



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.

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
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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
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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
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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.
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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
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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
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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
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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
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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.
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