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SB-3651

M. Sc. (Bio-Technology) (Sem. I & II)
(Five Year Integrated) Examination
March / April - 2011
Biophysics

Time : **3** Hours] [Total Marks : **70**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ M. SC. (BIO-TECH.) (SEM. 1 & 2) (FIVE YEAR INTEGRATED)

Name of the Subject :

☛ BIOPHYSICS

☛ Subject Code No. : 3 6 5 1 ☛ Section No. (1, 2,.....) : NIL

Seat No. :

Student's Signature

(2) Draw neat diagrams wherever necessary.
(3) Symbols used in the question paper have their usual meaning.
(4) Figures to the right indicate full marks of the question.

1 Answer the following in brief : (any five) **10**

(i) What is photo electric effect ?

(ii) What are coherent sources ?

(iii) Define viscosity and give its unit.

(iv) State Malu's law of polarization.

(v) What are main components of laser ?

(vi) What is a laminer flow ?

(vii) What is spherical aberration ?

(viii) Calculate the momentum of a photon of wavelength 'λ'.

2 (a) What is the principle of an optical fiber ? Describe different types of optical fibers with proper diagrams. **8**

(b) Explain advantages of optical fiber. **4**

OR

2 (a) What is interference ? Derive the expression for the wavelength of monochromatic light with the help of Newton's rings. 8

(b) The radius of curvature of the lens is 100 cm in Newton's rings experiment. Calculate the radius of 4^{th} dark ring. (λ = 6000 $\mathring{A}$) 4

3 (a) Distinguish between Fraunhoffer and Fresnel's diffraction. Explain Fraunhoffer diffraction due to circular aperture. 8

(b) A single slit is illuminated by a parallel beam of light of wavelength 6000 $\mathring{A}$. If the first minimum fall at an angle θ = 18^o, calculate the width of the slit. 4

OR

3 (a) Explain the phenomenon of polarization by reflection. Derive Brewster's law. 8

(b) Describe optical activity. 4

4 (a) State and prove Bragg's law for x-ray diffraction by a crystal. How will you determine wavelength of x-rays using Bragg's law? 8

(b) Describe main application of Laser Beam. 4

OR

4 (a) Explain principle, construction and working of He-Ne laser. 8

(b) Calculate the energy of a photon of wavelength 6625 $\mathring{A}$ [h = 6.625×10^{-34} J.S., C = 3×10^8 m/s] 4

5 Write short notes on any three : 12

(i) Ultra violet and visible spectroscopy
(ii) Plasma skimming
(iii) Convective transport of gases
(iv) Poiseuille's formula
(v) Physiology of Respiration.

6 Write short notes on any three : 12

(i) Resolving power of eye.
(ii) Doppler effect.
(iii) Dalton's law of partial pressure.
(iv) Wave nature of light
(v) Chromatic aberration.