MCA 2nd Semester Examination, 2016

COMPUTER ARCHITECTURE

PAPER—MCA - 203

Full Marks : 100

Time : 3 hours

Answer Q.No 1 and any five from the rest

The figures in the right-hand margin indicate marks

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

Illustrate the answers wherever necessary

1. Answer any five questions :   2 × 5

   (a) How many 128 × 8 memory chips are needed to provide a memory capacity of 4096 × 16 ?

   (b) Obtain the 9's complement of the following eight-digit decimal numbers :

        12345698 and 00980100

(c) Why does DMA have priority over the CPU when both request a memory transfer ?

(d) What is temporal locality ?

(e) Define parallel processing.

(f) How overflow is detected in fixed-point arithmetic ?

(g) What is content addressable memory ?

2. (a) What are the different types of CPU organization ? Explain with an example.

(b) List the algorithm to perform PUSH and POP operation in a stack.   6 + 6

3. (a) Draw a circuit for Odd parity generator and explain with truth table.

(b) Briefly explain, how does an interrupt is handled in a basic computer system.   6 + 6

4. With flowchart and numerical example, explain Booth's multiplication algorithm.   12

5. (a) What are handshaking signals ? Explain asynchronous data transfer using handshake signals.

   (b) Briefly explain various addressing modes.

                                                      7 + 5

6. (a) Define cache memory. Explain various cache mapping mechanism with neat block diagram.

   (b) What are the disadvantages of strobe.

                                              (2 + 8) + 2

7. Explain general register organization in CPU with block diagram. Also, state how does control word operate within the above organization.   12

8. (a) Discuss the working principle of 4-bit Arithmetic circuit.

   (b) With block diagrams, explain data transfer using DMA controller.   6 + 6

[*Internal Assessment* : 30 Marks]

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