Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Final Examination, Summer 2021 @ DIU Blended Learning Center

Course Code: Phy123 (Evening), Course Title: Physics-II

Level: 1 Term: 1 Section: All

Instructor: MMI Modality: Open Book Exam

Date: Monday 6th September, 2021 Time: 07:00am-10:30am

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

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

1. a) Describe how Einstein's idea of a particle of radiation explains the photoelectric effect.

b) Do houses use DC or AC?Explain.

c) Calculate the avg. mean value of an alternating current for the second negative half cycle.

2. a) Should an atomic bomb really be called nuclear bomb?

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

c) Calculate the mass defect and binding energy of $_{11}Na^{23}$. Mass of each neutron =1.008665 a.m.u. , Mass of each proton= 1.007277 a.m.u., Mass of sodium nucleus=7.016005 a.m.u..

3. a) Which aspects of the photoelectric effect cannot be explained without photons?

b) Why does the fusion of light nuclei into heavier nuclei release energy?

c) A 530pm violet light is incident on a calcium photoelectrode with a work function of 3.81 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) Why is radon more closely associated with inducing lung cancer than other types of cancer?

c) A piece of radium becomes one-eighth part on radiating radioactive radiation for 5430 years.Find the decay constant of radium.

5. a) Explain the Process of Photoelectric Emission.

b) Will a transformer work if the input is a dc voltage?

c)An alternating current is expressed as $i=21\sin \pi t$.Calculate frequency, peak value,and root mean square value of the current.

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

b) Why is a conventional fission nuclear reactor not able to explode as a bomb?

c)The work function of sodium is 9.41 eV.Calculate the maximum kinetic energy when light wavelength of 4300 A is incident on it.