

Roll No.

510701

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B. Tech. V - Sem. (Main) Exam., December - 2020
Electronics & Communication Engineering
SEC3 - 01 Computer Architecture

Time: 2 Hours

Maximum Marks: 80
 Min. Passing Marks:

Instructions to Candidates:

Part - A: Short answer questions (up to 25 words) 5×2 marks = 10 marks.
 All five questions are compulsory.

Part - B: Analytical/Problem solving questions 4×10 marks = 40 marks.
 Candidates have to answer four questions out of six.

Part - C: Descriptive/Analytical/Problem Solving questions 2×15 marks = 30 marks.
 Candidates have to answer two questions out of three.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
 (Mentioned in form No. 205)

1. NIL

2. NIL

PART - A

- Q.1 What is locality of reference? [2]
- Q.2 What is the purpose of guard bits used in floating point arithmetic? [2]
- Q.3 Define throughput and bandwidth. [2]
- Q.4 Why programme controlled I/O is unsuitable for high-speed data transfer? [2]
- Q.5 What are the two types of latencies associated with storage? [2]

PART - B

- Q.1 State and explain the different types of Hazards that can occur in Pipeline. [10]
- Q.2 Explain the concept of Main memory. Also differentiate between Static and Dynamic RAM. [10]
- Q.3 What are Computer Instructions? Explain design of a basic computer. [10]
- Q.4 Explain the difference between Hardwired control and Micro-programmed control. Is it possible to have a hardwired control associated with the control memory? [10]
- Q.5 Multiply the following signed numbers using Booth Algorithm-
- $A = (-34)_{10} = (1011110)_2$
- $B = (22)_{10} = (0010110)_2$
- Where B is multiplicand and A is multiplier. [10]
- Q.6 (a) Design a 4 bit adder/subtractor circuit using full adders and explain its functions. [5]
- (b) Define a Stack. How can it be implemented? Give one example for use of stack. [5]

PART - C

- Q.1 Define Virtual Memory. A virtual memory system has a page size of 1K Words. There are eight pages and four blocks. The associative memory page table contains the following entries:
- | | | | | |
|--------|---|---|---|---|
| Page: | 0 | 1 | 4 | 6 |
| Block: | 3 | 1 | 2 | 0 |
- Make a list of all virtual addresses in decimal that will cause a page fault if used by CPU. [15]
- Q.2 What do you mean by Addressing modes? Explain various addressing mode with the help of examples. Also explain the design of ALU in detail. [15]
- Q.3 What is DMA? Explain the block diagram of DMA. Also describe how DMA is used to transfer data from peripherals. [15]