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Subject Code:- ACSAI0302

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - CARRY OVER THEORY EXAMINATION - APRIL 2023

Subject: Logic Design and Computer Architecture

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C.** It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. 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. According to boolean law: $A+1 = ?$ (CO1) 1
- (a) A
- (b) 1
- (c) 0
- (d) None
- 1-b. The expression $A(A+B) = ?$ (CO1) 1
- (a) AB
- (b) 1
- (c) $1+AB$
- (d) A
- 1-c. Which flag indicates the number of 1 bit that results from an operation?(CO2) 1
- (a) Zero
- (b) Parity
- (c) Auxiliary

- (d) Carry
- 1-d. Which method/s of representation of numbers occupies a large amount of memory than others?(CO2) 1
- (a) Sign-magnitude
 - (b) 1's complement
 - (c) 2's complement
 - (d) 1's & 2's compliment
- 1-e. Two important fields of an instruction are _____ & _____.(CO3) 1
- (a) Opcode
 - (b) Operand
 - (c) mode
 - (d) Both 1 & 2
- 1-f. _____ instruction has been used mostly to designate a transfer from memory to a processor register, usually an accumulator.(CO3) 1
- (a) Store
 - (b) Load
 - (c) Move
 - (d) Exchange
- 1-g. The BOOT sector files of the system are stored in _____.(CO4) 1
- (a) hard disk
 - (b) ROM
 - (c) RAM
 - (d) Fast solid state chips in the motherboard
- 1-h. When power is switched off which memory does not lose its data?(CO4) 1
- (a) Non-Volatile Memory
 - (b) Volatile Memory
 - (c) Both A and B
 - (d) None of the above
- 1-i. Instructions that are read from memory by an IOP are sometimes called _____, to distinguish them from instructions that are read by the CPU.(CO5) 1
- (a) Commands
 - (b) Instructions
 - (c) Program

(d) Subroutine

- 1-j. Chain printer is a ____ printer.(CO5) 1
- (a) line
- (b) daisy wheel
- (c) dot matrix
- (d) None of the mentioned

2. Attempt all parts:-

- 2.a. How Computer Architecture different from a Computer Organization?(CO1) 2
- 2.b. Explain two disadvantages of half adder.(CO2) 2
- 2.c. What are the steps involved in instruction cycle?(CO3) 2
- 2.d. What is Semiconductor Memories?(CO4) 2
- 2.e. Explain Daisy Chaining method of establishing priority with diagram.(CO5) 2

SECTION B

30

3. Answer any five of the following:-

- 3-a. What is Memory? Differentiate between RAM and ROM.(CO1) 6
- 3-b. Explain General register organization and Stack organization.(CO1) 6
- 3-c. Calculate the shr R1, shr R2 when R1=101010 & R2=010101.(CO2) 6
- 3-d. Explain IEEE standard for Floating Point Numbers.(CO2) 6
- 3.e. Explain addressing modes with suitable example.(CO3) 6
- 3.f. What is Cache Memory and explain its design issues.(CO4) 6
- 3.g. Write the difference between serial and parallel communication.(CO5) 6

SECTION C

50

4. Answer any one of the following:-

- 4-a. Explain basic functional units of a computer with interconnection.(CO1) 10
- 4-b. What is Bus Arbitration. With proper diagram explain the types of Bus Arbitration.(CO1) 10

5. Answer any one of the following:-

- 5-a. Explain carry look ahead adder with proper diagram.(CO2) 10
- 5-b. Explain Booth's algorithm step wise with the help of suitable example.(CO2) 10

6. Answer any one of the following:-

- 6-a. Explain Pipelining and differentiate between RISC and CISC.(CO3) 10
- 6-b. Explain Hardwire and Microprogrammed control with suitable diagram .(CO3) 10

7. Answer any one of the following:-

- 7-a. Explain 2D and 2.5D memory organization with diagram. Differentiate between ROM and RAM.(CO4) 10
- 7-b. With proper diagram explain Memory Hierarchy and Define Auxiliary Memory.(CO4) 10

8. Answer any one of the following:-

- 8-a. Differentiate between synchronous and asynchronous data transfer.(CO5) 10
- 8-b. Explain DMA and its working with proper diagram (CO5) 10

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