Roll No .....

PH-110

B.E. (All Branches) I Year II Semester

Examination, June 2016

Choice Based Credit System (CBCS)

Physics

Time : Three Hours

Maximum Marks : 60

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Explain Maxwell's equations in differential and integral forms.

   b) Obtain the divergence of following function:

$$\bar{f}(r) = 3x\hat{i} + 2y^2\hat{j} + 6z^3\hat{k}$$

2. a) Explain the construction and working of a He-Ne laser with energy level diagram.

   b) Give four major properties of a laser light.

3. a) Derive the expression for numerical aperture of a step index optical fiber.

   b) Obtain the V-number and number of modes supported by a step-index optical fiber having care index 1.48, cladding index 1.46 and the source wavelength 1.2μm.

4. a) Derive the expression for compton shift in a compton scattering process.

   b) Explain Heisenberg's Uncertainty principle.

5. a) Derive the conditions for maxima and minima in interference of light reflected from a thin film.

   b) Enlist four differences between interference and diffraction.

6. a) Explain Hall effect and derive expression for Hall mobility.

   b) Explain V-I characteristics of a photovoltaic cell.

7. a) Explain the liquid drop model for a nucleus and various energy terms therein.

   b) Differentiate between nuclear fission and fusion processes.

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