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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

SEM: I - CARRY OVER THEORY EXAMINATION - AUGUST 2022

Subject: Computer System Organization

Time: 3 Hours

Max. Marks: 100

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 marks each.
3. Section B - Question No-3 is based on external choice carrying 6 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 10 marks each.
5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A

20

1. Attempt all parts:-

- 1-a. Which of the following logic operations produce a 0 if the inputs are 1,1 and 0? (CO1) 1
- (a) OR
 - (b) AND
 - (c) Exclusive OR
 - (d) Exclusive NOR
- 1-b. Which of the following is not a register? (CO1) 1
- (a) Accumulator
 - (b) Stack pointer
 - (c) Program Counter
 - (d) Buffer
- 1-c. The symbolic notation used to describe the microoperation transfers among registers is called (CO2) 1
- (a) Primary language
 - (b) Secondary language
 - (c) Register transfer language

(d) Program transfer language

- 1-d. How many multiplexers are needed to construct a bus system for 16 registers of 32 bits each? (CO2) 1
- (a) 4
 - (b) 16
 - (c) 32
 - (d) 64
- 1-e. Which of the following is a three address instruction? (CO3) 1
- (a) ADD R₁, R₂, R₃
 - (b) ADD R₁, R₂
 - (c) ADD R₁, X
 - (d) PUSH
- 1-f. In this addressing mode the operands are specified implicitly in the definition of the instruction (CO3) 1
- (a) Implied mode
 - (b) Immediate mode
 - (c) Register mode
 - (d) Direct address mode
- 1-g. The three main components of a digital computer system are (CO4) 1
- (a) memory, I/O, DMA
 - (b) ALU, CPU, MEMORY
 - (c) MEMORY, CPU, I/O
 - (d) Control circuits, ALU, registers
- 1-h. Which of the following is volatile? (CO4) 1
- (a) Bubble memory
 - (b) RAM
 - (c) ROM
 - (d) Magnetic disk
- 1-i. A block sequence consisting of a number of memory words is transferred in a continuous burst is called (CO5) 1
- (a) Cycle stealing
 - (b) Burst transfer

- (c) DMA controller
- (d) Access controller

- 1-j. Which of the following statement is true about DMA Controller? (CO5) 1
- (a) For each word that is transferred, the DMA increments its address register and decrements its word count register
 - (b) For each word that is transferred, the DMA decrements its address register and word count register
 - (c) For each word that is transferred, the DMA increments its address register and word count register
 - (d) For each word that is transferred, the DMA decrements its address register and increments its word count register

2. Attempt all parts:-

- 2.a. Draw the basic functional units of a computer. (CO1) 2
- 2.b. Specify two methods to construct the common bus in short. (CO2) 2
- 2.c. Write down the operation of a control unit? (CO3) 2
- 2.d. Give classification of memory. (CO4) 2
- 2.e. Define the role of address register in DMA controller. (CO5) 2

SECTION B 30

3. Answer any five of the following:-

- 3-a. Describe about the hardware implementation of Booth's multiplication algorithm. (CO1) 6
- 3-b. Make a neat flowchart of addition and subtraction process floating point numbers and explain. (CO1) 6
- 3-c. Specify all possible logic microoperations using two variables. (CO2) 6
- 3-d. Design a bus line with three state buffers and explain its functionality. (CO2) 6
- 3.e. What are the differences between hardwired and micro programmed control units? (CO3) 6
- 3.f. List the difference between static RAM and dynamic RAM. (CO4) 6
- 3.g. Make a block diagram of a computer with I/O processor and explain. (CO5) 6

SECTION C 50

4. Answer any one of the following:-

- 4-a. Explain all logic gates with symbol, algebraic expression and truth table. (CO1) 10
- 4-b. Describe step by step procedure for BCD addition using a suitable example, also clearly mention what we do when addition of two numbers value is more than 9. (CO1) 10

5. Answer any one of the following:-

5-a. A digital computer has a common bus system for 16 registers of 32 bits each. The bus is constructed with multiplexers? (CO2) 10

A. How many multiplexers are there in the bus.

B. What size of multiplexers are needed, also tell about selection line

5-b. Draw the block diagram for fixed point addition and subtraction and explain its working with help of an example (CO2) 10

6. Answer any one of the following:-

6-a. Define all Addressing modes using suitable example. (CO3) 10

6-b. Give the difference between RISC and CISC. (CO3) 10

7. Answer any one of the following:-

7-a. Define set associative cache mapping using suitable example. (CO4) 10

7-b. Discuss the different mapping techniques used in cache memories and their relative merits and demerits. (CO4) 10

8. Answer any one of the following:-

8-a. Elaborate the activities done by I/O processor using suitable diagram. (CO5) 10

8-b. With the help of diagram shows that how the source initiated transfer is done under handshaking and explain about the sequence of events. (CO5) 10