

**(4)**

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

**Unit-I V**

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.  $4 \times 10 = 40$
- (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 :-

$$Y = A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}\bar{B}C + ABC$$

- (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)  $F(A,B,C,D) = \Sigma m(0,2,3,4,5,6,7,8,10,11,15)$
  - (b)  $F(A,B,C,D) = \Sigma m(1,2,3,6,9,12,14) + d(5,10,13,15)$
  - (c)  $F(A,B,C,D) = \pi_m(0,1,4,5,9,11,12,13,15)$

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**(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  $8 \times 1$  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

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**P.T.O.**