

335

Total No. of Questions: 09  
(Sem.-3<sup>RD</sup>)

**Subject Code: BTEC-302**

**Time: 3 Hrs.**

**Max. Marks: 60**

1. Section -A, is Compulsory.
2. Attempt any four questions from Section-B.
3. Attempt any two questions from Section-C.

Q1.

(10x2=20)

- a) If  $A = (1011)_2$ ,  $B = (1110)_2$ , find  $A-B$ .
- b) Convert  $Y = \sum m(1,3,5)$  into Standard SOP and POS form
- c) Implement half adder using NAND gates
- d) Compare synchronous counters and asynchronous counters.
- e) What is a Register? Give its different types.
- f) Define i) Noise Margin ii) Fan in.
- g) List various types of RAM and ROM.
- h) Which type of circuit is used for edge triggering? Give its arrangement for positive and negative triggering.
- i) A counter type A/D converter contains a 4 bit binary ladder and is driven by 2 MHz clock calculate conversion rate and resolution?
- j) Explain: PAL and PLA.

**(4x5=20)**

Q2. A combinational circuit has 3 inputs A,B and C and output F. F is true for following input combinations:

A is False and B is True; A is False and C is True; A, B, C are False; A, B, C are True.

- Write the Truth. Table for F
- Write the simplified expression for F in SOP form and POS form
- Draw the logic circuit using NOR gates.

- Q3. a) Implement  $Y(A,B,C,D) = \sum m(1,3,5,7,9,11,14)$  using 4:1 MUX.  
b) Design 4x16 decoder with 2x4 decoder.
- Q4. a) Convert SR to D flip flop  
b) Explain briefly how Race around condition in flip flop is avoided
- Q5. Discuss different specifications of A/D converter.
- Q6. What is a memory cell? Discuss different RAM cells and ROM cells.

**Section-C**

(10x2=20)

- Q7. Simplify the following functions using K map and implement the circuit using NAND gates only:
- (a)  $Y = \sum m(2,3,4,5,13,15) + \sum d(8,9,10,11)$   
(b)  $S = \sum m(1, 5, 7, 8, 9, 10, 11, 14, 15)$
- Q8. With neat diagram explain the working of  
a) 4 bit serial in serial out shift register  
b) 2 bit Asynchronous Ripple Up counter
- Q9. Discuss MOS logic family in brief.

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