QP Code: 3786

(3 Hours) Total Marks: 100 N. B.: (1) Question 1 is compulsory. Attempt any four from remaining. (3) Figures to the right indicate full marks. 20 Design 8086 based microprocessor system with following specifications. 8086 microprocessor working at 10 MHz. (ii) 32 KB of EPROM using 16 KB devices. (ii) 64 KB of SRAM using 16 KB devices. Draw the design and give the memory map. 10 (a) Describe different addressing modes of 8085 microprocessor with an example of each. 10 (b) With neat diagram describe programmer's model of 8085 microporcessor. 10 (a) Describe with neat diagram architecture of 8086 microprocessor. 10 (b) What is Bus arbitration? Describe the different Bus arbitration techniques with diagram. 10 (a) Describe with neat diagram 8255 PPI, also give the CWR. 10 (b) Describe with neat diagram IVT of 8086 microprocessor. 10 (a) Write an 8086 assembly language program to transfer a block of 5-16 bit numbers from memory location 10000H to 10002H (source and destination blocks are overlapped) 10 (b) Describe with neat diagram 8259 PIC. 10 (a) Differentiate between:— (i) I/O mapped I/O and memory mapped I/O (ii) SRAM and DRAM 10 Describe with neat diagram memory segmentation in 8086, also give merits and demerits of segmentation. 20 7. Write short notes on (any four): (a) Features of 8086 (b) RESET circuit of 8086 (c) RS-232C interface (d) Concept of DMA (e) 8288 bus controller

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QP Code: 3792

(OLD COURSE)

Duration: 3 hours

Total marks: 100

Note.(1) Question No. 1 is compulsory

- (2) Attempt any four questions from remaining six questions
- (3) Draw suitable diagrams wherever necessary
- (4) Assume suitable data, if necessary.
- Q1. (a) Explain Chomsky Hierarchy

(10)

- (b) Let G be the grammar . Find the leftmost derivation, rightmost derivation and passe (10) tree for the string 00110101
 - G: $S \rightarrow OB \mid 1A$

 $A \rightarrow 0 \mid 0S \mid 1AA$

 $B \rightarrow 1 | 1S | OBB$

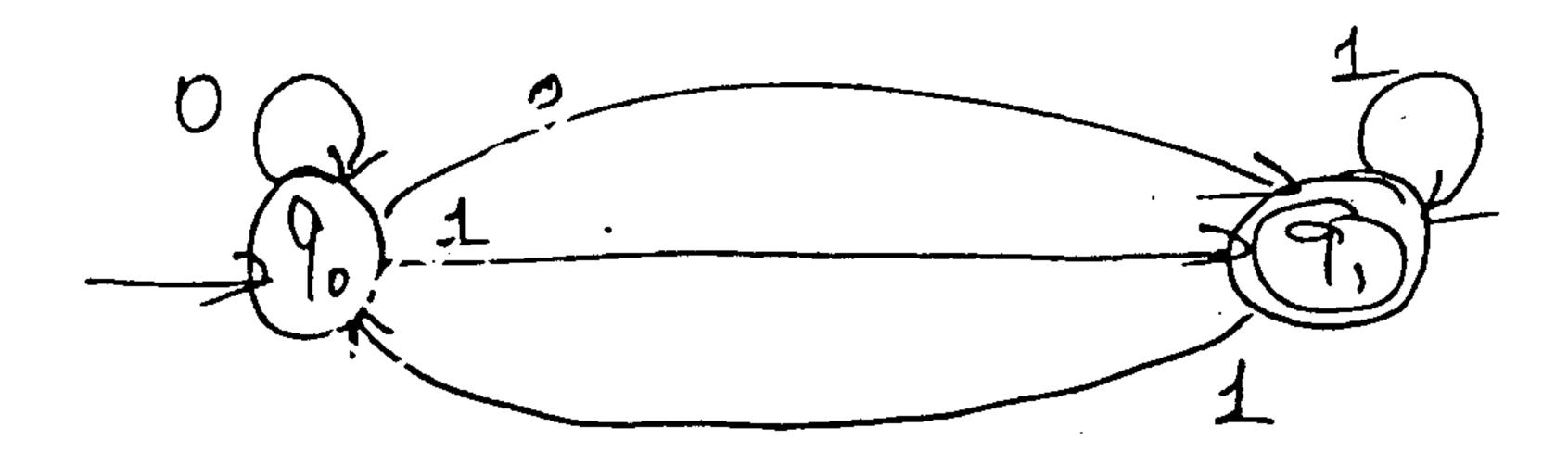
Q2. (a) For the aiphabet $\Sigma = \{0,1\}$, design a DFA to accept

(10)

- (i) a set of all strings ending with 100 or 101.
- (ii) a set of all strings that contain at least three 1's.
- (b) What is a regular expression? Give formal definition of a regular expression. Design a (10)

 DFA corresponding to the regular expression (a+b) * aba(a+b)*
- Q3. (a) Design a Moore and Mealy machine to convert each occurrence of a substring 100 by 101. (10)
 - (b) Convert the following NFA to a DFA

(10)



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Q4. (a) Using pumping lemma prove that the following language is not regular (10)

$$L = \{a^nb^n \mid n >= 0\}$$

(b) List and explain closure properties of regular languages .

(10)

Q5. (a) Design a Turing machine to accept the language $L = \{a^nb^n \mid n > = 1\}$

(b) Explain the rules for simplification of a context free grammar.

(15)

(10)

Q6 (a) Explain Chomsky Normal Form and convert the following CFG to CNF

(10)

 $S \rightarrow bA \mid aB$

 $A \rightarrow bAA \mid aS \mid a$

 $B \rightarrow aBB | bS | b$

(b) Define a PDA and construct a PDA for checking well formedness of parenthesis.

(10)

Q7. Write short notes on (any two)

(20)

- (a) Turing Machine
- (b) Halting Problem
- (c) Intractable Problems
- (d) Recursive and recursively enumerable languages

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