

Department of Computer Science and Engineering
Faculty of Science and Information Technology (FSIT)
Final Examination Semester: Fall – 2017 Sections: All
Course Title – Electricity, Magnetism and Modern Physics
Course Code – PHY 123 Course Teacher's Initial: All

Time – 2 Hours

Marks – 40

Part I

Answer the questions

5 × 3 = 15

1. For an LR series circuit, the current wave lags behind the applied emf in phase by an angle θ . Explain this statement mathematically.
2. Explain photoelectric effect. Establish the Einstein's photoelectric equation.
3. Show that, $B = \frac{\mu_0 n i}{2r}$. Where the symbols have their usual meaning.

Part II

Answer any Five (5) questions

5 × 4 = 20

1. Suppose, you have a conducting circular wire and its number of turns is 325. Current of 5A is flowing through the wire and it is creating a magnetic field of 1.5 T at the center of the coil. Find the radius of the circular wire.
2. If an electron is accelerated from rest through a potential difference of 1125 V. Find the final velocity of the electron.
3. When radiation of frequency of 2.5×10^{-12} Hz is incident on a metal surface, electron of maximum energy of 5.6×10^{-15} J is emitted. What is the threshold frequency of that metal?
4. A piece of radium is transformed by radioactive emission to $\frac{1}{7}$ th of its initial mass in 3500 years. Calculate the decay constant of radium.
5. Express the equivalent energy of 19 amu mass in (i) KeV (ii) MeV.
6. If the total energy of a moving particle is 8.5 times the stationary energy, what is the speed of the particle?

Part III

Answer all the questions given below

3 × 1 = 3

1. An alpha particle really is a nucleus - it's the same as the nucleus of a common atom of helium - but it doesn't have any electrons around it.

(a) True (b) False

2. In photoelectric effect, electrons should be removed from the

(a) Surface (b) Inner shells

Q3. According to Biot-Savart law, which parameter exhibits, the inverse relationship to the differential magnetic field?

- (a) Current
- (b) Magnitude of differential length
- (c) Sine of angle between filament and line connecting differential length to point
- (d) Square of the distance from differential element to point

Part IV

2

X. Draw the time dependent graph of alternating current and direct current.