

2025

M.Sc. 3rd Semester Examination

ELECTRONICS

Paper : ELC - 305

(Electronic and Optical Communication Lab)

[Practical]

Full Marks : 50

Time : Three Hours

The questions are of equal value.

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

1. 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.
2. 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.

3. 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.

4. 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 index with variations of modulation signal amplitude.

5. Design an amplitude demodulation circuit with an envelope detector. Plot the demodulated waveform for 60% and 75% modulation. Compare the results.

6. 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.

(3)

7. Find the numerical aperture of the given optical fiber. Calculate the acceptance angle for the fiber.

8. 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.

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

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

(4)

Distribution of Marks

Theory : 05 Marks

Circuit : 10 Marks

Experiment : 15 Marks

Results and discussions : 05 Marks

Viva-voce : 10 Marks

Laboratory Notebook : 05 Marks

Total : 50 Marks
