperature difference can generate e.m.f. in some materials. Let S be the e.m.f. produced per unit temperature difference between the ends of a wire, σ the electrical conductivity and κ the thermal conductivity of the material of the wire. Taking M , L , T , I and K as dimensions of mass, length, time, current and temperature, respectively, the dimensional formula of the quantity $Z = \frac{S^2 \sigma}{\kappa}$ is:

[JEE Advanced 2025 Paper 2]

- (A) $[M^0 L^0 T^0 I^0 K^0]$ (B) $[M^0 L^0 T^0 I^0 K^{-1}]$ (C) $[M^1 L^2 T^{-2} I^{-1} K^{-1}]$ (D) $[M^1 L^2 T^{-4} I^{-1} K^{-1}]$

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3. A dimensionless quantity is constructed in terms of electronic charge e , permittivity of free space ϵ_0 , Planck's constant h , and speed of light c . If the dimensionless quantity is written as $e^\alpha \epsilon_0^\beta h^\gamma c^\delta$ and n is a non-zero integer, then $(\alpha, \beta, \gamma, \delta)$ is given by

[JEE Advanced 2024 Paper 1]

Space for Rough Work

PYQSide

(A) $(2n, -n, -n, -n)$

(B) $(n, -n, -2n, -n)$

(C) $(n, -n, -n, -2n)$

(D) $(2n, -n, -2n, -2n)$

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full solution



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SECTION-B : (Maximum Marks : 12)

- This section contains **THREE** questions.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value of the answer (in decimal notation, truncated / rounded-off to the **SECOND DECIMAL PLACE**; e.g. 6.25, 7.00, -0.33, -0.30, 30.27, -127.30) in the place designated to enter the answer.
- Answer to each question will be evaluated according to the following marking scheme :
 Full Marks : +4 If **ONLY** the correct answer is entered;
 Zero Marks : 0 In all other cases.

4. In a new system of units, the units of mass, length, time and current are 5 kg, 5 m, 5 s and 5 A, respectively. If μ_0 and ϵ_0 are the permeability and permittivity of free space, respectively, then in this new system of units, the magnitude of one SI unit of $\sqrt{\mu_0/\epsilon_0}$, is: [JEE Advanced 2026 Paper 2]

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5. A single slit diffraction experiment is performed to determine the slit width using the equation, $\frac{bd}{D} = m\lambda$, where b is the slit width, D the shortest distance between the slit and the screen, d the distance between the m^{th} diffraction maximum and the central maximum, and λ is the wavelength. D and d are measured with scales of least count of 1 cm and 1 mm, respectively. The values of λ and m are known precisely to be 600 nm and 3, respectively. The absolute error (in μm) in the value of b estimated using the diffraction maximum that occurs for $m = 3$ with $d = 5$ mm and $D = 1$ m is ____ [JEE Advanced 2025 Paper 1]

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6. The dimensions of a cone are measured using a scale with a least count of 2 mm. The diameter of the base and the height are both measured to be 20.0 cm. The maximum percentage error in the determination of the volume is _____. [JEE Advanced 2024 Paper 2]

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Test Pattern : **JEE (Advanced)**

SECTION-A

[illegible]

SECTION-B

[illegible]