B. Sc. (Sem. II) (CBCS) Examination
March / April - 2017
Physics : Paper - 201
(Old Course)

Faculty Code : 003
Subject Code : 001202

Time : $2\frac{1}{2}$ Hours]   [Total Marks : **70**

Instructions : (1) All questions are compulsory.

(2) Symbols have their usual meaning.

(3) Right side indicates marks.

1 Write short answer of following : (Each 1 Mark)   **20**

(1) Write Newton's formula for the velocity of sound in air.

(2) Write formula for the fundamental frequency of transverse wave in string.

(3) Give an equation of the power of dispersion of a prism.

(4) Write the formula for the fringe width β.

(5) Write the names of filter circuits.

(6) Write the formula for capacitor reactance.

(7) The Zener diode operated in voltage regulator circuit as _____ bias.

(8) LED is device which converts electrical energy into .....

(9) Photo diode, operated in the circuit as _____ bias.

(10) Write collector current equation of transistor in CE connection.

(11) Write the relation between α and β of transistor parameters.

(12) A point on dc load line gives the possible values of.....

(13) For (1 1 0) plane, the intercepts on X,Y and Z axis.

(14) Which axis are parallel for (0 1 0) plane ?

(15) Write the formula for minimum wavelength λ_{min} of X-rays.

(16) Which spectrum line generated due to transition of electron from $L \to K$?

(17) If reflection order increases, the intensity of reflected X-ray......

(18) Operating point "Q" represents the value of.....

(19) Write the relation between the half life period and average life period.

(20) In beta decay process, any changes in mass number of nuclei.

2   (a)   Define the following : (Answer any three)   6

   (1)   Transverse and Longitudinal wave motion.

   (2)   Fermat's Principle.

   (3)   Ripple factor-γ

   (4)   Optoisolator

   (5)   Filter circuits

   (6)   Types of interference.

   (b)   Explain the following : (Any **three**)   9

   (1)   Derive the differential equation of a wave motion.

   (2)   Write the conditions for interference of light.

   (3)   Give the construction and working of half wave rectifier.

   (4)   Describe the multicolor LED.

   (5)   Explain the capacitor filter.

   (6)   Describe in brief, interference in Thin Film.

(c) Write answer on any two : 10

(1) Derive Newton's formula for velocity of sound in air and apply Laplace's correction.

(2) Describe the Newton's rings and its formation.

(3) Explain the use of a Zener diode as voltage regulator.

(4) Describe the principle, construction and working of a photodiode.

(5) Describe Melde's experiment.

3 (a) Define the following : (Answer any three) 6

(1) Operating point of transistor

(2) PNP and NPN transistors

(3) Primitive cell

(4) Continuous x-rays spectrum

(5) Radioactive decay constant

(6) Natural and artificial radioactivity.

(b) Explain the following : (Answer any three) 9

(1) Describe the transistor load line analysis

(2) Explain the Miller indices

(3) Write a short note on Coolidge tube

(4) Describe the Ionization chamber

(5) Explain the properties of β -rays

(6) Explain the law of radioactive disintegration.

(c) Write answer on any two : **10**

    (1) Describe in detail, common emitter connection of transistor.

    (2) Describe the crystal structure of sodium chloride (NaCl)

    (3) State and prove Bragg's law.

    (4) Derive an equation of the average life time of radioactive substance.

    (5) Describe the Bragg x-ray spectrometer.

———