1629

Roll No. .....
Printed Pages : 2

GSM/ M-18
WAVE AND OPTICS
Paper–VIII

Time allowed : 3 hours] *[Maximum marks : 40*

Note :- *Attempt **five** questions in all. **Question number 1 is compulsory. Four** more questions are to be attempted by selecting **one** question from each of the **four** units. Use of Scientific (non-programmable) calculator is allowed.*

1. (a) Why sound waves can not be polarised? 1

   (b) How you can detect a plane polarised, a partially plane polarised and unpolarised light beam? 2

   (c) What are Dirichlet conditions for the validity of a periodic function to be expanded in Fourier Series? 2

   (d) What are applications for Fourier transforms? 2

   (e) What is difference between a pin-cushion and barrel distortion? 1

2. (a) What is optically active substance and what is specific rotation? 2

   (b) Explain construction, working and uses of Laurent's half-shade polarimeter. 6

3. (a) What are quarter wave and half wave plates? Explain their uses. 4

   (b) Two Nicol prisms are in crossed position. What % of unpolarised light incident on this combination will pass through if one of the two Nicols is rotated through 60°. 4

Unit–II

4. What is Fourier Series? Use this for analysis of output from a full wave rectifier. Define ripple factor and find its value in output from the full wave rectifier. 8

5. (a) State and prove Parseval's theorem. 6

   (b) Give Fourier integral for even function. 2

Unit–III

6. (a) State and prove modulation theorem for Fourier transform. 3

   (b) Show that the Fourier transform of a Gaussian function is also a Gaussian function. 5

7. Why matrix methods are used in paraxial optics? What is translation matrix. Discuss the method for formation of translation matrix. 8

Unit–IV

8. (a) What are aberrations? What are its different types? 2

   (b) Explain spherical aberration and give various methods to minimize it. 6

9. (a) What is optical fibre? Explain its different types. 4

   (b) Write short note on applications of optical fibres. 4