Printed Pages: 02
Paper Id: 294230

Sub Code: RCAI202
Roll No. | | | | | | | | | | |

MCA (INT)
(SEM II) THEORY EXAMINATION 2018-19
COMPUTER ORGANIZATION

Time: 3 Hours *Total Marks: 70*

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

1. Attempt *all* questions in brief. **2 x 7 = 14**

a. How register and their bits are represented?
b. What do you understand by control function in register transfer?
c. Give major steps involved in execution of a simple instruction.
d. Discuss storage components of CPU.
e. What type of notation for the expressions is used by stack? Explain with the help of an example.
f. Give the procedure for a simple interrupt processing.
g. Discuss how cache memory works.

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a. Draw the block diagram for the hardware that implement the statement xy + z : A ← A + B where A and B are two n-bit registers and x, y, and z are control variables.
b. What do you mean by data path inside CPU? Construct single bus organization and input/output gating for it.
c. What are various types of stack organization? Discuss them for performing PUSH and POP operations.
d. What do you mean by interrupt handlers? Discus the various steps used in handling interrupts.
e. How the cache can be initialized? Discuss write-through and write-back approaches for writing into cache.

SECTION C

3. Attempt any *one* part of the following: **7 x 1 = 7**

(a) What are the various ways to represent bus transfer in RTL? Discuss memory read and memory write operation.
(b) Discuss various operations performed by four bit arithmetic circuit.

4. Attempt any *one* part of the following: **7 x 1 = 7**

(a) What is the role of generate and propagate function in the designing of the fast adder? Design the fast adder circuit using them.
(b) How the hardwired control unit can be organized and how decoding/encoding functions can be separated in this organization? Discuss.

5. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) With the help of diagram discuss Booth multiplication algorithm and multiply (+11) and (-21) using it.

(b) If a two word instruction is start at a memory location 200 and its address 500 is stored at location 201. If the contents at location 400 is 700, 500 is 800, 600 is 900, 702 is 325, and 800 is 300 and a processor register R has the value 400. Evaluate the effective address and the contents of AC if the addressing modes are immediate, direct, indirect, register, register indirect, relative and indexed.

6. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) What are the major types of CPU organizations? Give 0, 1, 2, and 3 address instructions for the expression X := A-B*C/D.

(b) Discuss various computer buses used to communicate with memory and I/O.

7. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) How the various types of memories can be arranged? Discuss memory hierarchy in detail.

(b) What do you mean by virtual memory? Explain address mapping can be established.