

**B.Tech I Year(R07) Supplementary Examinations, May/June 2010**  
**ENGINEERING PHYSICS**

**(Common to Civil Engineering and Mechanical Engineering)**

**Time: 3 hours****Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) What do you mean by resolving power of an instrument?  
(b) Explain Rayleigh's criterion of resolution.  
(c) Explain the usefulness of the Rayleigh's criteria for the resolving power of an optical instrument. [4+8+4]
2. (a) Explain the factors like reverberation, reverberation time, loudness and echo are affecting the architectural acoustics.  
(b) How the above mentioned difficulties are overcome. [10+6]
3. (a) Define the term Intensity of Magnetization.  
(b) Define the term Magnetic Permeability.  
(c) Mention the properties of soft and hard magnetic materials. [4+4+8]
4. (a) What are Miller indices? What is their significance?  
(b) Draw the successive parallel planes of (100), (110) and (111) of Simple Cubic. [6+10]
5. (a) What is meant by LIDAR?  
(b) Give the comparison chart between the lasers Ruby, Nd-Yag, He-Ne, CO<sub>2</sub> and Ga - As.  
(c) A CO<sub>2</sub> laser source emits light at a wavelength of 9.6 $\mu$ m and has an output power of 10KW. How many photons are emitted in each hour by this laser while operating? [4+8+4]
6. (a) What is the basic principle for optical fiber communication?  
(b) Describe the fiber optic communication with neat diagram.  
(c) Calculate the total number of guided modes propagating in the multimode step index fiber having diameter of 50 $\mu$ m and numerical aperture of 0.2 and operating at a wavelength of 1 $\mu$ m. [4+8+4]
7. (a) Define dielectric constant.  
(b) Explain the electronic polarization with neat diagram and also give the relation between electronic polarization and dielectric constant.  
(c) Define polarization vector and electric displacement vector. [4+8+4]
8. (a) Discuss the chemical properties of nano materials.  
(b) Analyze the application of nano technology in the bio fields. [8+8]

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