

14. Design, develop, and execute a program in C++ to create a class called BIN_TREE that represents a Binary Tree, with member functions to perform inorder, preorder and postorder traversals. Create a BIN_TREE object and demonstrate the traversals.

Note: In the examination each student picks one question from a lot of *all* the 14 questions.

ELECTRONIC CIRCUITS & LOGIC DESIGN LABORATORY
(Common to CSE & ISE)

Subject Code: 10CSL38

Hours/Week : 03

Total Hours : 42

I.A. Marks : 25

Exam Hours: 03

Exam Marks : 50

PART-A

1. a) Design and construct a suitable circuit and demonstrate the working of positive clipper, double-ended clipper and positive clamper using diodes.
b) Demonstrate the working of the above circuits using a simulation package.
2. a) Design and construct a suitable circuit and determine the frequency response, input impedance, output impedance, and bandwidth of a CE amplifier.
b) Design and build the CE amplifier circuit using a simulation package and determine the voltage gain for two different values of supply voltage and for two different values of emitter resistance.
3. a) Design and construct a suitable circuit and determine the drain characteristics and transconductance characteristics of an enhancement-mode MOSFET.
b) Design and build CMOS inverter using a simulation package and verify its truth table.
4. a) Design and construct a Schmitt trigger using Op-Amp for given UTP and LTP values and demonstrate its working.
b) Design and implement a Schmitt trigger using Op-Amp using a simulation package for two sets of UTP and LTP values and demonstrate its working.


H.O.D.

5. a) Design and construct a rectangular waveform generator (Op-Amp relaxation oscillator) for given frequency and demonstrate its working.
- b) Design and implement a rectangular waveform generator (Op-Amp relaxation oscillator) using a simulation package and demonstrate the change in frequency when all resistor values are doubled.
6. Design and implement an astable multivibrator circuit using 555 timer for a given frequency and duty cycle.

PART – B

7. a) Given a 4-variable logic expression, simplify it using Entered Variable Map and realize the simplified logic expression using 8:1 multiplexer IC.
- b) Design and develop the Verilog /VHDL code for an 8:1 multiplexer. Simulate and verify its working.
8. a) Realize a J-K Master / Slave Flip-Flop using NAND gates and verify its truth table.
- b) Design and develop the Verilog / VHDL code for D Flip-Flop with positive-edge triggering. Simulate and verify its working.
9. a) Design and implement a mod-n ($n < 8$) synchronous up counter using J-K Flip-Flop ICs and demonstrate its working.
- b) Design and develop the Verilog / VHDL code for mod-8 up counter. Simulate and verify its working.
10. a) Design and implement a ring counter using 4-bit shift register and demonstrate its working.
- b) Design and develop the Verilog / VHDL code for switched tail counter. Simulate and verify its working.
11. Design and implement an asynchronous counter using decade counter IC to count up from 0 to n ($n \leq 9$) and demonstrate its working.
12. Design and construct a 4-bit R-2R ladder D/A converter using Op-Amp. Determine its accuracy and resolution.

Notes:

1. In the examination, each student picks one question from the lot of questions, either from Part-A or from Part-B. About half the students in the batch are to get a question from Part-A while the rest are to get the question from Part-B.
2. Any simulation package like MultiSim / Pspice etc may be used.

IV SEMESTER

ENGINEERING MATHEMATICS IV
(Common to CSE & ISE)

Subject Code: 10MAT41
Hours/Week : 04
Total Hours : 52

I.A. Marks : 25
Exam Hours: 03
Exam Marks: 100

PART – A

UNIT – 1

Numerical Methods: Numerical solutions of first order and first degree ordinary differential equations – Taylor's series method, Modified Euler's method, Runge – Kutta method of fourth order, Milne's and Adams-Bashforth predictor and corrector methods (All formulae without Proof). **6 Hours**

UNIT – 2

Complex Variables: Function of a complex variable, Limit, Continuity Differentiability – Definitions. Analytic functions, Cauchy – Riemann equations in cartesian and polar forms, Properties of analytic functions. Conformal Transformation – Definition
Discussion of transformations: $W = z^2$, $W = e^z$, $W = z + (1/z)$, $z \neq 0$
Bilinear transformations. **7 Hours**

UNIT – 3

Complex Integration: Complex line integrals, Cauchy's theorem, Cauchy's integral formula. Taylor's and Laurent's series (Statements only)
Singularities, Poles, Residues, Cauchy's residue theorem (statement only) **6 Hours**

UNIT – 4

Series solution of Ordinary Differential Equations and Special Functions: Series solution – Frobenius method, Series solution of Bessel's D.E. leading to Bessel function of first kind. Equations reducible to Bessel's **7 Hours**