Uni. Roll No.....

GLA University, Mathura

Course: B.Tech, I-Year, II - Mid Term (Odd Sem.) Examination, 2013-14

Subject: Engineering Physics - I (AHP-101)

Time: 90 Minutes **M. M: 20**

Notes:-

1. Answer **Any Four** questions from **Section A, Any Two** from **Section B** and **Any Two** from **Section C.**
2. All questions of a particular section should be answered collectively at one place.
3. Answer should be to-the-point and whatever required supplemented with neat sketches.
4. Any missing data may be assumed suitably giving proper justification.
5. Figures on the right-hand side margin indicate marks.

Section-A

Attempt any four questions. **1× 4 = 4**

Q.1 What are characteristics of laser beam?

Q.2 What is the difference between ordinary and extra ordinary ray of polarisation?

Q.3 What is optical pumping?

Q.4 Classify optical fibres on the basis of material and modes.

Q.5 If numerical aperture for an optical fibre is 0.5, find the acceptance angle?

Section-B

Attempt any two questions. **3× 2 = 6**

Q.1 Define specific rotation. A 20 cm long tube containing 40 cm^3 of sugar solution rotates the plane of polarization by 11°. If the specific rotation of sugar is 66°, calculate the mass of sugar in the solution.

Q.2 What is quarter wave plate? Find the thickness of a quarter wave plate when the wavelength of light is equal to 6000Å and $\mu_o = 1.55$, $\mu_e = 1.54$.

Q.3 Write the differences between step index and graded index fibre.

Section-C

Attempt any two questions. **5 × 2 = 10**

Q.1 Discuss the superposition of two linearly polarized light waves having perpendicular vibrations and derive the expressions for linearly, circularly and elliptically polarized light.

Q.2 Discuss the Fresnel ´s theory of optical rotation and derive the expression for the optical rotation of plane of vibration by optically active substance.

Q.3 What are Einstein's coefficients? Derive relation between them.