SAHRDAYA COLLEGE OF ENGINEERING & TECHNOLOGY

KODAKARA

Combined First and Second Semester B. Tech. Degree Examination

April,2013

MODEL QUESTION PAPER

[Common for all B. Tech. Branches]

**EN09 103 – ENGINEERING PHYSICS**

Time: 3hours Maximum Marks: 70

Part A

(Answer all questions: 5 x 2 marks = 10 marks)

1. What is meant by population inversion?
2. What is called nanomaterials?
3. Distinguish between Fresnel and Fraunhofer diffraction?
4. Explain Meissner effect?
5. How do you test, the planeness of a glass plate by interference method?

Part B

(Answer any four questions: 4 x 5 marks = 20 marks)

1. Explain how you will distinguish between plane polarised and circularly polarised light?
2. Derive condition for bright and dark fringes of interference pattern due to reflected light?
3. Calculate the numerical aperture, critical angle and acceptance angle if the refractive indices of the core and cladding are 1.55 and 1.48 respectively?
4. Explain the properties and application of carbon nanotube?
5. Explain Type I and Type II superconductors?
6. Explain how reverberation time affects the acoustic of building? Also give a brief account of corrective measures.

Part C

(Answer section (a) or section (b) of each question: 4 x 10 marks = 40 marks)

1. (a) Explain Bragg’s law. Explain Bragg’s X-ray spectrometer. How will you verify Bragg’s law using it?

OR

(b). State Rayleigh’s criteria for the resolution of spectral lines? Distinguish between the resolving power and dispersive power of the diffraction grating?

1. (a). With the help of a neat diagram explain the construction and working of He-Ne laser. Mention the application of laser in Medical fields?

OR

(b). Derive a relation connecting the Numerical aperture and the refractive indices of the core and cladding. Explain the advantages of optic fibre communication.

1. (a).How does the Fermi level change with temperature in extrinsic semiconductor? Discuss the effect of increasing amount of dopants in extrinsic semiconductor.

OR

(b).What is Avalanche multiplication and Zener break down. Explain the construction and working of a Zener diode. Discuss its action as voltage stabilizer.

1. (a).Explain the ultrasonic diffractometer with neat diagram. How will you determine the velocity and wavelength of ultrasonic waves in a liquid?

OR

(b). Using Schrodinger’s wave equation, derive wave function and energy of a particle in a box in one dimension

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