PG/IIS/ELC/395/22(Pr.)

M.Sc. 3rd Semester Examination, 2022

ELECTRONICS

PAPER – ELC-395

(VLSI Lab)

Full Marks : 50

Time : 3 hours

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

The questions are of equal value

Candidates are required to give their answers in their own words as far as practicable

1. Draw half adder circuit using SPICE. From the circuit diagram, obtain the SPICE code of the circuit. Give input and output waveforms of the circuit.

2. Draw DC analysis of the CMOS inverter circuit. Vary width to length ratio (W/L) of the circuit. Give input and output waveforms of the circuit. Use LT SPICE software.

3. Draw schematic diagram of a NAND gate. Obtain the SPICE code from the circuit diagram. Give input and output waveforms.

4. Draw schematic diagram of a NOR gate using SPICE. Obtain the SPICE code from the circuit diagram. Give input and output waveforms of the circuit.

5. Draw layout of an inverter circuit using software. Draw the obtained input and output waveforms.

6. Draw layout of a NAND gate. Obtain the input and output waveforms.

7. Draw layout of a NOR gate. Obtain the input and output waveforms.

8. Write verileg code for full adder circuit. Obtain the input and output waveforms.

9. Write verileg code for $y = \overline{AB + C}$ obtain input and output waveforms.

10. Write verileg code for X-OR gate. Obtain input and output waveforms.

11. Write verilog code for J.K flip-flop and give input-output waveforms.

12. Write verilog code for counter (any type) and give input-output waveforms.

Marks Distribution

Program :	10 marks
Execution :	10 marks
Result :	15 marks
Viva-voce :	10 marks
Laboratory note book :	05 marks
Total :	50 marks

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PG 3rd Semester Examination, 2022

ELECTRONICS

(*Communication Laboratory/Practical*)

PAPER – ELC-396

Full Marks : 50

Time : 3 hours

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

The questions are of equal value

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

1. Generate an amplitude modulated (AM) signal using a transistor on a breadboard. Calculate the modulation index. Demodulate the AM wave using a suitable envelope detector circuit.

2. Design and implement a circuit on breadboard to generate PWM signal using IC 555. Observe PWM

output and record the data with pulses. Plot width of the pulses with time. Repeat this process for another set of modulating signal.

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

4. Design and implement a circuit using IC OTA 3080 for amplitude modulation. Record the data for three sets of modulating signal amplitude at fixed frequency and calculate the modulation index for each case.

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

6. Design a frequency modulation circuit using IC 8038 and implement it on a breadboard. Record the data for two modulating signal frequencies and calculate the frequency deviation and modulation index.

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

8. Write programs to generate (*i*) unit step sequence, (*ii*) sinusoidal sequence, (*iii*) exponential sequence and (*iv*) addition of two sinusoidal sequences. Execute the program and take the results.

9. Design and implement a circuit for optical conversion of 4-bit signal to its analog form by R-2R ladder network.

10. Design a FIR filter and simulate it with a suitable simulator.

Distribution of Marks

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