M.C.A. SEM - II (CHOICE BASED CREDIT SYSTEM 2011 & 2012 COURSE) : SUMMER - 2018

SUBJECT – COMPUTER ARCHITECTURE

Day: **Tuesday** | **S-2018-1787** | Time: **10.00 AM TO 01.00 PM**

Date: **24/04/2018** | Max. Marks: 100

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 books.
3) Figures to the **RIGHT** indicate full marks.

SECTION - I

Q.1 Describe the four segment CPU pipeline with the help of flowchart. **[15]**

Q.2 Discuss 4 bit bidirectional shift register with parallel load with the help of circuit diagram. **[15]**

Q.3 Discuss various interconnection structures to form a multiprocessor systems. **[15]**

Q.4 Draw the block diagram of DMA controller and explain how it is used for direct data transfer between memory and peripherals. **[15]**

Q.5 What is mean by virtual memory? Explain memory address translation with help of mapping table. **[15]**

Q.6 Write short notes on **ANY TWO** of the following: **[15]**

a) Addressing modes
b) Binary adder-subtractor
c) General register organization

SECTION – II

Q.7 **a)** Solve the following expression using stack: **[10]**

[(3+2+3)*(3+2)]* (3+7)

b) Solve the following.

i) Find 2's complement : 00101110 **[05]**
ii) 10100010 – 00111100 **[05]**

Q.8 **a)** Simplify the following expression using Boolean algebra.

i) A'BC+AB'C'+A'B'C'+AB'C+ABC **[05]**
ii) AB'+A(B'+C')+B (B'+C') **[05]**

b) Simplify using K map.

i) $F(X,Y,Z) = \sum (0,1,5,7)$ **[05]**
ii) $F(A,B,C,D) = \sum (0,1,2,4,5,7,11,15)$ **[05]**

Q.9 A sequential circuits has two D flip flop A & B, two inputs x & y and one output z. the flip flop input equation and circuit output are as follows: **[20]**

$D_A = xy + x'A$
$D_B = xB' + x'A$
$Z = xB$

1) Draw the logic diagram of the circuit.
2) Tabulate the state table.
3) Draw the state diagram.

* * * * *