

Exam.Code:0039
Sub. Code: 17995

2125
B.Sc. (Hons.) Bio-Informatics
First Semester
BIN-1008: Physics

Time allowed: 3 Hours

Max. Marks: 60

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Short Questions:

- a) What are the limitations of dimensional analysis?
- b) What is the significance of quantum theory of light?
- c) What is electric flux?
- d) Explain Brewster angle of polarization by reflections.
- e) What is the principle of superposition?
- f) Define half-life of a radioactive substance. (6x2)

UNIT - I

- II. (a) What do you mean by physical quantities? Write the dimensional formula for current and current density.
(b) Derive the expression for the energy stored in capacitor. (4,8)
- III. (a) Use Gauss theorem to calculate field due to a line charge.
(b) State and explain Ohm's law. Derive an expression for ohm's law in vector form. (2x6)
- IV. (a) Derive equation of continuity.
(b) Explain capacitance in series and parallel arrangements. (2x6)

UNIT - II

- V. (a) Show that the fringe width is given by $\beta = D\lambda/d$, where the symbols have their usual meanings.
(b) In a particular two-slit interference pattern with $\lambda = 6000\text{\AA}$ the zero-order and 10th order maxima fall at micrometer reading 12.34 mm and 14.73 mm. If λ is changed to 5000 \AA deduce the positions of the zero-order and 20th order fringes, other arrangements remains the same. (2x6)

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(2)

- VI. (a) Explain principle and construction of a compound microscope.
(b) What is Uncertainty principle? Explain how it is the outcome of the wave description of a particle. (2x6)
- VII. (a) 10 milligram of a radioactive material of half-life period two years is kept in store for four years. How much of the material remains unchanged?
(b) Write short note on: Resolving power and magnifying power of a microscope. (2x6)

x-x-x