2016

M.Sc.

2nd Semester Examination

ELECTRONICS

PAPER—ELC-206

(PRACTICAL)

Full Marks : 50

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

(Electronic Materials and Device Lab)

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

1. Implement the function $F = \Sigma m\ (0,2,3,7,10,12)$ on a bread board using 16:1 Multiplexer. Record the data in a table.

   Implement the same function using a 8:1 Multiplexer and necessary logic gates.

2. Realize a Ex-OR function of two variables using multiplexer chip.

3. (a) Design a 4:16 decoder circuit using two 3:8 decoders and necessary logic gates.

   (b) Implement the following functions using a 3:8 decoder.

   $$F = \Sigma m(0, 1, 4, 5, 7)$$

4. Implement 'sum' and 'carry' output of a full-adder circuit using a 3:8 decoder.

5. Design a 4-bit shift register using J–K flip-flop on a bread board. Record for five sets of data.

   Test the performance of a standard IC shift Register (IC 7495).

6. Design a 4-bit ripple counter using J–K flip-flops and implement it on the bread board. Record data. Draw the timing diagram.

7. Implement an adder-subtracter circuit on a bread board using 7483 IC chip. Record four sets of data. Show the sign of the subtracted data in your circuit.

8. Design a circuit to perform addition of two BCD numbers using 7483 IC chip . Implement it on a bread board and record data for atleast four sets.

(Continued)

9. From the I–V measurement of a P–N junction diode determine cut-in voltage, reverse saturation current and material constant of the device.

10. Find the band gap of a semi-conductor.

11. Measure the junction capacitance of a P–N function diode for different applied reverse voltage. Draw the C–V characteristics and determine doping concentration of the 'N' type semiconductor.

12. Study the operational characteristics of a TRIAC and draw it on a graph paper.

Marks Distribution

Theory	:	10
Circuit	:	05
Experiment	:	15
Discussion	:	05
Viva-Voce	:	10
LNβ	:	05
Total	:	50

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(Turn Over)