CUET 2026 May 26 Shift 2 Physics

Question Paper (Memory-Based) with Solutions

Conducted by National Testing Agency (NTA)

General Instructions

(i) The examination will be conducted in Computer-Based Test (CBT) mode.

(ii) Each question carries +5 marks for correct answer and -1 mark for wrong answer.

(iii) The total number of questions are 50.

(iv) Duration of the exam is 1 hour (60 minutes).

1. Assertion-Reason Type Question

Assertion (A): The magnetic field at the center of a circular current carrying loop is directly proportional to the current flowing through it.

Reason (R): According to Biot–Savart's law, magnetic field produced by a current element is proportional to the current element.

Choose the correct answer from the options given below:

(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(B) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(C) Assertion is true but Reason is false.

(D) Assertion is false but Reason is true.

Correct Answer: (A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Solution:

Step 1: Recall Biot–Savart law.

Magnetic field due to a current element is:

$$dB \propto I$$

Hence magnetic field is directly proportional to current.

Step 2: Magnetic field at the center of circular loop.

For a circular loop:

$$B = \frac{\mu_0 I}{2R}$$

Thus:

$$B \propto I$$

Hence Assertion is true.

Step 3: Check the Reason.

Reason correctly explains why magnetic field depends on current.

Therefore:

Both Assertion and Reason are true and Reason correctly explains Assertion

Quick Tip: Remember:

$$B_{\text{circular loop}} = \frac{\mu_0 I}{2R}$$

Magnetic field increases with current and decreases with radius.

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2. Match the following electromagnetic waves with their correct energy order.

Column I		Column II	
(A)	Gamma rays	(I)	Lowest frequency
(B)	X-rays	(II)	Highest energy
(C)	Microwaves	(III)	Used in radar communication
(D)	Radio waves	(IV)	Used in medical imaging

Choose the correct answer from the options given below:

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

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

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

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

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

Solution:

Step 1: Recall electromagnetic spectrum order.

Energy order:

$$\text{Gamma rays} > \text{X-rays} > \text{UV} > \text{Visible} > \text{IR} > \text{Microwaves} > \text{Radio waves}$$

Step 2: Match each wave.

$$\text{Gamma rays} \rightarrow \text{Highest energy}$$

$$\text{X-rays} \rightarrow \text{Medical imaging}$$

$$\text{Microwaves} \rightarrow \text{Radar communication}$$

$$\text{Radio waves} \rightarrow \text{Lowest frequency}$$

Therefore:

$$\boxed{A-II,\ B-IV,\ C-III,\ D-I}$$

Quick Tip: Remember:

$$E = hf$$

Higher frequency means higher energy.

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3. The ratio of de Broglie wavelength of an electron to that of a proton moving with the same kinetic energy is:

(A) $\sqrt{\frac{m_p}{m_e}}$

(B) $\frac{m_p}{m_e}$

(C) $\sqrt{\frac{m_e}{m_p}}$

(D) 1

Correct Answer: (A) $\sqrt{\frac{m_p}{m_e}}$

Solution:

Step 1: Recall de Broglie wavelength formula.

$$\lambda = \frac{h}{\sqrt{2mK}}$$

where:

$$m = \text{mass}, \qquad K = \text{kinetic energy}$$

Step 2: Compare electron and proton wavelengths.

For same kinetic energy:

$$\lambda \propto \frac{1}{\sqrt{m}}$$

Thus:

$$\frac{\lambda_e}{\lambda_p} = \sqrt{\frac{m_p}{m_e}}$$

Therefore:

$$\boxed{\sqrt{\frac{m_p}{m_e}}}$$

Quick Tip: Remember:

$$\lambda \propto \frac{1}{\sqrt{m}}$$

Lighter particle has greater de Broglie wavelength.

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4. A proton and an alpha particle are accelerated through the same potential difference. The ratio of their kinetic energies will be:

(A) 1 : 1

(B) 1 : 2

(C) 2 : 1

(D) 4 : 1

Correct Answer: (B) 1 : 2

Solution:

Step 1: Recall kinetic energy gained in electric field.

$$K = qV$$

where:

$$q = \text{charge}, \qquad V = \text{potential difference}$$

Step 2: Calculate energies.

For proton:

$$K_p = eV$$

For alpha particle:

$$K_\alpha = 2eV$$

Thus:

$$K_p : K_\alpha = 1 : 2$$

Therefore:

$$\boxed{1 : 2}$$

Quick Tip: Remember:

$$K = qV$$

Greater charge gains greater kinetic energy in same potential difference.

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5. Assertion-Reason Type Question

Assertion (A): Torque acting on a current loop in a magnetic field is maximum when the plane of the loop is parallel to the magnetic field.

Reason (R): Torque on a magnetic dipole is given by:

$$\tau = MB \sin\theta$$

where θ is the angle between magnetic moment and magnetic field.

Choose the correct answer from the options given below:

(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(B) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(C) Assertion is true but Reason is false.

(D) Assertion is false but Reason is true.

