

6-12-2019

Roll No.

Total Pages : 3

MCA/D-19

10011

COMPUTER ORGANIZATION

Paper-MCA-14-12

Time Allowed : 3 Hours]

[Maximum Marks : 80

Note : Attempt five questions in all, selecting at least one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

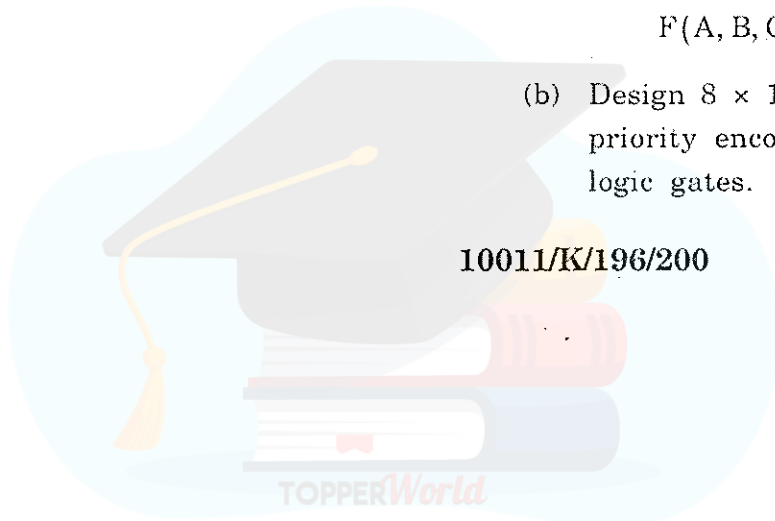
1. Answer the following questions in brief : $4 \times 4 = 16$
 - (a) What is K-Map ? Explain rules to use it.
 - (b) What is System Bus ? Explain its different parts.
 - (c) Distinguish between Horizontal Microcode and Vertical Microcode.
 - (d) Explain about memory protection mechanisms.

UNIT-I

2. (a) Simplify the following Boolean function using Quine McCluskey procedure :
$$F(A, B, C, D) = \sum(0, 1, 2, 8, 10, 11, 14, 15). \quad 8$$
 - (b) Design 8×1 priority encoder using two 4×1 priority encoder and any necessary additional logic gates. 8

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3. (a) What is Synchronous Binary counter ? Design 4-bit synchronous binary counter and explain its working with the help of timing diagram. 8
- (b) What is Flip-flop ? Draw the diagram and characteristics table for JK flip-flop. Also, construct D type flip flop using it. 8

UNIT-II

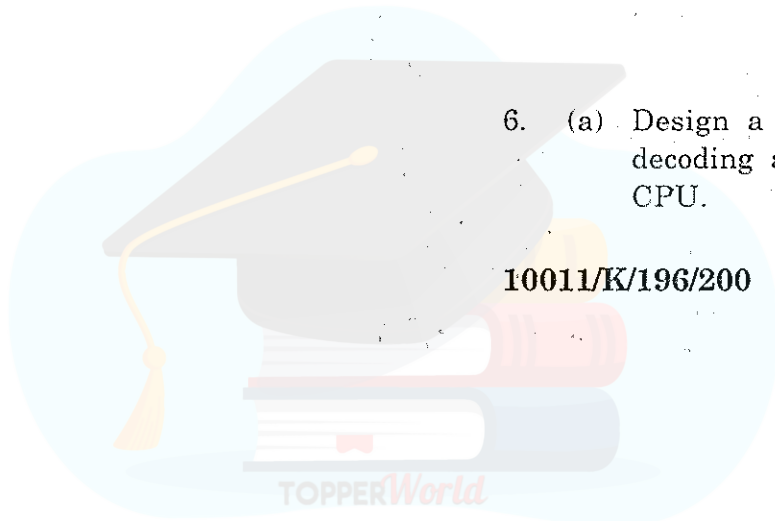
4. (a) How can you organize 16×2 memory subsystem by using two 8×2 ROM chips with high order interleaving ? 8
- (b) What is the need of I/O interface ? Draw the block diagram for generic I/O interface for an input device along with its circuitry of enable logic. 8
5. (a) Design a simple computer system with 16 bit address bus and 8 bit data bus which uses isolated I/O. Further suppose it has $8K \times 8$ RAM, $8K \times 8$ ROM and bidirectional I/O device. Show the design with all required signals and logic. 9
- (b) What is RTL ? How can you use RTL to specify a digital system ? Explain with an example. 7

UNIT-III

6. (a) Design a very simple CPU. Explain fetching, decoding and execution of instructions on this CPU. 8

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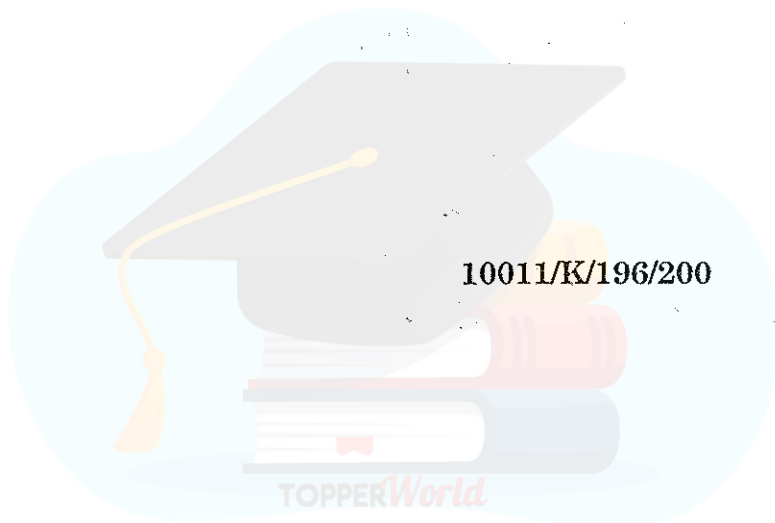
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- (b) What is Microsequencer ? Design a simple microsequencer and explain its working. 8
7. Write a shift-subtract division algorithm. Convert the algorithm into RTL code. Give the hardware implementation of this algorithm. 16

UNIT-IV

8. (a) What is Cache memory ? Explain direct mapping scheme used in Cache memory. What are limitations of this mapping scheme. 8
- (b) What is Virtual Memory (VM) ? Explain segmentation scheme of implementation of VM. 8
9. Write short notes on the following :
- (a) IOP. 8
- (b) RS232C standard. 8



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