Registration No : | | | | | | | | | | |

Total Number of Pages : 01 **B.Tech**

BS1102

2nd Semester Back Examination 2018-19
PHYSICS-I
BRANCH : AEIE, CIVIL, CSE, ECE, EEE, ELECTRICAL, ETC, IT, MECH
Time : 3 Hours
Max Marks : 70
Q.CODE : F082

Answer Question No.1 which is compulsory and any FIVE from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions :** **(2 x 10)**

a) Define time period, frequency and amplitude of an oscillator.
b) What is the principle of superposition?
c) State the relation between path difference and phase difference.
d) Write down difference between Fresnel and Fraunhoffer diffraction.
e) What is a quarter wave plate?
f) Evaluate curl of a position vector.
g) State Maxwell's equations in a medium having no charge and no current.
h) State Heisenberg's Uncertainty Principle?
i) What is Photoelectric effect?
j) X-Rays of wave length 1Å undergoes Compton scattering through 90^0. Find the Compton Shift.

Q2 **a)** Establish the differential equation of a damped harmonic oscillator subject to damping force proportional to velocity. **(5)**
b) Define coupled Oscillation. Formulate the differential equation for the coupled Oscillation and establish the normal mode equations. **(5)**

Q3 **a)** Derive the expression for fringe width in Bi-prism arrangement. **(5)**
b) Mention the similarities and difference between a converging lens and a zone plate. **(5)**

Q4 **a)** What are Fresnel's half period zones? Explain the factors on which the intensity at a point due to Fresnel's half period zones depend? **(5)**
b) Discuss the Fraunhofer diffraction due to a single slit. Find condition of Principal maximum and minimum. **(5)**

Q5 **a)** What in meant by polarization of light. How polarization is produced by reflection. State Brewster's law. **(5)**
b) With neat diagram, explain the construction and working of a Nicol Prism. **(5)**

Q6 Write the integral form of the Ampere's circuital law.Obtain the differential form of the Ampere's circuital law. Write down the distinction between current and current density. **(10)**

Q7 Derive the time independent and time dependent Schrodinger's equation for 3-dimensional system and hence find out the energy of a free particle? **(10)**

Q8 **Write short answer on any TWO :** **(5 x 2)**

a) Newton's Ring
b) Zone plate
c) Poynting theorem