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TCS–404

B. TECH. (CSE)

(FOURTH SEMESTER)

MID SEMESTER EXAMINATION, 2021

COMPUTER ORGANIZATION

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) (i) Draw and explain basic structure of CPU.

(ii) Explain The Evolution of the Intel x86 Architecture. 10 Marks (CO1)

OR

(b) (i) What do you mean by Moore's Law ? Explain the types of computer. Explain with diagram where needed.

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(ii) Explain Von Neumann and Non Von Neumann Model in detail.

10 Marks (CO1)

2. (a) (i) Multiply (+8) and (–5) using Booth's Algorithm.

(ii) What do you understand by Error detection and find the fixed point representation of

$(10000000010101110100000000110)_2$

10 Marks (CO2)

OR

(b) (i) Considering the IEEE-754 32-bit floating point notation decipher its Decimal equivalent for the following given binary number :

00100010101101101011000000000110

(ii) Find the subtraction of (+ 36) – (–10).

10 Marks (CO2)

3. (a) (i) What do you understand by parity bit and overflow ?

(ii) Draw the flow chart of address sequencing in Micro-programmed CU.

10 Marks (CO3)

OR

(b) (i) An Instruction is stored at location 400 with its address field at location 401. The address field has the value 500. A processor register has the value 200. Evaluate effective address if the addressing mode of the Instruction is :

(I) direct

(II) immediate

(III) relative

(ii) The CPU has a control system which is called CU. Instructions are passed into the CU. Explain the memory reference instruction set along with the format. 10 Marks (CO3)

4. (a) (i) What are the various addressing modes ? Explain them with diagram.

(ii) The system uses a control memory of 1024 words of 32 bits each. The micro-instruction has three fields. The micro-op field has 16 bits :

(I) How many bits are there in branch address field and the select field ?

(II) If there are 16 status bit in the system, how many bits of the branch logic are used to select a status bit ?

10 Marks (CO2)

OR

(b) (i) What is the difference between the Hardwired Control Unit and the Micro-programmed Control Unit ?

(ii) What are Shift Micro operations ? Starting from initial value of R = 110010100 determine the sequence of binary values in R after a Logical shift left, followed by a circular shift right, followed by an arithmetic shift right and circular shift right. 10 Marks (CO2)

5. (a) Explain the concept of computer instruction and instruction cycle with the help of block diagram. 10 Marks (CO3)

OR

(b) Explain with diagram the bus structure in the microprocessor. 10 Marks (CO3)