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BIELE-015

B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

00604

Term-End Examination

December, 2017

BIELE-015 : COMPUTER ARCHITECTURE

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Missing data may be suitably assumed and mentioned. Use of scientific calculator is permitted.*

1. Draw the block diagram of computer architecture and explain each block separately. *4+6=10*

2. Write a program to evaluate an arithmetic expression : X = (A + B) * (C + D) using $4 \times 2\frac{1}{2} = 10$

   (a) Three-address instruction

   (b) Two-address instruction

   (c) One-address instruction

   (d) Zero-address instruction

3. (a) What is the difference between Hardwired control and Microprogrammed control ? *6*

(b) What are the advantages and disadvantages of each of the above two controls ? *4*

4. Explain the basic difference between a Branch instruction, a Call subroutine instruction and a Program interrupt. *10*

5. What are Semiconductor RAM memories ? Show the Read operation in a semiconductor RAM memory and write its operation in static memories with examples. *4+6=10*

6. (a) Why is the memory system of a computer organized as a hierarchy ? *5*

(b) Discuss the basic elements of a memory hierarchy. *5*

7. Define Interrupt. When a device interrupt occurs, how does the processor determine which device has issued the interrupt ? *3+7=10*

8. A system uses a control memory of 1024 words of 32 bits each. The micro-instruction has three fields : select, address and micro-operations fields. The micro-operations field has 16 bits.

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

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

   (c) How many bits are left to select an input for the multiplexers ? *4+4+2=10*

9. (a) Discuss the drawbacks of programmed and interrupt-driven I/O. *5*

   (b) Compare programmed I/O and interrupt-initiated I/O. *5*

10. Write short notes on any ***two*** of the following : *2×5=10*

   (a) Direct Memory Access (DMA)

   (b) Microcode

   (c) Virtual Memory