2015

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 $F = \Sigma m$ (1,3,4,7,10,11) on a bread board using 16:1 Multiplexer. Record the data in a table. Implement again the same function using 8:1 Multiplexer and necessary logic gates.

(Turn Over)

2. Design a 4:16 decoder circuit using two 3:8 decoders and necessary logic gates. Verify your results. Also implement the function $F = \Sigma m$ (1,3,4,7,10,11) using your newly designed 4:16 decoder.

3. Design a 4-bit shift register using J–K flip-flop on a bread board. Show your results for four sets of data. Compare the performance of your circuit with a standard IC shift register (7495).

4. Design a 4-bit ripple counter using J–K flip-flops and implement it on a bread board. Extend your above design to make a 4 bit ripple counter using IC 7493.

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

6. Implement an adder & subtractor circuit on a bread board using 7483 IC chip. Record four sets of data both for addition and subtraction.

(Continued)

7. From the current voltage measurement of a P–N junction diode, determine the reverse saturation current and material constant of the device.

8. Determine band gap of a semi-conductor from the temperature sensitive function voltage measurements.

9. Determine the junction capacitance of a P–N function diode for different applied reverse voltage. Draw the C–V characteristics. Assume the junction is a P–N function and determine doping concentration of the N-type semiconductor.

10. Study the operational characteristics of a SCR and DIAC. Draw the I–V curve on a graph paper.

11. Study the operational characterisation of a TRIAC and draw its characteristics on a graph paper.

12. Design a full adder circuit using a 3:8 decoder.

(Turn Over)

<u>**Marks Distribution**</u>

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

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