COMSATS University Islamabad, Lahore Campus

Department of Physics

Mid Term Exam-Spring 2022

Course Title:	Electricity Magnetism and Optics			Course	PHY120	Credit	3(3,0)
Course Instructor/s:	Dr. Naima Amin			Programme	BS-Computer Science		
Semester:	2nd	Batch:	FA21 - BCS	Section:	[redacted]	Date:	13-05-2022
Time Allowed:	90 minutes			Maximum Marks:		25	
Student's Name:	[redacted]			Reg. No.	[redacted]		

Important Instructions / Guidelines:

- Attempt all questions
- Do not use correction fluid.

Question1 **[4+3]**

a. Find the potential difference between any two points in an electric field is given by the integral of the electric field taken over any path joining those points.

b. A positive charge of $q_1 = 2x10^{-7}$ c is placed at a distance of 0.15m from another positive charge $q_2 = 8x10^{-7}$ c. At what point on the line joining them is the electric field is zero?

Question 2 **[7+3]**

a. A parallel plate capacitor, each with plate area A and separation d, is charged to a potential difference V. The battery is used to charge it is then disconnected. Calculate the change if any take place. (a)Electric field between plates (b) Potential difference between plates (c) If a dielectric slab of thickness d and dielectric constant is now placed between plates, the capacitance of capacitor so formed (d) determines the energy stored in a parallel plate capacitor.

b. The capacitor of a parallel plates capacitor is $400x10^{-9}$ farad and its plates are separated by 2 mm air. (a) What will be the energy when it is charged to 1500 volts? (b) What will be the potential difference with same charge if plate separation is doubled? (c) How much energy is needed to double the distance between its plates?

Sallrej
11/05/22

Question 3 **[5+3]**

a. An electric dipole is held in a uniform electric field. Using a suitable diagram describe the electric field due to a dipole existing at a general position.

b. A dipole is consisting of an electron and proton, 4×10^{-10} m apart. Compute the electric field at a distance of 2×10^{-8} m on a line making an angle of 45^0 with the dipole axis from the center of the dipole.

Samrat
11/05/22