

19/05/2025 SE ELECTRICAL SEM-IV C-SCHEME DE QP CODE: 10085663

Duration: 3 Hours**Marks: 80**

Note:

1. Question No. 1 is compulsory.
2. Attempt any three questions out of the remaining five questions.
3. Assume suitable data wherever necessary.
4. Figures to the right indicate full marks.

- 1 Answer any FOUR questions [20]
 - a Convert 25.45 decimal number to equivalent binary, hexadecimal, octal numbers. [5]
 - b Using the truth table, prove that $AB + \bar{A}B + \bar{A}\bar{B} = \bar{A} + B$ [5]
 - c Given the logic $Y = (A + BC)(B + \bar{C}A)$, reduce it using Boolean theorem and realize using NAND gates.
 - d Differentiate between combinational circuit and sequential circuit with the help of suitable examples for each. [5]
 - e Discuss various specifications of Digital to analog converter. [5]
 - e List the difference between random access memory and read only memory. [5]
- 2 a Explain BCD code, excess 3 code and gray code. Tabulate these three code for 4 bits binary number. Explain the concept of negative numbers in binary number system [10]
 - b What are different logic families? Explain RTL logic based OR gate with the help of suitable diagram. [10]
- 3 a Realize the logical $f(A, B, C, D) = \sum m(0, 1, 4, 5, 7, 9, 11, 12, 14) + d(2, 8, 13)$ using NAND gate after minimizing by K-map [10]
 - b Realize the logic circuit for half adder, full adder, half subtractor and full subtractor using K map. [10]
- 4 a Explain the mode and state of counter. Design and explain the working of mode 10 asynchronous upcounter. [10]
 - b Design a 3 bits synchronous counter and explain the working with the help of suitable diagrams. [10]
- 5 a Design and explain a 4 bits parallel in serial out shift register with the help of suitable diagrams. [10]
 - b Explain the application of ROM as programmable logic device [10]
- 6 a Explain the output of a 4 bits R-2R type DAC if the digital input is 1010. Use suitable diagrams wherever applicable. [10]
 - b Explain working of dual slope ADC with the help of suitable diagrams. Explain its advantages [10]