

Daffodil International University Faculty of Science & Information Technology Final Examination, Summer 2021 @ DIU Blended Learning Center Course Code: Phy101 (Evening), Course Title: Physics-I, Dept. :EEE Level: 1 Term: 1 Section: A Instructor: MMI Modality: Open Book Exam Date: Wednesday 1<sup>st</sup> Sep, 2021 Time: 07:00pm-10:30pm Three and half hours (3:30), Marks: 30

## Answer any(5) from the following questions:

1.5+1.5+3

**1.**a) What is called that instrument which can convert A.C voltage of high value to the low value of low value to a high value?

b) State one advantage of using an ac over the dc?

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

2. a)What is the problem with Bohr's model of the atom?

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

c) Calculate the mass defect and binding energy of 3 Li 7 . Mass of each neutron =1.008665 a.m.u. , Mass of each proton= 1.007277 a.m.u., Mass of lithium nucleus=7.016005 a.m.u.

3. a)What is the key difference and the key similarity between beta ( $\beta$ -) decay and alpha decay?

b) What is the function of a moderator in a nuclear reactor?

c) A 430nm violet light is incident on a calcium photoelectrode with a work function of 2.71 eV. Find the energy of the incident photons and the maximum kinetic energy of ejected electrons.

4. a)Why does a chain reaction occur during a fission reaction?

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 4500 years.Find the decay constant of radium.

5. a)Discuss the differences between average power and instantaneous power.

b) What is true of any AC circuit?

(i) None of these

(ii) The power dissipation happens in resistance only in AC circuit

(iii) The algebraic sum of the rms voltage across the different element of the circuit is equal to the applied rms voltage

(iv) The algebraic sum of the instantaneous voltage across the different element of the circuit is equal to the applied instantaneous voltage

c)An alternating current is expressed as i=10sin  $\pi$ 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)What is the difference between  $\gamma$  rays and characteristic X-rays and visible light?

c)The work function of sodium is 2.3eV.Calculate the maximum kinetic energy when light wavelength of 2000 A is incident on it.