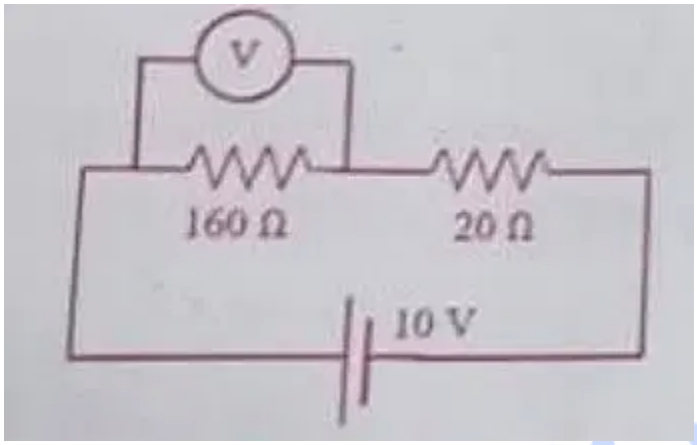
WBJEE 2023 Sample Questions

Q1- In an experiment on a circuit, as shown in the figure, the voltmeter shows 8V reading. The resistance of the voltmeter is



A. 20Ω
B. 320Ω
C. 160Ω
D. 1.44kΩ

Q2- A uniform magnetic field b exists in a region. An electron of charge q and mass m moving with velocity v enters the region in a direction perpendicular to the magnetic field. Considering Bohr angular momentum quantization, which of the following statement(s) is/are true?

A The radius of n^m orbit $r_n \propto \sqrt{n}$

B The minimum velocity of the electron is $\sqrt{\frac{qB\hbar}{m}}$

C The energy of the nth level $E_n \propto n$

D Transition frequency ω between two successive levels is independent of n.

Q2- An electric dipole of dipole moment p is placed at the origin of the coordinate system along the z-axis. The amount of work required to move a charge 'q' from the point (a,0,0) to the point (0,0,a) is

A $\frac{pq}{4\pi\epsilon 0 a}$

B 0

C $-\frac{pq}{4\pi\epsilon 0 a^2}$

D $\frac{pq}{4\pi\epsilon 0 a^2}$

Answer: Option D

Q3- A balloon starting from rest ascends from the ground with a uniform acceleration of 4 ft/sec2. At the end of 5 sec, a stone is dropped from it. If t be the time to reach the stone to the ground and H is the height of the balloon when the stone goes to the floor, Then

A T=6 sec

B H=112.5 ft.

C T=$\frac{5}{2}$ sec

D 225 ft.

Q4- A uniform magnetic field b exists in a region. An electron of charge q and mass m moving with velocity v enters the region in a direction perpendicular to the magnetic field. Considering Bohr angular momentum quantization, which of the following statement(s) is/are true?

A The radius of n^m orbit $r_n \propto \sqrt{n}$

B The minimum velocity of the electron is $\sqrt{\frac{qB\hbar}{m}}$

C The energy of the nth level $E_n \propto n$

D Transition frequency ω between two successive levels is independent of n.

Q5- The B-H curve for a ferromagnet is shown in the figure. The ferromagnet is placed inside a long solenoid with 1000 turns/cm. The current that should be passed in the solenoid to demagnetise the ferromagnet completely is :

A $1mA$

B $2mA$

C $20\mu A$

D $40\mu A$