B.E.(Information Technology) Fourth Semester (C.B.S.)

Computer Architecture & Organization Paper – IV

P. Pages : 2 **TKN/KS/16/7389**

Time : Three Hours * 0 7 8 8 * Max. Marks : 80

Notes : 1. All questions carry marks as indicted.
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) Explain functional units of a basic computer system. **6**

b) Differentiate between the big endian assignment and little - endian assignment. **4**

c) Explain the difference between multiprocessor and multicomputers. **4**

OR

2. a) Explain straight line sequencing in detail. What is the function of MAR, MDR, ALU? **7**

b) Explain 3-address, 2-address, 1- address and zero address instruction formats. Why there is a need of small length instructions. **7**

3. a) Explain the role of stack in subroutine call implementation with example. **6**

b) Explain execution of complete instruction using three bus architecture. **7**

OR

4. a) Enlist and explain with example the different addressing modes of 68000 processor. **8**

b) Explain single bus organization of a data path of a processor with block diagram. **5**

5. a) Explain the function of microprogram control unit. **6**

b) Explain the difference between Hardwired and microprogrammed control unit. **4**

c) List out the application of microprogramming. **3**

OR

6. a) Why control signals are needed in a CPU to execute an instruction? write a control signal generation for ADD R0, R1 where result is stored in R0. **7**

b) What is horizontal and vertical μ-instruction format? Explain grouping of control signals with a suitable example. **6**

7. a) Why 2's compliment number representation is used over other methods of negative number representation? **3**

b) Explain the design of fast address. **5**

c) Write short note on how arithmetic operations are performed in floating point numbers. **5**

OR

8. a) Multiply the following pair of signed 2's complement number using Booths multiplication and bit pair recording technique. **8**
A = 010111, B = 110110
Where A is multiplicand & B is multiplier

b) Solve 1010 DIV 0101 using non restoring division algorithm. **5**

9. a) Explain with the help of neat sketch the structure of dynamic RAM cell. Also discuss its advantages over static RAM cell. **7**

b) Explain virtual memory. Also explain how virtual address is translated into physical address. **7**

OR

10. a) Explain the various mapping techniques used in cache memory **8**

b) Differentiate between **6**
i) RAM and ROM. ii) RISC and CISC architecture.

11. a) Define interrupts. Explain in detail different types of interrupts. **4**

b) Explain the block diagram of two channel DMA controller. **5**

c) Explain the difference between memory mapped I/O and I/O mapped I/O. **4**

OR

12. a) What are tightly and loosely coupled systems? Explain. **5**

b) Explain the following. **8**
i) Array processors. ii) Online storage.
iii) Pipelining. iv) Memory Interleaving.

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