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PH-101/1843

B. Tech. (Semester-I) Examination-2018 Engineering Physics

Time: Three Hours Maximum Marks: **50**

Note: Attempt questions from all the sections.

Section-A

(Short Answer Type Questions)

Note: Attempt any ten questions. Each question carries 2 marks. (2x10=20)

1. Define the length contraction.

- 2. Calculate the rest mass, relativistic mass and momentum of a photons of energy 5ev.
- 3. Explain the relativistic addition of velocities.

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- 4. What is interference of light?
- 5. Explain Rayleigh's criterion of resolution.
- 6. Describe the construction and action of the ruby laser?
- 7. What is Nicol prism?

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- 8. Deduce an expression for the variation of mass with velocity.
- 9. Distinguish between ordinary light and laser radiation.
- 10. How many lines per centimetre are there in a plane transmission grating which gives 1^{st} order of light of wave length 6000Å at angle of diffraction 30^{0} ?
- 11. What is Hologram? Explain with diagram the basic principle of holography.

- 12. Explain the colours when a thin film illuminated by white light is observed in reflected light.
- 13. Discuss briefly Michelson–Morely experiment and mention its outcome.
- 14. The rest mass of a proton is 1.67×10^{-27} kg. At what speed will its mass be double its rest mass?
- 15. Discuss briefly the working principle of a polarimeter.

Section-B

(Long Answer Type Questions)

Note: Attempt any two questions. Each question carries 15 marks. (15x2=30)

- 1. Prove the relation $E^2 P^2 C^2 = M^2 C^4$ where P is the momentum.
- 2. Explain phenomenon of diffraction and distinguish Fresnel and Fraunhofer diffractions. Obtain intensities of diffraction pattern in fraunhofer diffraction due to a single slit.

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3. Describe and explain the phenomenon of optical rotation. Show that $\theta = \frac{\pi l}{\lambda} (\mu_L - \mu_R)$, where symbols have their usual meaning.

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4. Explain basic principle of optical fibre, Discuss fibre classification.

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