B.Tech. / B.E. Computer Science & Engineering (Model Curriculum) Sem-III
104 / SE104CS - Digital Electronics

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Notes : 1. All questions carry marks as indicated.
         2. Assume suitable data wherever necessary.
         3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Show that both NAND gate and NOR gate are universal gate.   **8**

   b) Do as directed: **8**
       i) $(1762.46)_8 = ()_D = ()_{16}$

       ii) $(FA8)_{16} = ()_{10} = ()_2$

       iii) Add 984 and 599 using BCD addition method.

       iv) Add -25 to + 14 using 8 bit 1's complement method.

OR

2. a) Explain following binary codes in detail.   **8**

       i)   Cyclic code.

       ii) Error correcting and error detecting codes.

       iii) Reflective code.

       iv) Self complementing code.

   b) Device a single error correcting code for a 11 bit group 01101110101. Test the following   **8**
       Hamming code sequence for 11 bit message and correct if it is necessary
       (101001011101011).

3. a) Simplify the following logic function $F = \Sigma m(2,6,8,9,10,11,14,15)$ **8**
       Using Quine- Mccluskey method.

   b) Implement the following logic function using a 8x1 MUX   **8**
       $F(A,B,C,D) = \Sigma m(1,3,4,11,12,13,14,15)$

OR

4. a) Design full adder using two half adder.   **8**

   b) Design 2 bit comparator.   **8**

5. a) Explain D flip flop with following points. **8**

     i) Logic diagram.   ii) Truth table.

     iii) Working.   iv) Characteristic equation.

     v) Excitation table.

   b) Write a short note on Parallel in serial out shift register. **8**

<p align="center">OR</p>

6. a) Explain the working of two bit ripple up/down counter using positive edge triggered flip flop. **8**

   b) Write a short on ring counter. State the application of the counter. **8**

7. a) Explain dual slope A/D converter in detail. **8**

   b) Write short note on counter type A/D converter. **8**

<p align="center">OR</p>

8. a) Write short note on the following: **8**

     i) Quantization.

     ii) Encoding and sampling.

   b) Discuss with the help of neat block diagram successive approximation A/D converter. **8**

9. a) Write a note on PAL. **8**

   b) Define memory. Classify the types of memories and differentiate between RAM and ROM. **8**

<p align="center">OR</p>

10. a) Give the PLA realization of the following function using a PLA with 5 inputs, 4 outputs and 8 AND gates. **8**
$$F_1(A,B,C,D,E) = \Sigma m(0,1,2,3,11,12,13,14,15,16,17,18,19,27,28,29,30,31)$$
$$F_2(A,B,C,D,E) = \Sigma m(4,5,6,7,8,9,10,11,20,21,22,23,30)$$

   b) Explain the structure and working of FPGA. **8**

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