Roll No. .....

41258

B. Sc. (Hons.) Maths 4th Semester Examination – May, 2019

PHYSICS -IV

Paper : BHM246 Opt - ii

Time : Three hours] *[Maximum Marks : 60*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting at least ***one*** question from each Unit. Question No. **1** is ***compulsory***.

1. (a) Write the purpose of Do statement.

(b) Two dice are thrown simultaneously. What will be probability that either a number 2 or 4 on the upper faces of dice.

(c) Define static and dynamic system.

(d) Compare the photoelectric effect and compton effect.

(e) If an electron has a wavelength, does its also have a colour. 2 × 5 = 10

UNIT – I

2. (a) What is a flow chart ? Write the rules of drawing flow chart. Give the advantage of flow chart. 6

(b) Distinguish between executable and non-executable statements. 4

3. (a) Explain GOTO statement along with its types. 6

(b) Write a subprogram to calculate the area of a triangles. 4

UNIT – II

4. (a) Derive Boltzmann distribution law and derive expression for values of A and B. 7

(b) Find the probability that in tossing a coin 12 times, we get (i) 3 heads 9 tails (ii) 6 heads 6 tails. 3

5. (a) Derive Planck's law of radiation using B- E distribution. 7

   (b) Define macrostate and microstate with examples. 3

UNIT – III

6. (a) What do you understand by wave particle dualism ? Describe Davisson and Germer's experiment to illustrate the wave nature of matter. 7

   (b) An electron has a speed 1.05×10^4 m/s within the accuracy of 0.02%. Calculate the uncertainty in the position of the electron. 3

7. (a) Define group velocity, phase velocity and particle velocity. Derive a relation between group velocity and particle velocity for a relativistic particle. 7

   (b) The work function of a metal is 3.5eV. Calculate , what should be the maximum wave length of a photon that can eject photo- electrons from the metal. 3

   (a) Derive the time dependent Schrödinger wave equation. 8

   (b) Write two limitations of old quantum theory. 2