Correct Answer: (A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Solution:

Step 1: Recall torque formula.

Torque on a magnetic dipole in a magnetic field is given by:

$$\tau = MB \sin\theta$$

Torque is maximum when:

$$\sin\theta = 1$$

Thus:

$$\theta = 90^\circ$$

Step 2: Relate angle with loop orientation.

Magnetic moment is perpendicular to plane of loop.

If magnetic moment is perpendicular to field:

$$\theta = 90^\circ$$

then plane of loop becomes parallel to magnetic field.

Thus Assertion is true.

Reason is also true and correctly explains Assertion.

Therefore:

Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Quick Tip: Remember:

$$\tau_{max} = MB$$

Maximum torque occurs when magnetic moment is perpendicular to magnetic field.

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6. The focal length of a concave mirror is 20 cm. If the object is placed at 30 cm from the mirror, the image distance will be:

(A) 60 cm

(B) 30 cm

(C) 12 cm

(D) 24 cm

Correct Answer: (A) 60 cm

Solution:

Step 1: Use mirror formula.

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

Given:

$$f = -20 \text{ cm}, \qquad u = -30 \text{ cm}$$

Step 2: Substitute values.

$$\frac{1}{-20} = \frac{1}{v} + \frac{1}{-30}$$

$$\frac{1}{v} = -\frac{1}{20} + \frac{1}{30}$$

$$\frac{1}{v} = \frac{-3+2}{60} = -\frac{1}{60}$$

Thus:

$$v = -60 \text{ cm}$$

Magnitude:

$$\boxed{60 \text{ cm}}$$

Quick Tip: Remember sign convention:

$$f < 0, \quad u < 0$$

for concave mirrors.

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7. The magnifying power of a simple microscope increases when:

(A) Focal length increases

(B) Focal length decreases

(C) Aperture decreases

(D) Radius of lens increases

Correct Answer: (B) Focal length decreases

Solution:

Step 1: Recall magnifying power formula.

$$M = 1 + \frac{D}{f}$$

where:

$$D = \text{least distance of distinct vision}$$

Step 2: Analyze relation.

$$M \propto \frac{1}{f}$$

Hence smaller focal length gives larger magnifying power.

Therefore:

$$\boxed{\text{Focal length decreases}}$$

Quick Tip: Remember:

$$\text{Smaller focal length} \Rightarrow \text{Greater magnification}$$

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8. Match the following quantities with their SI units.

Column I		**Column II**	
(A)	Magnetic flux	(I)	Tesla
(B)	Magnetic field	(II)	Weber
(C)	Capacitance	(III)	Farad
(D)	Resistance	(IV)	Ohm

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-III, B-II, C-I, D-IV

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

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

Solution:

$$\text{Magnetic flux} \rightarrow \text{Weber}$$

$$\text{Magnetic field} \rightarrow \text{Tesla}$$

$$\text{Capacitance} \rightarrow \text{Farad}$$

$$\text{Resistance} \rightarrow \text{Ohm}$$

Thus:

$$\boxed{A-II,\ B-I,\ C-III,\ D-IV}$$

Quick Tip: Remember:

$$1 \text{ Tesla} = \frac{\text{Weber}}{\text{m}^2}$$

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9. A photon has energy 6 eV. Its frequency is approximately:

(A) 1.45×10^{15} Hz

(B) 6×10^{15} Hz

(C) 9×10^{14} Hz

(D) 3×10^{8} Hz

Correct Answer: (A) 1.45×10^{15} Hz

Solution:

Step 1: Use photon energy relation.

$$E = hf$$

Given:

$$E = 6 \text{ eV}$$

$$1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$$

Thus:

$$E = 9.6 \times 10^{-19} \text{ J}$$

Step 2: Calculate frequency.

$$f = \frac{E}{h}$$

$$f = \frac{9.6 \times 10^{-19}}{6.63 \times 10^{-34}}$$

$$f \approx 1.45 \times 10^{15} \text{ Hz}$$

Therefore:

$$\boxed{1.45 \times 10^{15} \text{ Hz}}$$

Quick Tip: Remember:

$$1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$$

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10. Assertion-Reason Type Question

Assertion (A): In photoelectric effect, stopping potential depends upon frequency of incident radiation.

Reason (R): Maximum kinetic energy of emitted electrons increases with frequency.

Choose the correct answer from the options given below:

(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(B) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(C) Assertion is true but Reason is false.

(D) Assertion is false but Reason is true.

Correct Answer: (A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Solution:

Step 1: Recall Einstein photoelectric equation.

$$K_{\text{max}} = hf - \phi$$

Thus:

$$K_{\text{max}} \propto f$$

Step 2: Relation with stopping potential.

$$eV_0 = K_{max}$$

Hence:

$$V_0 \propto f$$

Thus stopping potential depends on frequency.

Both Assertion and Reason are true and Reason correctly explains Assertion.

Therefore:

Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Quick Tip: Remember:

$$V_0 = \frac{hf - \phi}{e}$$

Stopping potential increases with frequency.
