B.E. (Computer Science & Engineering) (New) Third Semester (C.B.S.)

Computer Architecture & Organization

P. Pages : 2 **NRT/KS/19/3326**

Time : Three Hours * 0 1 9 2 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.

1. a) What is bus ? Explain in detail about Single Bus Architecture. **8**

b) Explain Different instruction format and write the following instruction into zero, one and two address instruction $(A \times B) + (C + D)$. **6**

OR

2. a) Explain various addressing modes with example which are used in instruction set design. **7**

b) What is sub routine ? Explain the use of stack in nested subroutine. **7**

3. a) Represent : **8**
i) -450.725
ii) -0.000138
iii) 8.2489
In single and double precision IEEE format.

b) Solve the following by using Booth's algorithm **6**
$47 * -3$.

OR

4. a) Write and explain about fast adder. **6**

b) Using restoring division solve the following **8**
11011 DIV 00111

5. a) Design 8 m x 64 RAM by using 512 K x 8 memory chips. **8**

b) Explain memory Hierarch in detail. **5**

OR

6. a) Find page hit and page fault ratio for the given page address stream using - **7**
i) Least recently used ii) Optimal page
Assume four page buffers, page address stream $\rightarrow$ 2, 3, 2, 1, 5, 2, 4, 5, 3, 2, 5, 2.

b) A block set associative cache consist of a total 64 blocks. The main memory contains 4096 blocks. Each set consist of 128 block. Each set consist of 4 block. **6**
   i) How many bits are there in a main memory address.
   ii) How many bits are there in each of TAG, SET and WORD fields.

7. a) Write a short note on Direct memory access of data transfer. **7**

b) Explain I/O mapped I/O and memory mapped I/O. State the advantages of I/O mapped I/O over memory mapped I/O. **6**

OR

8. a) Write a short note on Daisychain scheme of resolving interrupt priority. **6**

b) Explain the working principle of CD-ROM and organisation of data on CD-ROM. **7**

9. a) What do you mean by Hazard ? Explain Different types of Hazard in detail. **8**

b) Write a short note on delayed branch. **5**

OR

10. a) Explain in detail about operand forwarding in pipeline. **7**

b) Explain the concept of pipelining. How it improve the execution of program over sequential execution ? Also draw the hardware arrangement of four stage pipeline. **6**

11. a) Explain the classification of parallel architecture. **8**

b) Write a short note on Array Processor. **5**

OR

12. a) What is multicore architecture ? Explain in detail. **6**

b) Write a short note on : **7**

   i) Vector Processor.

   ii) Loosely and tightly coupled multicomputer system.

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