

Daffodil International University

**Faculty of Science & Information Technology**

**Midterm Exam Examination, Summer 2021 @ DIU Blended Learning Center**

**Course Code: Phy101 (Evening), Course Title: Physics-I**

**Level: 1 Term: 1 Section: A**

**Instructor: MMI Modality: Open Book Exam**

**Date: Wednesday 14 July, 2021 Time: 06:00pm-8:30pm**

**Two and half hours (2:30), Marks: 25**

**SET-A**

**Answer to the following questions (10\*1=10):**

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

ii) Why isn’t a bird sitting on a high-voltage power line electrocuted?

iii) Why resistance becomes more in series combination.?

iv) If the temperature of a good conductor increases, how does the relaxation time of electrons in the conductor change?

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

vi) How could you determine which pole of an electromagnet is north and which pole is south?

vii) electricity has positive and negative charges. What does a magnet have and how are they similar/different than electric charges?

viii) If you break a magnet in half, what happens?

ix) If you wish to store a large amount of charge in a capacitor bank, would you connect capacitors in series or in parallel? Explain.

x) What do you understand by 5v?

**SET-B**

**Answer to the following mathematical problems (5\*2=10)**

1. When two equally charged pith balls are kept 2.0mm apart they repeal each other with a force of 4.5\*10 -5 Find the charge on each ball.
2. A plastic ball with a charge of 3.23\*10 -19 C is placed in hanging position in a uniform electric field of intensity 2.6\*10 4 vm-1. If the magnitude of the acceleration due to gravity at that place is 10 ms-2, what is the mass of the plastic ball?
3. The diameter of a circular coil of 40 turns is 32cm. To create a magnetic field of 100 μT at the center of the coil how much current is to be flown through the coil?
4. Connecting a shunt of 5 Ω with a galvanometer of resistance of 100 Ω is connected in an electric circuit. 0.42A current is obtained through the galvanometer. What is the main current in the circuit?
5. Fin the length of a wire of 1mm diameter and 44\* 10 -8 Ωm specific resistance.

**SET-C**

**Answer to following MCQ & Fill in the gaps (5\*1=1):**

1. A capacitor is an electrical device constructed of two parallel plates separated by an insulating material called a …………………….

ii)A body is positively charged, it implies that

a) there is positive as well as negative charge in the body but the positive charge is more than negative charge

b) there is only positive charge in the body

c)there is equal positive and negative charge in the body but the positive charge lies in the outer regions

d)negative charge is displaced from its position

**iii)Which is the equation of the magnetic field according to Biot-Savart’s law?**

**a)** IdIsinθ/r2  b) (μ0/4π)IdIsinθ/r c) (μ0/4π)IdIsinθ/r2 d) (μ0/4π)IdIsinθ

iv)SI unit of electric potential is \_\_\_

|  |
| --- |
| v) If the voltage across a resistor \_\_\_, the current flowing through it will increase. |
| |  |  | | --- | --- | |  | a)increases b)decreases c)stays the same d) none of the above | |