Paper IV   Practical

Note: Students are required to perform all the experiments. In the examination three exercises selecting two from part A and one from part B will be set.

Marks Distribution:

Part A: 24 Marks

Theory: 12 Marks & Logic diagram and verification on digital kits: 12

Part B: 24 Marks

Algorithm and flowchart: 6 Marks, Program coding: 6 Marks

Program execution, result and documentation: 12 Marks

Viva: 12 Marks,

Practical Record: 15 Marks (Regular submission of practical records and evaluation by teachers, Regular attendance in the practical classes)

Part A: Digital Electronics

1. To study the function of Basic logic gates and verify their truth table AND, OR, NOT, NAND, NOR, XOR, XNOR.
2. To study the application of AND, OR, NAND, XOR gates for getting digital signals
3. (a) The study of different logical expression and their simplifications.

    (b) To familiarize and verify the Boolean algebraic theorems.

4. To study the different arithmetic circuits.

    (a) Half adder and subtractor
    (b) Full adder and subtractor

5. To study the BCD to binary and Binary to BCD code converter.
6. To study the binary- to -gray and Gray-to binary code converter.
7. Study of the encoder - circuits.

    (a) Decimal to BCD- encoder
    (b) Octal to binary encoder.

8. Study of decoder circuits.

    (a) BCD - to - decimal decoder.

(b) BCD - to - 7 Segment decoder.

9. To study the Flip flop circuits using gates.

   (a) R-S flip flop
   (b) J-K flip flop
   (c) Master slave J-K flip flop
   (d) D- flip flop

10. To study the R-S, J-K and D-flip flop ICs
11. To study the shift registers and ripple counter.
12. To study the asynchronous counter using flip flop ICs.
13. To study asynchronous counter ICs.
14. To study synchronous counter ICs.
15. To study synchronous counter using flip flop ICs.

Part B : Numerical Methods

Numerical methods implementation using any programming language.

1. Program for addition, subtraction, multiplication of matrices.
2. Program to find transpose, inverse of matrix.
3. Program to test symmetry of matrix.
4. Program to find root of an equation by

   (a) Bisection method
   (b) False position method
   (c) Newton Raphson method.

5. Solution of differential equation by

   (a) Runge Kutta method
   (b) Predictor corrector method

6. To solve simultaneous equations by

   (a) Gauss Siedel method
   (b) Gauss elimination method

7. To find integral of a function using

   (a) Trapezoidal method
   (b) Simpson method

8. To interpolate a function using Langrange's interpolation method.
9. To find complex roots of an equation using Bairstow's method.
10. To fit linear and exponential curves using least square fit method.