(b) Discuss the co ents of a optical fiber. Also discuss its types 15

7. (a) What are *three* ic vectors in dielectrics. Find relation betwee n. 10

(b) Find an exp n for energy stored in electrostatic fie 10

S ON – D

8. What are postulat special theory of relativity using them derive on of variation of mass with velocity. Also discu e dilation. 20

9. (a) Write a note or heory of superconductivity. 10

(b) Describe meis effect. Distinguish between type - I and typ superconductors. 10

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24003

B. Tech. Ist Semester

Examination – December, 2015

PHYSICS - I

Paper : Phy-101-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is ***compulsory***. Students have to attempt ***five*** question in total selecting at least ***one*** question from each Section. Each question carries equal marks.

1. (a) Why Newton's rings are circular ? 2

(b) What are Fresnel's half period zones ? 2

(c) Which of the polari meters (i) half shade (ii) bi-quartz is more sensitive and why ? 2

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(d) Calculate t … erence time for a laser beam for which the … vidth is $\Delta u = 3000$ Hz. 2

(e) What is ter … l coherence ? 2

(f) Calculate … ance angle of optical fiber with $\mu_{core} = 1.62$ … $_{clad} = 1.52$. 2

(g) What are r … ode step index fiber ? 2

(h) Explain th … dielectric relaxation. 2

(i) The mass … oving electron is 11 times its rest mass. Find … netic energy. 2

(j) Give som … es of high temperature super conductin… rials. 2

CTION – A

2. Explain the for… n of interference fringes by means of Fresnel's bi-… when a monochromatic source of light is used a… rive the expression for the fringe width. How … ou measure the wavelength of monochromati… using bi-prism method ? 20

3. (a) What is a … plate ? Show that zone plate has multiple f… 16

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(b) A parallel beam of sodium light is allowed to be incident normally on a plane grating having 5000 lines/cm and a second order spectral line is observed to be deviated through 30°. Calculate the wavelength of light used. 4

SECTION – B

4. (a) Give the construction and working of a lorentz half shade polarimeter. What is its main drawback ? 14

(b) Write a note on Quarter and Half wave plate. 6

5. (a) Discuss the essential requirements for producing laser action. Describe a semiconductor laser. 14

(b) What are the specialities of a laser light. 6

SECTION – C

6. (a) Calculate the refractive indices of core and cladding material of a fiber from following data N. A = 0.22, Δ = 0.012, where N. A = Numerical aperture Δ = Fractional refractive index. 5

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