

M.Sc. 3rd Semester Examination, 2024

ELECTRONICS

(Introduction to Electronics)

PAPER – ELC-304(CBCS)

Full Marks : 50

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

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

GROUP – A

Answer any **four** questions : 2×4

1. Draw a differentiator circuit using OPAMP. 2
2. Subtract the following $(4343)_5 - (3434)_5$ 2

(Turn Over)

3. Differentiate between MUX and DEMUX. 2
4. Draw the reverse and forward bias characteristics of a Zener Diode. 2
5. What is the advantage of a master slave flip flop ? 2
6. Why do we need modulation ? 2

GROUP – B

Answer any **four** questions : 4 × 4

7. How Zener diode can be used as voltage regulator ? 4
8. What is a hand off in wireless mobile communication ? Explain the process briefly. 1 + 3
9. Design a full subtractor circuit. 4
10. Implement the following Boolean expression using a MUX $\Sigma(3,2,5,7)$ 4

11. Draw the output characteristics of a BJT and explain how it can be used as a NOT gate. 2 + 2
12. (a) What do you mean by cut off region and saturation region for a transistor ?
- (b) Explain the difference between them and mention one application of each. (1 + 1) + 2

GROUP – C

Answer any two questions : 8 × 2

13. Design a MOD-6 synchronous counters. 8
14. Compare between half and full wave rectifier. Draw the circuit diagram of a half wave rectifier and explain its operation. 3 + 5
15. Design a MOD-8 asynchronous counter. 8
16. (a) Simplify the following :
- $$xy + \bar{x}z + yz$$

(4)

(b) Express the complement of the following functions in sum-of-minterms.

(i) $F(A,B,C,D) = \Sigma(3,5,9,11,15)$

(ii) $F(A,B,C,D) = \Pi(2,4,5,7)$ 2 + 3 + 3

[Internal Assessment – 10 Marks]
