DI-003-001202 Seat No. _____

B. Sc. (Sem. II) (CBCS) Examination

March – 2022

Physics : Paper-201

(Wave, Optics, Electronic, Cristal-X-ray, Radioactivity)

(Old Course)

Faculty Code : 003

Subject Code : 001202

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

Instructions :

(1) All questions are compulsory.

(2) Symbol have their usual meaning.

(3) Right side indicates marks.

1 Write a short answer to the following : **20**

(1) The speed of sound in a perfectly rigid rod is _____.

(2) Sound wave are _____.

(3) When a sound wave changes a medium frequency quantity remain unchanged. True or False

(4) The unit of dispessive power is degree. True or False

(5) The wave are said to be coherent if they have a same amplitude. True or False

(6) The capacitive reactance for dc is _____.

(7) Regulation for the half wave rectifier is very poor. True or False

(8) A zenes diode is _____ device.

(9) LEDs are made from gallium. True or False

(10) Photo diode converts _____.

(11) In most transistors, the base region is physically the largest. True or False

(12) A transistor is a current controlled device. True or False

(13) The value of β for transistor is generally less than 1. True or False.

(14) How many lattice point in bcc lattice ?

(15) How many the co-ordinate number of face-centred crystal ?

(16) The shortest wave length of X-rays emitted from X-ray tube depends on the current in the tube. True or False

(17) X-rays travel with velocity of super sonic waves. True or False

(18) What is the equation for Bragg's law ?

(19) The radio active distintegration is exponential in nature. True or False

(20) What is nature radioactive ?

2 (A) Answer any **three** questions : **6**

(1) State the law of vibrating string.

(2) Define the effect of temperature of velocity of sound.

(3) Calculate dispessive power of prism.

(4) What is Ripple ?

(5) What is filter circuit ?

(6) What is LED ?

(B) Answer any **three** questions : **9**

(1) Derive an equation of velocity of sound as per Lapace's correction.

(2) Give the condition for interference of light.

(3) Derive law of reflection by Format's principle.

(4) Explain construction and working of full wave bridge rectifier.

(5) How does photo diode work ?

(6) Give advantages of LEDs.

(C) Answer any **two** questions : **10**

(1) Describe Merde's's experiment.

(2) Describe an equation of velocity of transverse wave on stretched string.

(3) Derive Newton's rings and its formation.

(4) Explain the use of zener diodes as voltage regulators.

(5) Explain the principle construction and working of a photo diode.

3 (A) Answer any **three** questions : **6**

(1) Show that $\beta = \frac{\alpha}{1-\alpha}$ in CE connection.

(2) How transistor is operated ?

(3) Define primitive cell.

(4) Write any two properties of X-rays.

(5) What are the uses of Laue's pattern ?

(6) What is the natural radioactivity ?

(B) Answer any **three** questions : **9**

(1) Explain input characteristics of CE connection.

(2) Define lattice, basis and crystal structure.

(3) Write note on NaCl crystal structure.

(4) Write industrial application of X-rays.

(5) Explain crustal structure with the help of Bragg's law.

(6) What is radioactive decay constant ? Explain.

(C) Answer any **two** questions : **10**

(1) Describe i/p and o/p characteristic of connection.

(2) Explain in detail common collector connection.

(3) Describe crystal structure of diamond.

(4) State and prove Bragg's law.

(5) Describe the properties of γ -particles.
