B. E.(with Credits)-Regular-Semester 2012-Electronics Engineering Sem. - IV

EN 402 Digital Circuits & Fundamentals of Microprocessor

P. Pages : 2

Time : Three Hours   Max. Marks : 80

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

1. a) Simplify the following using k-map.   **8**

    i) $f(A, B, C, D, E) = \Sigma m\,(0, 3, 4, 6, 8, 20, 21) + d\,(7, 9, 10, 25, 27, 31)$

    ii) $f(A, B, C, D,) = A\overline{B}CD + \overline{A}BC + AC\overline{D} + B\overline{C}\,\overline{D} + \overline{C}D$

  b) Design a BCD to excess-3 code converter. Assume 4-bit input arrive at its input terminal.   **8**

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

2. a) Design a combinational circuit that will accept 4-bits at binary and generate an output y. Y = 1 when inputs are even number and Y = 0 for otherwise.   **8**

  b) Draw the block diagram of full-adder with the help of truth table obtain the logic equations for each output of the full adder. Draw the logic diagram with the help of logic equations.   **8**

3. a) Design a combinational circuit for 2-bit magnitude comparator.   **8**

  b) With the help of suitable Multiplexer implement the following function $f(A, B, C, D,) = \Sigma m(0, 1, 3, 6, 8, 9, 11, 13)$ consider D as a input line and A, B and C as a selection lines to the MUX.   **8**

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

4. a) What is parity generator ? Design a 3-bit even parity generator and checker. **8**

b) Design a priority encoder such that D_1 having highest priority followed by D_0, D_2 and D_3. **8**

5. a) What is race around condition of the flip-flop? How will you overcome from this condition? Explain. **8**

b) Convert JK flip-flop to SR flip-flop. **8**

OR

6. Design a 3-bit Gray code up-down counter. Consider M as a control signal. If M = 1, counter acts as upcounter and if M = 0, counter acts as downcounter. **16**

7. a) Explain different addressing modes of microprocessor 8085A. Explain all with suitable example. **8**

b) Draw and explain the timing diagram of ADI 08H **8**

OR

8. a) Explain the flag register of μp 8085. With the aid of suitable example explain how the flip-flops of flag-register are set/reset. **8**

b) Explain the following instructions of μp 8085. **8**
   i) XCHG   ii) ANA. R
   iii) INX H   iv) MOV C, M.

9. a) Explain the interrupts of μp 8085 in detail. **8**

b) Explain the block diagram of 8255 PPI. **8**

OR

10. a) Write and explain the complete format of I/O mode of 8255 PPI and Hence write an assembly language program for the following. **8**
P_A as I/P port
P_B as O/P port with handshake
PC_U as O/P port
PC_L as I/P port

b) Write the format of BSR mode of 8255 PPI and Hence write an assembly language Program to blink LEDs on PC4 **8**

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