

Shahjalal University of Science and Technology, Sylhet
 Department of Physics
 2nd Year 1st Semester Examination-2012
 Course: PHY 205B, Course Title: Physics for Biologists-I
 Credits: 2, Total Marks: 60, Time: 2.00 hours

Answer any four questions from the following

1. State Coulomb and electric field.

2. Using Coulomb's law, find an expression for the electric field strength E for a point on the axis of a ring of charge q and radius a at a distance x from its center. Hence show that at great enough distances the ring behaves like a point charge.

3. State and explain Gauss's law.

4. Using Gauss's law find the electric field due to a long charged cylinder.

5. Calculate the electric flux due to a point charge 5×10^{-7} coul at the center of a spherical surface of radius 0.2 m.

6. How can a uniform electric field be produced?

7. Define a dielectric. Find an expression for the Gauss's law in the presence of a dielectric.

8. Establish a relation among the three electric vectors.

9. Compare electric and magnetic force.

10. Define Lorentz relation and state Ampere's law.

11. What is a solenoid? Show that a constant magnetic field can be produced by the solenoid.

12. Describe the nature of light.

13. What are coherent sources? How are they realized in practice?

14. Find an expression for the intensity due to coherent sources. And also describe under what conditions the intensity becomes maximum and minimum.

15. Discuss the diffraction of light by a narrow slit.

16. Explain the formation of spectra by a plane diffraction grating.

17. A plane grating has 15000 lines per inch. Find the angle of separation of the 5048 Å and 5016 Å lines of helium in the second order spectrum.

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