

3 (Sem-3) CSC M 2

2 0 1 7

COMPUTER SCIENCE

(Major)

Paper : 3-2

(Computer Organization and Architecture)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Answer the following as directed : $1 \times 7 = 7$

**(a) Floating-point number is represented in
the form of $m \times r^e$.**

(State True or False)

(b) $P:R_2 \leftarrow R_1$ means

**(i) transfer the data from register R_1 to
 R_2 , when control variable P is 1**

**(ii) transfer the data from register R_1 to
 R_2 , when control variable P is 0**

**(iii) transfer the data from register R_2 to
 R_1 , when control variable P is 1**

(Choose the correct option)

(2)

(c) An arithmetic shift left divides a signed binary number by 2.

(State True or False)

(d) Register IR represents

(i) Intermediate Register

(ii) Instruction Register

(iii) Input Register

(Choose the correct option)

(e) A sequence of microoperations constitutes a _____.

(Fill in the blank)

(f) The execution of an instruction consists of _____ cycle and _____ cycle.

(Fill in the blanks)

(g) The binary conversion of $(12.25)_{10}$ is _____.

(Fill in the blank)

2. Answer the following questions : $2 \times 4 = 8$

(a) Perform the arithmetic operation '-14 - (+6)' in binary using signed 2's complement representation.

(b) Write down the purposes of the following :

(i) PC

(ii) AC

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(Continued)

(3)

(c) What is associative memory?

(d) Write briefly about the instruction code format.

3. Answer any *three* of the following questions :

$5 \times 3 = 15$

(a) Consider a system of four registers each of four bits. Design a circuit for common bus system for the four registers.

(b) What is microprogrammed control unit? How is it different from hardwired control unit?

(c) What is an interrupt? How are multiple interrupts handled?

(d) What is microprogram? Give an example.

(e) What is stack? Explain its operations.

4. Answer any *three* of the following questions :

$10 \times 3 = 30$

(a) Draw a 4-bit arithmetic circuit that performs the basic arithmetic operations. Write the function table for the arithmetic circuit.

(b) Describe the design procedure of an accumulator.

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(Turn Over)

(4)

- (c) Explain register addressing mode and indirect address mode with zero-, one-, two- and three- address instruction examples in each addressing mode.
- (d) Explain any two mapping procedures of cache memory.
- (e) What is DMA? What is cycle stealing in DMA? Explain different signals associated with DMA controller.
