Roll No .....

BE - 201

B.E. I & II Semester

Examination, December 2013

Engineering Physics

Time : Three Hours

Maximum Marks : 70

Note: Attempt one question from each unit. All questions carry equal marks.

Unit - I

1. a) State and explain Heisenberg's uncertainty principle. Discuss an experimental illustration of it. 7
   b) An X-ray photon of wavelength 0.4A° is scattered through an angle 45° by a loosely bound electron. Find the wavelength of the scattered photon. 7

OR

2. a) Derive Schrödinger time-independent equation for matter wave. 7
   b) Obtain expression of energy levels for particle trapped in one dimensional square with infinitely deep potential well. 7

Unit - II

3. a) Describe the construction and working of Michelson's interferometer. Explain the principle of formation of circular fringes. 7
   b) Discuss working of Nicol prism as polarizer and analyser. 7

OR

4. a) Obtain an expression for maxima and minima due to diffraction of light by single slit. 7
   b) A plane transmission diffraction grating has 45000 lines. Determine its resolving power in the second order for wavelength of 5000A°. 7

Unit - III

5. a) Explain the postulates of the liquid drop nuclear model. 7
   b) Discuss the working of Betatron and obtain the relation for betatron condition. 7

OR

6. a) Describe the construction and working of Bainbridge mass spectrograph. 7
   b) A G.M. counter wire collects 10^8 electrons per discharge when the counting rate is 500 counts/minute. What will be the average current in the circuit? 7

Unit - IV

7. a) Describe the behaviour of an electron in periodic potential using the final expression of Kronig-Penney Model. 7
   b) What is super conductivity? Discuss Meissner effect. 7

OR

8. a) Discuss the basic operation and characteristic of a solar cell with necessary diagram. 7
   b) Explain dielectric loss. Obtain an expression for loss tangent of it. 7

Unit - V

9. a) Discuss construction and working of He-Ne laser with energy level diagram. 7
   b) An SI optical fiber of diameter 55μm has a numerical aperture of 0.23. If the wavelength of input light is 0.82μm, determine the number of modes of the cable. 7

OR

10. a) Obtain the relation between the transition probabilities of Einstein's A and B coefficient. 7
    b) Write a short note on different loss mechanism in an optical fiber. 7

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