C

Roll No.

CBC-831-T
B.Sc./B.Sc.B.Ed. Fifth Semester
(End semester)
Examination Dec. 2018

PHYSICS

Paper : PHY-SE-511

(Applied Optics)

Time : Three Hours] [Maximum Marks :60

Note :– All questions are compulsory.

SECTION - A

(Objective Type Questions) 1×10=10

Note :– Choose the correct answer.

1. (1) Light amplification by stimulated emission of radiation is known as—

(a) Light amplifier

[P. T. O.

(b) Maser

(c) Laser

(d) None of these

(2) A laser light consist of—

(a) Cosmic rays

(b) Electrons stream

(c) Light material particles

(d) Perfectly coherent photons

(3) Phase contrast microscopy is base on—

(a) Fourier transform

(b) Laplace transform

(c) Confocal Imaging

(d) Doppler Imaging

(4) Low pass filtering removes—

(a) High spatial frequency

(b) Low spatial frequency

(c) Both low and high spatial frequency

(d) None of the above

(5) In Michelson interferometer, if the reflected and transmitted beams are in phase at the beam splitter than intensity reach the detector will be—

(a) Minimum

(b) Maximum

(c) Equal

(d) None of these

(6) Fourier transfer NMR spectrometer has which of the following characteristics—

(a) Increased sensitivity, long time to obtain data

(b) Decreased sensitivity, long time to obtain data

(c) Increased sensitivity, reduced time to obtain data

(d) Decreased sensitivity, reduced time to obtain data

(7) In holography interference pattern is produced from—

(a) Object beam

(b) Reference beam

[P.T.O.

(c) Both (a) and (b)

(d) None of the above

(8) The images of object produced through holography is —

(a) One dimensional

(b) Two dimensional

(c) Three dimensional

(d) None of the above

(9) Optical fiber uses the phenomenon of—

(a) Reflection

(b) Refraction

(c) Interference

(d) Total internal reflection

(10) Source of light for optical fibre is—

(a) PIN diode

(b) Photodiode

(c) LED/ LASER

(d) None of these

Contd. ....

SECTION - B

(Short Answer Type Questions) 4×5=20

Note :– Attempt any **four** questions. Each question carries five marks.

2. Draw a labelled energy level diagram of He-Ne laser Mention the name of active medium, wavelength and type of pumping for He-Ne laser.

3. Write the expression for 2-D fourier transform and explain spatial frequency.

4. Describe Fourier transform spectroscopy and its principle.

5. Write down the types of holograms and explain them.

6. What is optical fiber? Write down its properties.

7. (a) Write down the characteristics of laser beam.

   (b) On the bases of mode write the type of optical fiber and define them.

SECTION - C

(Long Answer Type Questions) 3×10=30

Note :– Attempt any **three** questions. Each question carries ten marks.

8. (a) Define—
   (i) Spontaneous emission
   (ii) Stimulated emission
   (iii) Population inversion
   (iv) Metastable state

   (b) Write a relation between Einstein's coefficient A & B.

9. Describe the fourier transforming property of a thin lens.

10. Draw and explain block diagram of NMR spectrometer. Write the difference between continuous wave NMR and Fourier transform NMR.

11. What is Holography ? Explain the process of holography recording and reconstruction.

12. What is attenuation in optical fiber ? Describe its type.