Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Final Exam Examination, Summer 2021 @ DIU Blended Learning Center

Course Code: Phy113, Course Title: Physics-I

Level: 1 Term: 1 Section: All

Instructor: MMI Modality: Open Book Exam

Date: Monday 6 September, 2021 Time: 09:00am-12:30am

Three and half hours (3:30), Marks: 40

Answer any(5) from the following questions: **2+2+4**

1.a) What is always released when an electron drops down an energy level?

b) Discuss the similarities and differences between the electrical force on a charge and the magnetic force on a charge.

c) Calculate the binding energy of an alpha particle in MeV. Given mass of a proton=1.00758 a.m.u., mass of neutron=1.00897 a.m.u. and mass of helium nucleus=4.0028 a.m.u

2. a) The earth has a magnetic field, that's why a compass points North. According to theory, why does this field exist?

b) What is the photoelectric effect and why is it important?

c) A galvanometer of resistance of 150 ohm can safely pass 10m A current.What arrangement is to be made so th at 13A current can be measured by it?

3. a) why resistance becomes more in series combination?

b) What is the cause of resistance of a conductor?

c) A 450pm violet light is incident on a calcium photoelectrode with a work function of 2.81 eV. Find the energy of the incident photons and the maximum kinetic energy of ejected electrons.

4. a) Explain why the photoelectric effect cannot be explained by classical physics

b) Define and make clear distinctions between the terms neutron, nucleon, nucleus, and nuclide.

c) A piece of radium becomes one-seventh part on radiating radioactive radiation for 5590 years.Find the decay constant of radium.

5. a) How could you determine which pole of an electromagnet is north and which pole is south?

b) What is the problem with Bohr's model of the atom?

c) A metal surface is exposed to light of wavelength of 5790 A_0 . 1.47 eV is required to remove an electron. What is the kinetic energy of the fastest electron? What is the threshold frequency? ($h = 6.63 \times 10^{-34}$ Js and $1eV = 1.6 \times 10^{-19}$ J)

6.a) Discuss any similarities and differences between the photoelectric and the Compton effects.

b) If a wire is stretched to doubled it's original length without loss of mass, how will the resistivity of the wire be influenced?

c)In each corner of a square of side is 3m. $5*10^{-7}$ C charge is given.Calculate the potential at the centre of the square.