2018

MCA 2nd Semester Examination

COMPUTER ARCHITECTURE & ORGANIZATION

PAPER—MCA-203

Subject Code—32

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer Q. No. 1 and any *five* from the rest.

1. Answer any *five* questions : 5×2

(a) What is an instruction cycle ?

(b) What is meant by Bid-Endian and Little Endian ?

(c) What are the registers generally contained in the processor ?

(d) Define interrupt.

(e) How does selective set operation work ?

(f) Represent the number $(+46.5)_{10}$ as a floating point binary number with 24 bits. The normalized fraction mantissa has 16 bits and the exponent has 8 bits.

(g) Draw a circuit to check odd parity.

2. (a) Explain with the block diagram the DMA transfer in a computer system.

(b) How data transfers can be controlled using handshake techniques ? 6+6

3. (a) Explain various addressing modes found in modern processors.

(b) What are the factors go into determining the use of the addressing bits of instruction ? 8+4

4. (a) Differentiate between microprogrammed and hardwired control unit.

(b) What are microoperations ? List out the truth table for logic operation performed with two variables.

6+(2+4)

5. (a) Briefly explain 4-bit arithmetic circuit with a block diagram.

(b) Discuss an interrupt cycle with the help of flowchart.

6+6

6. (a) Draw a timing diagram assuming that a sequence counter (SC) is cleared to 0 at time T_3 if control signal C_7 is active. C_7 is activated with the positive clock transition associated with T_1.

$$C_7T_3 : SC \leftarrow 0$$

(b) Draw a bus organization with seven CPU registers and explain the working of control word with the help of an example.

(c) State some characteristics of RISC. 3+7+2

7. (a) Briefly explain the addition and subtraction in signed magnitude form.

   (b) What is strobe ? How does source initiated strobe for data transfer works ? 7+5

8. (a) What is stack ? Discuss memory stack organization.

   (b) Write short notes on : (any *two*)

   (i) Associate Mapping ;

   (ii) Daisy chaining Priority ;

   (iii) Cache Memory. 4+8

[Internal Assessment : 30 Marks]