

**S.D.E.**  
**M.C.A. SEM – I (CBCS – 2018 COURSE) : WINTER – 2018**  
**SUBJECT : COMPUTER ORGANIZATION & ARCHITECTURE**

Day : Thursday  
Date : 29/11/2018

**W-2018-4787**

Time : 10.00 AM TO 1.00 PM  
Max. Marks : 70

**N. B. :**

- 1) Attempt **Any FOUR** questions from **Section-I** and **Any TWO** questions from **Section-II**.
- 2) Answers to both the sections should be written in the **SEPARATE** answer book.
- 3) Figures to the right indicate **FULL** marks.

**SECTION-I**

- Q.1** Explain types of computers with their merits and demerits. (10)
- Q.2** Discuss working of half adder and full adder with the help of circuit diagram. (10)
- Q.3** What is decoder? Discuss 3 to 8 line decoder with circuit diagram and truth table. (10)
- Q.4** Explain instruction cycle with the help of flow chart. (10)
- Q.5** What is virtual memory? Discuss the method of translating virtual addresses to physical addresses. (10)
- Q.6** Explain the asynchronous data transfer with strobe control method. (10)
- Q.7** Write short notes on **Any TWO** of the following : (10)
- a) Firewall
  - b) Vector processing
  - c) Registers

**SECTION-II**

- Q.8** a) Simplify the following Boolean functions using K-map. (08)
- i)  $F(x,y,z) = \sum (0,2,3,4,6)$
  - ii)  $F(A,B,C,D) = \sum (0,2,4,5,6,7,8,10,13,15)$
- b) Simplify by using Boolean algebra. (07)
- i)  $A'B + ABC' + ABC$
  - ii)  $(BC' + A'D)(AB + CD')$
- Q.9** The sequential circuit has two D flip-flops A and B, one input x and one output y. The flip-flop input equations and circuit output are as follows. (15)
- $$D_A = x'A + A'B'$$
- $$D_B = x'B + xA$$
- $$y = xA + x'B$$
- i) Draw the logic diagram.
  - ii) Tabulate the state table.
  - iii) Draw the state diagram.
- Q.10** Draw the circuit diagram of 4 bit adder subtractor and explain its functioning. (15)

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