

May – June 2006

Bachelor of Computer Application (BCA) Examination

II semester

Physics –II

Time 3 Hours]

[Max. Marks 40]

Note : Attempt all five questions. Each question carries equal marks and has internal choice. Objective type questions are compulsory.

1. (a) Explain briefly:
- (i) Drick propagation
 - (ii) Impedance matching
 - (iii) Wave Guide

OR

What is a Transmission Line? Obtain expressions for the reflection coefficient and voltage standing wave ratio.

(b) Answer the following:

- (i) Electromagnetic waves consist of Electric and Magnetic fields oscillating in the same plane. (True/False)
- (ii) Electromagnetic waves do not need any medium for propagation. (Trie/false)

- 2 Explain the construction and working of Michelson's interferometer with the help of suitable diagram.

What is the role of compensating plate?

OR

What are coherent sources and how can these be formed?

Obtain the condition for maxima and minima when two waves of same amplitude and frequencies are superposed.

- 3 (a) Discuss the main features of Fraunhofer and Fresnel Types of Diffraction.
- (b) A plane monochromatic wave ($\lambda=6.0 \times 10^{-5}$ cm) falls normally on a straight slit of width 0.2 mm. Calculate the total linear width as observed on a screen placed 2 metres away from the slit.

OR

unhofer diffraction due to double slit and obtain the relation $(e+d) \sin \theta = n\lambda$ where symbols have their usual meaning.

(b) Plot the Intensity distribution pattern. How it is affected by increasing the slit width?

- 4 What do you understand by Double Refraction?
Discuss briefly Quarter and Half wave plate.

OR

What is optical Activity? Discuss Fresnel's theory of optical rotation.

- 5 (a) Discuss Spontaneous and Stimulated emission and bring about the distinction between the two.
(b) Explain the role of population inversion in the working of a LASER. How it is achieved?

OR

What are industrial and medical applications of a LASER?
Explain the principle and working of a He Ne Laser.

* * *