Exam.Code:0039
Sub. Code: 17995

2124

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. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Answer the following:-
(a) Name and define the radioactive units.
(b) Explain compound microscope.
(c) What is luminosity?
(d) How many square centimeters are in an area of 6.0 km^2 ?
(e) State the principle of superposition.
(f) Define mean-life of a radioactive substance.

(6x2)

Unit-I

II. (a) The research submersible SAGAR SAMPADA is diving at a speed of 36.5 fathoms per minute. What is this speed in light years per year? (fathom = 6 feet) (4)
(b) Derive the expression for the energy stored in capacitor. (8)

III. (a) State and define electric field due to electric dipole. Derive the expression for the electric potential due to an electric dipole. (6)
(b) What would the charge on each sphere be if the force was attractive? (6)

IV. (a) Derive equation of continuity. (6)
(b) State and explain Ohm's law. Derive an expression for ohm's law in vector form. Using Ohm's law derive the relation.

$$J=\sigma E$$ (6)

Unit-II

V. (a) Show that the fringe width is given by $\beta=D\lambda/d$, where the symbols have their usual meanings. (6)
(b) A double slit of separation 0.5 mm in illuminated by light of the blue cadmium line. How far behind the slit must one go to obtain fringes that are 1 mm apart? (6)

P.T.O.

VI. (a) Write short note on: Polarization and magnifying power of a microscope. (6)

(b) What is Uncertainty principle? Explain how it is the outcome of the wave description of a particle. (6)

VII. (a) The half life of $_{11}Na^{22}$ is 15 hrs. How long it take for 93.75% of a sample of this isotope to decay? (6)

(b) A zone plate is made by arranging the radii of the circles which define the zones such that they are the same as the radii of Newton's rings formed between a plane surface and the surface having radius of curvature 200 cm. Find the principal focal length of the zone plate. (6)

x-x-x