## section- C

Long type.

Q.1. What was the objective of conducting the Michelson-Morley experiment? Describe the experiment. How is negative result of the experiment interpreted.

Q.2. State the fundamental postulates of Special theory of relativity and hence derive Lorentz transformation equation.

Q.3. Derive Einstein's mass energy relation $E = mc^2$. Give some evidence to prove its validity.

Q.4. Verify the statement that no material particle

Q.5. Discuss the formation of interference fringes due to a wedge shaped thin film seen by normally reflected sodium light and obtain an expression for the fringe width.

Q.6. Describe and explain the formation of Newton's ring in reflected monochromatic light. Explain why Newton's rings are circular.

Q.7. Discuss Fraunhoffer's diffraction at a double slit. What are missing orders.

Q.8. Explain Rayleigh crieteria for limit of resolution. obtain expression for resolving power of a grating.

Q.9. Describe the phenomenon of optical rotation with the help of Fresnel's theory. Show that $\theta = \frac{\pi l}{\lambda}(\mu_L - \mu_R)$ where symbols have their usual meaning.

Q.10. Describe the construction and working of a Laurent's half shade polarimeter, How would you use it to determine the specific rotation of Cane sugar.

Q.11. What are Einstein's co-efficients. Derive Einstein relation.

Q.12. Discuss the Construction and reconstruction of image on a hologram with neat diagram. Give some of ~~applications (industrial)~~ its industrial application.

Q.13. Discuss propagation of light in single mode, multimode and graded index fibres.

Q.14. What do you mean by pulse broadening? Discuss dispersion in optical fibres in detail.