4287

MSc. 1st Semester, 2018

Paper: IT-12 Computer Architecture

Time : 3 Hrs. **Max. Marks: 75**

Attempt **five** *questions in all, Question No. 1 is compulsory. All questions carry equal marks.*

Q 1(a): What are the addressing modes in computer architecture? Explain their importance with suitable example. 5

(b): Explain asynchronous data transfer in detail. $2\frac{1}{2}$

(c): What is Flynn's classification of computers? $2\frac{1}{2}$

(d): What is virtual memory? Differentiate between multicomputer and multiprocessor system. 5

Q 2(a): Simplify the Boolean expression using K- map :

$$f(A, B, C, D, E) = \sum m(0, 2, 4, 7, 9, 12, 14, 15, 19, 20, 22, 24, 25, 28).$$

Calculate minimum number of logic gates required for its implementation. 8

(b): Calculate $1's$, $2'$s and $9's$ complement of 57_{10}. 3

(c): Solve using Boolean algebra: $(A + B)(A + C)$ and $\overline{A + \overline{B\,C}}$. 4

Q 3(a): Differentiate between a hard-wired controlled and a microprogrammed controlled unit. 5

(b): What are different types of expansion buses in computer architecture? Differentiate on the basis of their functionalities. 5

(c): Consider the following page reference stream: 5

1 2 1 3 2 5 2 3 6 2 4 6 3 1 3 6 1 2 4 3

Compare the number of page faults for LRU and FIFO page replacement schemes.

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Q 4(a): What are encoders? Explain the use of encoders in real life with examples. Design an 8 bit encoder using J-K flip flop. $2+3+5$.

(b): What are parallel and serial ports in a computer? Write the transmission sequence of a parallel port. $2+3$

Q 5(a): Explain the concept of shift registers. Differentiate between various types of shift registers available in a computer. $2+5$.

(b): What is an Instruction set? Differentiate between CISC and RISC architectures. 5.

(c): Discuss various types of memories used in a computers. 3

Q 6 Write short notes on each of the following:- 15

(a) Universal shift register
(b) Cache coherency
(c) Power PC architecture
(d) Kernel and device drivers
(e) ALU design

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