PG/IIIS/ELC/395/24(Pr.)

M.Sc. 3rd Semester Examination, 2024

ELECTRONICS

(*Electronic and Optical Communication Lab*)

(Practical)

PAPER – ELC-395

Full Marks : 50

Time : 3 hours

Answer any **one** question selecting it by **lucky** draw

The questions are of equal value

1. Generate an amplitude modulated (AM) signal using a transistor on a breadboard. Record your result for different amplitude with a fixed frequency of the modulating signal. Repeat it for another fixed input frequency. Calculate the values of modulation indices.

2. Generate pulse amplitude modulated (PAM) signal using a transistor. Observe the output and record the amplitude and time period. Repeat the same for another set.

3. Design and implement a circuit using IC OTA 3080 for amplitude modulation. Record the data for the modulating signal amplitude at fixed frequency and calculate the modulation index. Repeat the same for the modulating signal amplitude at another fixed frequency. Plot the variations of modulation indices with variations of modulation signal amplitude.

4. Design and implement a circuit on breadboard to generate pulse width modulated (PWM) signal using IC 555. Observe the output and record the data. Plot the width of pulses with time. Repeat the process for another set of modulating signal.

5. Design and implement a circuit for optical conversion of 4-bit signal to its analog form by R-2R ladder network. Record the results and plot the output data with digital inputs.

(*Continued*)

6. Design a frequency modulation circuit using IC 8038 and implement it on a breadboard. Verify the operation of the circuit and calculate the frequency deviation and modulation index.

7. Draw the characteristics of the given LDR for three light intensities. Calculate LDR resistances for each case and compare them.

8. Measure the dimension of a circular aperture by LASER beam.

9. Design and implement an amplitude modulated (AM) wave generator circuit. Use an envelope detector to demodulate the AM signal. Compare the demodulated output with the original modulating signal, highlighting any discrepancies.

10. Measure the numerical aperture of an optical fiber. Calculate the acceptance angle for the fiber and discuss its significance in light propagation.

Distribution of Marks

Theory	– 05 Marks
Circuit	– 10 Marks
Experiment	– 15 Marks
Results and discussions	– 05 Marks
Viva-voce	– 10 Marks
Laboratory Note Book	– 05 Marks
Total :	– 50 Marks