

CS/BCA(H)/Even/2nd Sem/BCA-201/2014

2014

Computer Architecture and System Software

Time Alloted : 3 Hours

Full Marks : 70

**The figure in the margin indicate full marks.
Candidates are required to give their answers in their
own words as far as practicable**

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following:

10x1=10

**i) The contents of a Base Register may be changed in
_____ mode.**

- a) User b) Privileged
c) Safe d) None of the above**

ii) An arithmetic left shift

- a) Multiplies a signed number by 2
b) Divides a signed number by 2
c) Multiplies a signed number by 4
d) Divides a signed number by 4**

**iii) Number of address lines required for access of 1MB
memory is**

- a) 17 b) 18 c) 19 d) 20**

iv) A _____ is a complete CPU on a single chip.

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[Turn over]

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- a) Microprocessor b) Micro-controller
- c) Control Unit d) ALU
- v) 8085 has a total of _____ registers.
 - a) 10 b) 11 c) 12 d) 13
- vi) ADD is a _____ address instruction.
 - a) Zero b) One c) Two d) Three
- vii) The 8085 instruction to transfer a data to a register in immediate mode is _____
 - a) MOV b) MVI
 - c) LOAD d) None of these
- viii) _____ calculates the address of the next microinstruction to be executed.
 - a) Program Counter
 - b) Address computation circuit
 - c) Instruction register
 - d) None of these
- ix) The minimum time elapsed between two read requests is called
 - a) Access time b) Cycle time
 - c) Turnaround time d) Waiting time
- x) Division by zero causes an error of class
 - a) Trap b) Timer Interrupt
 - c) I/O interrupt d) Hardware failure

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following.

3x5=15

- 2. Draw a 4 - bit Adder - subtractor circuit and explain its function. 5
- 3. Draw and explain the common bus system for 4 registers using 4 x 1 MUX. 5

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4. What are Direct and Indirect address? Explain with example. 5
5. Make a list of registers for the basic computer, indicating the function of each register. 5
6. What is Instruction cycle? What are the different phases of this cycle. 2+3
7. Write an Assembly language program to add two numbers. 5

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following.

3x15=45

8. a) What will be the content of the Program Counter after fetching 8bit/ 16bit data from a memory location 3065H. The instruction to fetch the data resides at 5132H. Assume the instruction length to be 3 bytes.
- b) Why are interrupts considered to be a useful mechanism in the context of improving the efficiency of processing?
- c) What are the steps for a simple instruction cycle? Explain Fetch Cycle and Indirect Cycle using Register Transfer Language. 2+3+(2+8)
9. Draw and explain one stage of an ALU with shift capability along with the micro-operations performed. [15]
10. a) What do you mean by packing? Given two decimal digits 5 and 9, show the packing procedure through proper steps.
- b) What is an Instruction Set?
- c) Convert the following expression into Reverse Polish Notation

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and show the evaluation procedure in the stack organized CPU:

$A \times B + C \times (D + E)$

(2+5)+2+6

11. a) Explain the Programmed Input/Output with a flow chart. 8

b) Draw the logic diagram of a binary cell and explain its working.

8+7

12. Write short notes on any three of the following:

5x3 = 15

a) Cache Memory

b) Arithmetic Pipelining

c) Program Counter

d) RIM and SIM instructions

e) Flag Register in 8085

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