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B. Tech
(SEM IV) THEORY EXAMINATION 2017-18
COMPUTER ORGANIZATION

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. Classify various registers in Computer Organization.
b. Explain floating point representation for binary numbers.
c. Define hardwired control with diagram.
d. Define Bus system? Explain the architecture of Bus system.
e. What is indirect addressing mode?
f. What are different micro- operations? Write their names also.
g. Write the function of Registers: (i) PC (ii) IR (iii) MAR (iv) MDR
h. What is peripheral device? Give the example of peripheral devices.
i. What is general register organization?
j. What are the different auxiliary memories?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Explain the various addressing modes with diagram.
b. What is the difference between hardwired control and micro-programmed control unit? What are the advantages and disadvantages in each control?
c. What do you mean by high –speed adder? Discuss design of higher speed adders.
d. Explain memory hierarchy with diagram.
e. Explain IEEE standard for floating point representation.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) Represent $(-307.1875)_{10}$ in single precision and double precision format.
(b) What is the difference between isolated I/O and memory-mapped I/O? What are the advantages and disadvantages of each?

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Discuss the advantages and disadvantages of Polling and daisy chaining bus arbitration schemes.
(b) Describe in detail about programmed Input/output with neat diagram.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) A bit computer has 16-bit address bus. the first 15 lines of the address are used to select a bank of 32k bytes of memory. the higher order bit of the address is

used to select a register which receives the contents of the data bus. explain how this configuration can be used to extend the memory capacity of the system to eight banks of 32k bytes each, for a total of 256 bytes of memory.

(b) What do you mean by processor organization? Explain various types of processor organization

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) Why DMA is required? Explain its functions with the help of block diagram.

(b) What is role of cache memory? Explain different cache mapping schemes.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) Write a program to evaluate arithmetic expression X= (A-B) * (((C-D * E) /F) G)

(i) Using a general register computer with three address instructions.
(ii) Using a general register computer with two address instructions.
(iii) Using a general register computer with one address instructions.
(iv) Using a general register computer with zero address instructions.

(b) Show the step by step multiplication process of (15) * (-13) using Booth's Algorithm.