

B.E. Computer Science & Engineering Sem-III (MODEL CURRICULUM)
SE104CS : Digital Electronics

P. Pages : 2

Time : Three Hours



GUG/W/22/13804N

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Subtract 4110 from 6810 using 1's complement method. 2
- b) Convert the following binary numbers into octal and hexadecimal: 6
- i) (10100010)₂
- ii) (1110011)₂
- iii) (00111011)₂
- c) Explain all logic gates with truth tables. 8

OR

2. a) State De-Morgan's theorems. 4
- b) Find the complement of the function. 4
- i) $F_1 = X'YZ' + X'Y'Z$
- ii) $F_2 = X(Y'Z' + YZ)$
- c) Prove NAND gate is universal gate. 8
3. a) Minimize $ABC + AB'C + ABC' + A'BC$ using Karnaugh map. 4
- b) Simplify the logic expression. 6
- i) $X'Y + XY' + XY + X'Y'$
- ii) $X' + XY + XZ' + XY'Z'$
- c) Express the Boolean function $F = A + B'C$ in a sum of minterms. 6

OR

4. a) Draw and explain the operation of 4×1 multiplexer. 6
- b) Explain the operation of full-adder circuit with truth table using basic gates. 10

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| 5. | a) | Draw the logic diagram of J-K flip flop. | 4 |
| | b) | Explain the race around condition. | 4 |
| | c) | Explain the working of 4 bit ring counter. | 8 |

OR

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|----|----|------------------------------------------------------------|---|
| 6. | a) | Draw the symbols of edge triggered D and T flip-flops. | 4 |
| | b) | Explain the function of clocked D flip-flop. | 6 |
| | c) | Distinguish between synchronous and asynchronous counters. | 6 |
| 7. | a) | Write short note on 3 bit R – 2R ladder DAC. | 8 |
| | b) | Explain Dual slope A/D convertor. | 8 |

OR

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| 8. | | Write a note on. | 16 |
| | i) | Sample and hold circuit | |
| | ii) | Parallel comparator A/D convertor. | |
| | iii) | Successive approximation A/D convertor. | |
| | iv) | Quantization. | |
| 9. | a) | Explain the classification of memories in brief. | 4 |
| | b) | Differentiate RAM and ROM. | 6 |
| | c) | Write short note on PLA. | 6 |

OR

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| 10. | a) | Draw and explain basic structure of EPGA. | 6 |
| | b) | Design a PLA structure for following function. | 10 |
| | | $F1 = \sum m(0,1,2,3,4,7,8,11,12,15)$ | |
| | | $F2 = \sum m(2,3,6,7,8,9,12,13)$ | |
| | | $F3 = \sum m(1,3,7,8,11,12,15)$ | |
| | | $F4 = \sum m(0,1,4,8,11,12,15)$ | |
