

(4)

- (c) PROM
- (d) EPROM
- (e) EEPROM

Unit-IV

8. (a) What do you mean by shift register? Explain shift right register with the help of an example. 7½
- (b) Explain the working of clocked R-S flip-flop. 7½
9. (a) What is Counter? Explain Mod-9 Counter with the help of logic circuit and truth table. 7½
- (b) Explain the working of J-K flip-flop using logic diagram and truth table. 7½

A

(Printed Pages 4)

Roll. No. _____

SFS-4699

B.C.A. (Semester-II) Examination, 2015

Digital Electronics & Computer Organization

(BCA-S-107)

Time Allowed : Three Hours] [Maximum Marks : 100

Note : Answer five questions in all, selecting one question from each unit. Question No.1 is compulsory.

1. (a) Discuss Universal gates with logic diagram and truth table. 4 × 10 = 40
- (b) State and prove Demorgan's theorem.
- (c) Explain XOR gate and XNOR gate with circuit diagram and truth table
- (d) Draw the circuit diagram for the following expression :-
- $$Y = A\bar{B}C + \bar{A}B\bar{C} + \bar{A}\bar{B}C + ABC$$
- (e) Differentiate between sequential circuit and combinational Circuit with example.
- (f) Explain the working of half adder along with it's circuit diagram.

(2)

- (g) What do you mean by static RAM and dynamic RAM?
- (h) What do you mean by Cache memory? why is it needed?
- (i) What do you mean by flip-flop? differentiate between latch and flip+flop.
- (j) What do you mean by Associative memory?

Unit-I

- 2. (a) Prove the following using Boolean Laws:
 - (i) $(A+B).(A+C) = A+BC$ 7½
 - (ii) $(A+B).(A+B) = A$
- (b) Construct the following gates using NOR gate only : 7½
 - (i) AND gate
 - (ii) OR gate
 - (iii) NOT gate
 - (iv) XOR gate
 - (v) XNOR gate
- 3. Reduce the following expression using K-Mop: 15
 - (a) $F(A,B,C,D) = \sum m(0,2,3,4,5,6,7,8,10,11,15)$
 - (b) $F(A,B,C,D) = \sum m(1,2,3,6,9,12,14) +$
 $d(5,10,13,15)$
 - (c) $F(A,B,C,D) = \pi_m(0,1,4,5,9,11,12,13,15)$

(3)

Unit-II

- 4. (a) Convert the following Boolean expression into SOP form: 7½
 - (i) $(A+B+\bar{C}).(A+\bar{B}+C)$
 - (ii) $(\bar{A}+B+\bar{C}).(A+B+C).(\bar{A}+\bar{B}+\bar{C})$
 - (iii) $(\bar{A}+B+C+D).(\bar{A}+\bar{B}+C+D).(\bar{A}+B+C+\bar{D})$
- (b) What is multiplexer? Explain the circuit diagram and working of 8×1 multiplexer. 7½
- 5. (a) What is decoder? Explain the working of Octal-to-Binary decoder. 7½
- (b) Draw the circuit diagram of 2's complement adder/subtractor and explain how it can be used for both addition and subtraction. 7½

Unit-III

- 6. (a) Discuss the organization of magnetic disk. Explain how data is accessed from disk using read/write head. 7½
- (b) Explain the organization and data access mechanism of optical disk. 7½
- 7. Write short note on the following : $3 \times 5 = 15$
 - (a) RAM
 - (b) ROM