

NTK/KW/15/7322

Faculty of Engineering & Technology  
Third Semester B.E. (Computer Technology)  
(C.B.S.) Examination  
**DIGITAL ELECTRONICS & MICROPROCESSOR**

Time : Three Hours]

[Maximum Marks : 80

**INSTRUCTIONS TO CANDIDATES**

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

1. (a) Simplify the following function :

(i)  $Y = \overline{(\overline{A + A + B})(\overline{B + B + C})}$

(ii)  $Y = A B \overline{C} + A \overline{B} \overline{C} + \overline{A} B C + A B C + A \overline{B} C$

7

(b) Solve the following :—

(i)  $(23)_{10} = (212)_x$ , find base x.

(ii)  $(9.25)_{10} = ( )_2 = ( )_8 = ( )_{16}$

6

**OR**

2. (a)  $F = ABC + B\bar{C}D + \bar{A}BC$   
 Given the logic equation  
 (i) Make a truth table  
 (ii) Simplify using K-MAP  
 (iii) Realize using NAND gates only. 8
- (b) Realize  $Y = A + B\bar{C}D$  using 2 input NAND gates only. 5
3. (a) Design BCD to Excess-3 code convertor using logic gates. 7
- (b) (i) Design a 8:3 encoder using logic gates.  
 (ii) Implement the following Boolean function using 3:8 decoder and gates :  
 $F_1(A, B, C) = \sum m(1, 3, 7)$   
 $F_2(A, B, C) = \sum m(0, 2, 4, 5, 6).$  7

**OR**

4. (a) Convert the following flip flops :  
 (i) JK to T  
 (ii) D to JK. 8
- (b) What is a latch and how a latch can be used as 1-bit memory cell ? 3
- (c) What is preset and clear input of a flip flop ? 3
5. (a) Design a MOD-6 counter using T flip flop. 7

- (b) Explain the difference between asynchronous and synchronous counter 3
- (c) Explain lock free counters and their needs. 3

**OR**

6. (a) Design full subtractor using two half subtractors and logic gate 7
- (b) Explain carry look ahead adder with suitable diagram. 6
7. (a) Explain various flags of 8085 with suitable example. 7
- (b) Explain the following pins :
- (i) ALE
- (ii) RESET IN
- (iii)  $\overline{IO/M}$
- (iv)  $\overline{SID}$  7

**OR**

8. (a) Explain the following instructions of 8085 :
- (i) STAX D
- (ii) XCHG
- (iii) XRA B
- (iv) MVI M, data. 8
- (b) What are the different registers of 8085 ? Discuss their functions. 6

9. (a) Explain the different addressing modes supported by 8085 with examples. 6
- (b) Draw the timing diagram of the following instruction :
- (i) LXI H, 7000 H
- (ii) LHLD 7000 H 7

**OR**

10. (a) Discuss in brief about assemblers and disassemblers. 6
- (b) Write an ALP to add two 16 bit data 7060 H and 8010 H. 4
- (c) What do you mean by sub-routine ? What are the advantages of using sub-routine ? 3
11. (a) If operating frequency = 1.728 MHz, write a delay programme for 100 ms. 6
- (b) Explain with examples the EI and DI instructions of 8085. How these instructions are generally used ? 7

**OR**

12. (a) Explain the SIM and RIM instructions. 6
- (b) Explain any three advanced instructions of  $\mu$ p 8085. 7