SE433

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S.E. (Information Technology) (Sem-IV) (Revised Course 2016-2017)
EXAMINATION NOV/DEC2019
Computer Organization and Architecture

[Duration : Three Hours] **[Total Marks : 100]**

Instructions:
1) Answer **any 5** questions with at least **two** from Part-A, **two** from Part-B and **one** from Part-C.
2) Make **necessary** assumptions **wherever** required.
3) Draw **neatly** labelled diagrams **wherever** necessary.

Part- A

Q.1
a) Draw the top level view of computer components and explain. **4**
b) With a neat state diagram, explain instruction cycle with interrupts. **8**
c) Draw the flow chart for Booth's algorithm for two's compliment multiplication and solve for (5X4). **8**

Q.2
a) Describe the following **6**
i) Amdahl's law ii) Exponent overflow and underflow.
b) Draw the flowchart for the division of signed magnitude (restoring method) with e.g. **6**
c) Show how the typical direct mapping carried out with your own example in cache organization. **8**

Q.3
a) Compare the Memory cell structure of DRAM and SRAM. **8**
b) Explain the optical CD-ROM disk with a neat sketch. **6**
c) Show detail step-by-step Cache Read & Write operations with a suitable example. **6**

Part- B

Q.4
a) Explain the functions of I/O Module. **6**
b) List and explain functions of DMA with a neat block diagram. **8**
c) Differentiate between I/O channel and I/O Processor. **6**

Q.5
a) Explain various types of user visible registers. **6**
b) List the Characteristics of Large Register file and Cache Organization. **6**
c) Assume a pipeline with six stages: **8**

Fetch Instruction (FI),	Decode Instructions (DI),	Calculate operands (CO),
Fetch Operand (FO),	Execute(EX) and Write,	Operands(WO).

Draw a diagram for a sequence of 7-Instructions, in which the third Instruction is a branch that is taken to Instruction 15 where there is no data dependencies.

Q.6
a) Define micro operations. Explain and write micro operations for fetch cycle. **7**
b) Give instruction format for horizontal and vertical microinstructions. **5**

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c) Explain two address sequencing Technique for microinstructions. **8**

Part- C

Q.7

a) Given z=(A-B)/(X+D), solve the equation using 1-address, 2-address and 0-address instruction format. **6**

b) List and Discuss features of various semiconductor memories. **6**

c) Describe the working of programmed I/O with flowchart. **8**

Q.8

a) Write a note on micro instruction Encoding. **7**

b) Write the memory address map for the microprocessor, for memory size, 1K ×8. **5**

c) Show the hardwired implementation of control unit logic. **8**

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