May 2005

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) What do you mean by Transmission line? Calculate the reflection coefficient and voltage standing wave ratio.

OR

Define and explain briefly: (i) Skip distance (ii) Critical frequency (iii) MUF.

(b) Answer the following :

(i) Electromagnetic wave propagation obeys Maxwell" s Equations. (True/ false)

(ii) Light and Radio waves are electromagnetic wave. (True / False)

2. What is meant by Interference of light ? Derive the conditions of maxima and minima for the production of interference fringes?

OR

Explain how Newton's rings are formed and describe the method for determination of wavelength of light with their use.

3 (a) Explain the action of a zone plate and show that the object and image distance obey the ordinary lens formula.

(b) The diameter of the first ring of a zone plate is 1 mm. If the plane waves of wavelength 5000 A fall on the plate, find where a screen should be placed so that light is focused to the brightest spot.

OR

(a) Discuss the fraunhoffer diffraction at a single Slit. Extend the theory to the case of plane transmission grating.

(b) Monochromatic light of wavelength 6560×10^{-8} M falls normally on a grating 2 cm wide. The first order spectrum is produced at an angle 18^0 14 from the normal. What is the total number of lines on the grating? Given sin 18^0 14'= 0.3129.

4 What do you understand by polarization of light? Explain the construction and working of Nicol prism.

OR

Define Specific rotation. Explain Fresnel' s theory of optical rotation.

5 (a) State and explain Doppler's effect in light. Calculate the change in wavelength when source is at rest and observer in motion?

OR

Explain the process of stimulated emission. Draw a neat diagram to represent the component of a Ruby Laser. Explain the operation.

(b) (i) Laser is a Coherent source of light. (true/ false)

(iii) Laser works on the principle of spontaneous emission (True/false)

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