davv bca question papers

May 2003

Bachelor of Computer Application (BCA) Examination

II semester

Physics –II

Time 3 Hours   [Max. Marks 40]

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

1 (a) Explain the reflection of electromagnetic wave from the ionospheric layers and in this reference interpret the critical frequency and the skip distance of a layer.

OR

Compare a coaxial cable and a wave guide, used as a transmission line. Point out both similarities and differences,

(b) Fill in the blank:

(i) The speed of electromagnetic wave vacuum is ………… .

(ii) In an electromagnetic wave, the electric field and the magnetic field are ……….. with each other.

2. Solve any two :

(a) Very small change in the angle of incidence do not change the interference condition much for "thin" films but they do change them for "thick" films. Why?

(b) Is Young's experiment an interference experiment or a diffraction experiment, or both? Justify your answer with example in support.

(d) Explain the reason why are Newton's rings are circular, while the fringes due to air wedge are straight.

3 (a) Describe the diffraction pattern due to Fraunhoffer diffraction of two slits. Deduce the expression for the intensity and explain it mathematically. Differentiate the diffraction patterns of one slit and two slits.

(b) A diffraction grating just resolves two wavelength 5140 A and 5140.85 A in the first order. Can this grating resolve the spectral lines corresponding to wavelengths 8035.20 A and 8035.50 A in the second order.

OR

(a) Define the term 'dispersive power of a grating; Derive an expression for it. On what factors does it depend?

(b) A zone plate is made by arranging that the radii of the circles which define the zones are the same as the radii of Newton's

rings formed between a plane surface and the surface having radius of curvature 200 cm. Find the principal focal length of the zone plate.

4 (a) Explain the Huygen's theory of double refraction in uniaxial crystals. How has the theory been experimentally verified?

OR

Explain how you can distinguish between different kinds of polarized light and also a mixture of natural and plane polarized lights. Describe the instrument you would employ for this purpose.

(b) For a given medium, the polarizing angle is 60^0. What will be the critcal angle tor the medium.

OR

A quarter wave plate is to be used with sodium light (λ =5890 A) what must its thickness be ?

(c) (i) Which phenomenon causes the polarization of Light?
    (ii) Nicol prism is based on the action of ....
        (refraction / double refraction/ scattering/ non of these)

5. (a) State and explain Doppler's effect. Deduce an expression for the change in frequency of a note of the relative motion of the observer, source and medium.

OR

Explain the process of stimulated Emission Draw a neat diagram to represent the component of a ruby laser. Explain the operation.

(b) Answer the following:

(i) when a star approaches the earths, the waves are shifted towards.......... (green colour/ yellow colour/blue end/red end)

(ii) Lasing action is triggered by spontaneous emission in a laser system (true / False).

✳ ✳ ✳