12.5/30

The University of Jordan
School of Science
Department of Physics

General Physics-2 (0302102)
Second Exam, 18/4/2017
4:00-5:00 pm

Name (in Arabic):- ---- **No.:** · ----- **Section:** ------ **Instructor:** -

**** Solve the following questions and choose the one best answer. Fill in your answers in the Answer Table.**

1	2	3	4	5	6	7	8	9	10	11	12
E	B	A	A	D	E	C	A	C	E	C	D

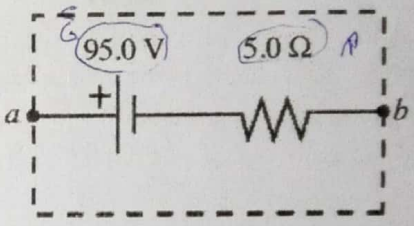
5

Useful Constants: $k_e = 9\times10^9$ N.m^2/C^2, $m_e = 9.11\times10^{-31}$ kg, $e = 1.6\times10^{-19}$ C, $\mu_0 = 4\pi\times10^{-7}$ T.m/A, $1eV = 1.6\times10^{-19}$ J

1. An electric device delivers a current of 5.0 A to a circuit. How many electrons flow through this circuit in 5 s?

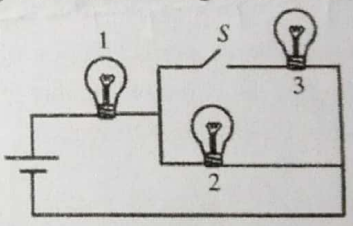
A) 30 B) 50 C) 25 D) 3.1×10^{20} E) 1.6×10^{20}

2. The emf and the internal resistance of a battery are as shown in the figure. If a current of 3.8 A is drawn from the battery when a resistor R is connected across the terminals ab of the battery, what is the power dissipated by the internal resistor (i.e the 5Ω)?



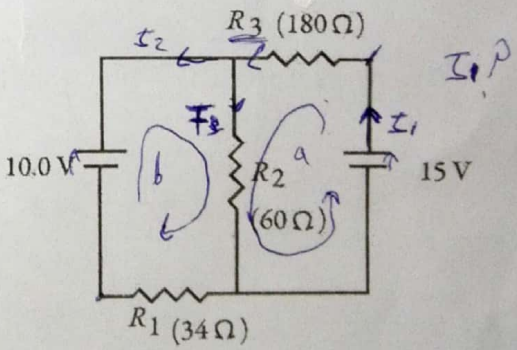
A) 72 W B) 361 W C) 62 W
D) 530 W E) 289 W

3. The figure shows three identical light bulbs connected to a battery having a constant voltage across its terminals. When the switch S is closed, the brightness of light bulb 1 will:



A) remain the same as before the switch is closed.
B) decrease.
C) increase.

4. For the circuit shown in the figure, what is the current through resistor R_3?



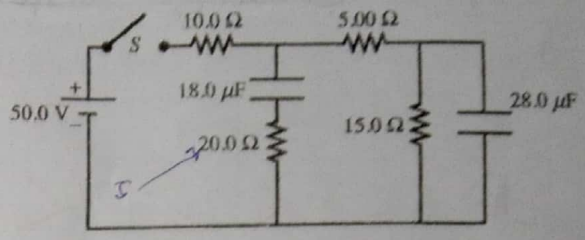
A) 0.043 A
B) 1.5 A
C) 0.028 A
D) 0.068 A
E) 0.086 A

5. What is the kinetic energy (in eV) of an electron that passes undeviated through perpendicular electric and magnetic fields if $E = 2.0$ kV/m and $B = 8.0$ mT?

A) 0.71 eV B) 0.18 eV C) 0.32 eV D) 0.54 eV E) 1.4 eV

6. For the circuit shown in the figure, the capacitors are all initially uncharged, the connecting leads have no resistance, the battery has no appreciable internal resistance, and the switch S is originally open. After the switch S has been closed for a very long time, what is the current in the 20.0-Ω resistor?

A) Zero
B) 1.67 A
C) 2.50 A
D) 3.33 A
E) 5.00 A



7. An electron moving with velocity v to the left enters a region of uniform magnetic field that points out of the paper. After the electron enters this region, it will be:

A) deflected out of the plane of the paper.
B) deflected into the plane of the paper.
C) deflected upward.
D) deflected downward.
E) undeflected in its motion.

8. A circular coil of wire of 200 turns and diameter 2.0 cm carries a current of 4.0 A. It is placed in a magnetic field of 0.35 T, with the plane of the coil making an angle of 30° with the magnetic field. What is magnitude of the magnetic torque on the coil?

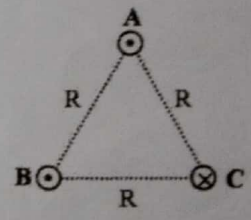
A) 0.15 N.m
B) 0.076 N.m
C) 0.29 N.m
D) 0.044 N.m
E) 0.088 N.m

9. When the number of turns in a solenoid and its length are both doubled, the ratio of the magnitude of the new magnetic field inside to the magnitude of the original magnetic field inside is:

A) 0.25
B) 0.50
C) 1
D) 2
E) 4

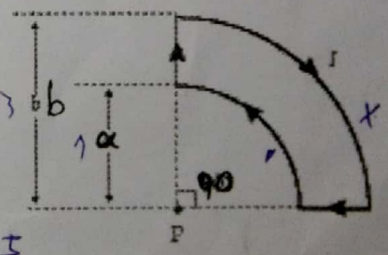
10. The figure shows a cross section of three parallel wires each carrying a current of 20 A. The currents in wires A and B are out of the paper, while that in wire C is into the paper. If the distance R = 5.0 mm, what is the magnitude of the force on a 1.0-m length of wire A?

A) 23 mN
B) 32 mN
C) 16 mN
D) 64 mN
E) 55 mN



11. If a = 1.0 cm, b = 3.0 cm, and I = 10 A, what is the magnitude of the magnetic field at point P?

A) 0.62 mT
B) 0.59 mT
C) 0.35 mT
D) 0.31 mT
E) 0.10 mT



12. A long cylindrical wire (radius = 2.0 cm) carries a current of 20 A that is uniformly distributed over a cross section of the wire. What is the magnitude of the magnetic field at a point which is 1.5 cm from the axis of the wire?

A) 0.53 mT
B) 28 mT
C) 0.30 mT
D) 0.15 mT
E) 1.9 mT

**** ALL THE BEST ****