Seat No.

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S.E. (Computer Science & Engineering) (Semester - IV) Examination, May - 2019

COMPUTER ORGANIZATION

Sub. Code : 63533

Day and Date : Monday, 20 - 05 - 2019 **Total Marks : 50**

Time : 02.30 p.m. to 04.30 p.m.

Instructions :
1) **Figures to the right indicate full marks.**
2) **Question Q.1 & Question Q.4 are compulsory.**
3) **Attempt any one Question from Q.2, Q.3 and one from Question Q.5, Q.6**

Q1) a) Explain the Mechanical era computers. **[4]**
b) Give the comparison between RISC and CISC. **[4]**
c) With a block diagram explain accumulator based CPU. **[5]**

Q2) a) Explain the architecture of Pentium 4 Processor. **[6]**
b) Explain the IEEE 754 standard 32 bit floating point format with a one example. **[6]**

Q3) a) With the HDL description explain the Booths algorithm. **[6]**
b) Explain non-restoring division algorithm for unsigned integers with one example. **[6]**

Q4) a) Explain One-hot method of designing control unit for GCD processor. **[7]**
b) With a neat diagram explain the basic structure of micro programmed control unit. **[6]**

Q5) a) Explain the micro programmed control unit for 2's-compliment multiplier. **[6]**
b) Draw and explain the structure of an associative memory. **[6]**

Q6) a) Write a short note on TLB. **[6]**
b) Write a short note on memory allocation. **[6]**

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S.E. (Computer Science and Engg.) (Semester - III) (New Course)

Examination, May - 2019

DISCRETE MATHEMATICAL STRUCTURES

Sub. Code : 63525

Day and Date : Tuesday, 14 - 05 - 2019 **Total Marks : 50**

Time : 09.30 a.m. to 11.30 a.m.

Instructions : 1) Q.3 and Q.6 are Compulsory from Section - I and Section - II.

2) Attempt any one from Q.1 and Q.2 also any one from Q.4 and. Q.5.

SECTION - I

Q1) a) Obtain PDNF of the following without constructing Truth Table **[4]**

$$P \wedge (P \rightarrow Q)$$

b) Convert following prefix & suffix formulas into completely parenthesized form. **[4]**

i) $\rightarrow \neg PVQ \leftarrow\rightarrow R \neg S$

ii) $\rightarrow\rightarrow PQ\rightarrow\rightarrow QR\rightarrow PR$

c) Write a note on Cartesian Products and Ordered Pairs. **[5]**

Q2) a) Define with example **[4]**

i) Proper inclusion

ii) Symmetric difference

b) Let N be the set of natural numbers show that <N,+> and <N,x> are monoids. **[4]**

c) Given $S=\{a_1, a_2, a_3, \ldots\ldots a_8\}$ what subsets are represented by B_{17} and B_{31}? Also how will you designate the subsets $\{ a_2, a_6, a_7 \}$ and $\{ a_1, a_8 \}$? **[5]**

Q3) Write a short note on (Attempt any 3) : **[12]**

a) Properties of Binary Relation

b) Semigroup Homomorphism

c) Well formed Formula

d) Partial ordering

P.T.O.

SECTION - II

Q4) a) Define following with respect to Graph. **[6]**

i) Path

ii) Length of path

iii) Elementary Path

b) Explain PERT with example. **[6]**

Q5) a) Explain different properties of Lattice. **[6]**

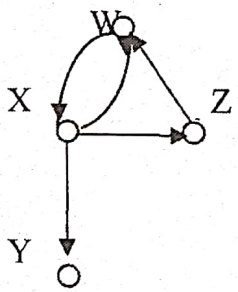
b) How many number of ways to choose three out of seven days (with repetitions allowed)? How many number of ways to choose seven out of three days (with repetitions necessarily allowed)? **[6]**

Q6) a) A box contains 6 white balls and 5 black balls find the number of ways 4 balls can be drawn from the box if **[6]**

i) Two must be white

ii) All of them must have the same color

b) Explain Storage representation of following diagraph **[7]**



OR

Write a note on Bays Theorem. **[7]**

Seat No.

S.E. (Computer Science and Engineering) (Semester - IV) (Revised) Examination, May - 2019

COMPUTER NETWORKS

Sub. Code : 63532

Day and Date : Thursday, 16 - 05 - 2019 **Total Marks : 50**

Time : 02.30 p.m. to 04.30 p.m.

Instructions :
1) **Solve any two questions from each section.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data whenever necessary.**

SECTION - I

Q1) a) Write a short note comparison of virtual-circuit and datagram networks. **[7]**

b) Explain count-to-infinity problem. **[5]**

Q2) a) Write a short note on classful addressing. **[6]**

b) Explain following with reference to classful addressing. **[6]**

i) Subnetting
ii) Supernetting
iii) Address Depletion

Q3) a) In brief explain any two following regarding congestion control in datagram subnets. **[6]**

i) The Warning Bit
ii) Choke Packets
iii) Hop-by-Hop Choke Packets

b) With neat diagram explain leaky bucket algorithm. **[7]**

SECTION - II

Q4) a) Explain the Berkeley socket primitives for TCP. **[7]**

b) Discuss the connection establishment procedure in transport protocol. **[6]**

P.T.O.

Q5) a) Draw and explain architecture of WWW. **[6]**

b) Describe DNS message in detail. **[6]**

Q6) a) Explain the symmetric key encryption algorithm. **[6]**

b) Explain rotation cipher. In asymmetric-key cryptography, how do you think two persons can establish two pairs of keys between themselves? **[6]**

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S.E. (Computer Science and Engineering) (Semester - IV)

Examination, May - 2019

AUTOMATA THEORY

Sub. Code : 63531

Day and Date : Tuesday, 14 - 05 - 2019 **Total Marks : 50**

Time : 02.30 p.m. to 04.30 p.m.

Instructions :
1) **Question No. 1 and Question No. 4 are Compulsory.**
2) **Solve any one question from questions No.2 & question No. 3.**
3) **Solve any one question from questions No.5 & question No. 6.**
4) **Assume suitable data wherever necessary.**
5) **Figures to the right indicate full marks.**

Q1) Solve any three questions: **[15]**

a) Remove A productions from the grammar

$S \rightarrow ABCBCDA$

$A \rightarrow CD$

$B \rightarrow Cb$

$C \rightarrow a \mid \Lambda$

$D \rightarrow Bd \mid \Lambda$

b) Write a regular expression for

i) The Language containing strings starting with 01?

ii) The Language containing strings not containing 00?

c) State & prove Kleen's theorem Part I.

d) Design a DFA For the regular expression (11+110)*.

Q2) a) Find the context free grammar for the following languages. **[6]**

i) $L=\{a^i b^j c^k \mid i = j + k\}$

ii) $L=\{ a^n b^m a^n \mid n \geq 0, m \geq 1\}$

b) Compare DFA with NFA. **[4]**

Q3) a) Explain recursive descent parsing. **[4]**

b) What is ambiguous CFG? Explain an example of ambiguous CFG. **[6]**

P.T.O.

Q4) Solve any three questions : **[15]**

a) Define Following Terms:

i) Pushdown Automata.

ii) Acceptance of a string by PDA.

b) Write Short note on "Universal Turing Machine".

c) Explain with suitable example intersection of two Context Free Languages.

d) Construct a Turing Machine for accepting even length string.

Q5) a) Construct PDA for following CFG. **[6]**

$S \rightarrow [S] \mid \{S\} \mid \Lambda$

b) Write short note on "Configuration of a PDA". **[4]**

Q6) a) Construct a Turing Machine to accept regular language represented by following regular expression **[6]**

$r = (a + b)^*abb$

b) Define Turing Machine and acceptance of a string by Turing Machine. **[4]**

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S.E. (Computer Science and Engineering) (Semester - III) (Revised) Examination, May - 2019

DATA STRUCTURES

Sub. Code : 63526

Day and Date : Thursday, 16 - 05 - 2019 **Total Marks : 50**

Time : 09.30 a.m. to 11.30 a.m.

Instructions :
1) **All Questions are Compulsory.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data whenever necessary.**

Q1) a) With help of suitable example, explain working of PUSH and POP operations of Stack. **[7]**

OR

Explain applications of stack. Write an algorithm for converting infix to prefix notation using stack.

b) Explain following terms with help of suitable example. **[6]**
   a) Function.
   b) Time and Space Complexity.
   c) Data Types.

Q2) a) With help of suitable example, explain working of Bubble Sort. **[4]**

b) Choose appropriate search technique and solve search of given key elements **[4]**
   12, 24, 26, 28, 35, 42, 44, 60, 70
   Key : 24 Key : 42 Key : 100 Key : 35

c) What is Queue? Explain drawback of simple Queue. **[4]**

Q3) a) Construct algorithm for following operations on a Circular Linked List. **[7]**
   i) Create at Start
   ii) Delete at End
   iii) Traverse

OR

What is Doubly Linked List? List various operations of Doubly Linked List and explain any one operation.

b) Explain basic graph terminologies with help of suitable examples. **[6]**

P.T.O.

Q4) a) Write algorithm for counting the number of elements in a given singly linked list. **[4]**

b) What is B-Tree? Explain with help of suitable example, creation of B-Tree? **[4]**

c) Define Tree. Explain basic tree terminologies. **[4]**

Seat No.

S.E. (Computer Science & Engineering) (Part - II) (Semester - III) (Revised) Examination, May - 2019

Data Communications

Sub. Code : 63527

Day and Date : Monday, 20 - 05 - 2019 **Total Marks : 50**

Time : 09.30 a.m. to 11.30 a.m.

Instructions :
1) **Solve any TWO questions from each Section**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data whenever necessary.**

SECTION - I

Q1) a) Define data communications & explain the effectiveness of a data communications system depends on which four fundamental characteristics. **[6]**

b) With neat diagram for data link layer discuss about any four responsibilities of data link layer in OSI model. **[7]**

Q2) a) Explain the Composite Signals with proper diagram. **[5]**

b) Explain about Self-synchronization. Draw a neat diagram for Effect of lack of synchronization. In a digital transmission, the receiver clock is 0.1 percent faster than the sender clock. How many extra bits per second does the receiver receive if the data rate is 1 kbps? **[7]**

Q3) a) Explain Coaxial cable with neat diagram. Mention the applications of Coaxial cable. **[6]**

b) Explain in brief about any TWO from following : **[6]**

i) NIC Cards

ii) Bridges

iii) Routers

P.T.O.