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S.E. (CSE) (Semester - III) (New Course)

Examination, November - 2017

DISCRETE MATHEMATICAL AND STRUCTURES

Sub. Code : 63525

Day and Date : Monday, 13-11-2017

Total Marks : 50

Time : 9.30 a.m. to 11.30 a.m.

- Instructions :
- 1) Q.3 and Q. 6 are Compulsory from Section I and Section II.
 - 2) Attempt anyone questions from Q.1 and Q. 2.
 - 3) Attempt anyone questions from Q.4 and. Q.5.

SECTION - I

Q1) a) Define well formed formula State whether the following are wffs. [4]

i) $(A \rightarrow B) \vee (B \rightarrow C)$

ii) $((\neg B) D) \rightarrow (P \rightarrow Q)$

b) Obtain PDNF of, $\neg P \vee Q$. [4]

c) Give the Power set of following [5]

$A = \{a, b, c\}, B = \{1, \Phi\}$

Q2) a) Let $X = \{1, 2, 3\}$ and f, g, h and s be functions from X to X given by [4]

$f = \{ \langle 1, 2 \rangle, \langle 2, 3 \rangle, \langle 3, 1 \rangle \}$ $g = \{ \langle 1, 2 \rangle, \langle 2, 1 \rangle, \langle 3, 3 \rangle \}$

$h = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 1 \rangle \}$ $s = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 3 \rangle \}$

Find i) $g \circ f$ ii) $f \circ g$ iii) $s \circ g$ iv) $f \circ s$

b) What is a monoid homomorphism and Explain with example? [4]

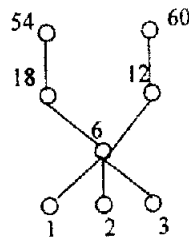
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c) Find lower bounds and upper bounds and GLB and LUB (if any) for the set [5]

i) {6, 12, 60}

ii) {12, 18, 54, 60}



Q3) Write a short note on (any 3)

[12]

- Partitioning and covering of set.
- Functionally complete set of connectives.
- Properties of equivalence relations.
- Clock algebra.

SECTION - II

Q4) a) Define following w.r.t graph

[6]

- Path
- Node base
- Connected graph

b) Explain different methods of storage representation of graph.

[6]

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- Q5) a)** Explain rule of product and rule of sum with example? [6]
- b) Define following [6]
- i) Lattice.
 - ii) Direct product.
 - iii) Distributive lattice.

- Q6) a)** When a certain defective die is tossed, the numbers from 1 to 6 will appear with following probabilities [6]

$$p(1) = 2/18$$

$$p(2) = 3/18$$

$$p(3) = 4/18$$

$$p(4) = 3/18$$

$$p(5) = 4/18$$

$$p(6) = 2/18$$

Find the probability that

- i) An odd number is on top
 - ii) a prime number is on top
 - iii) A number less than 5 is on top
- b) Write a short note on PERT. [7]

OR

Let $G = \{1, 2, 3, 4, 5\}$ and the operation addition module 6 is denoted by $+_6$ prepare composition table and show that set G is not a group. [7]



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**S.E. (Computer Science & Engg.) (Part-II) (Semester-III)
(Revised) Examination, November - 2017**

DATA STRUCTURES

Sub. Code : 63526

Day and Date : Wednesday, 15-11-2017
Time : 9.30 a.m. to 11.30 a.m.

Total Marks : 50

- Instructions :**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data wherever necessary.

- Q1) a)** With help of suitable algorithm, explain working of Enqueue and Dequeue operation of Simple Queue. [7]

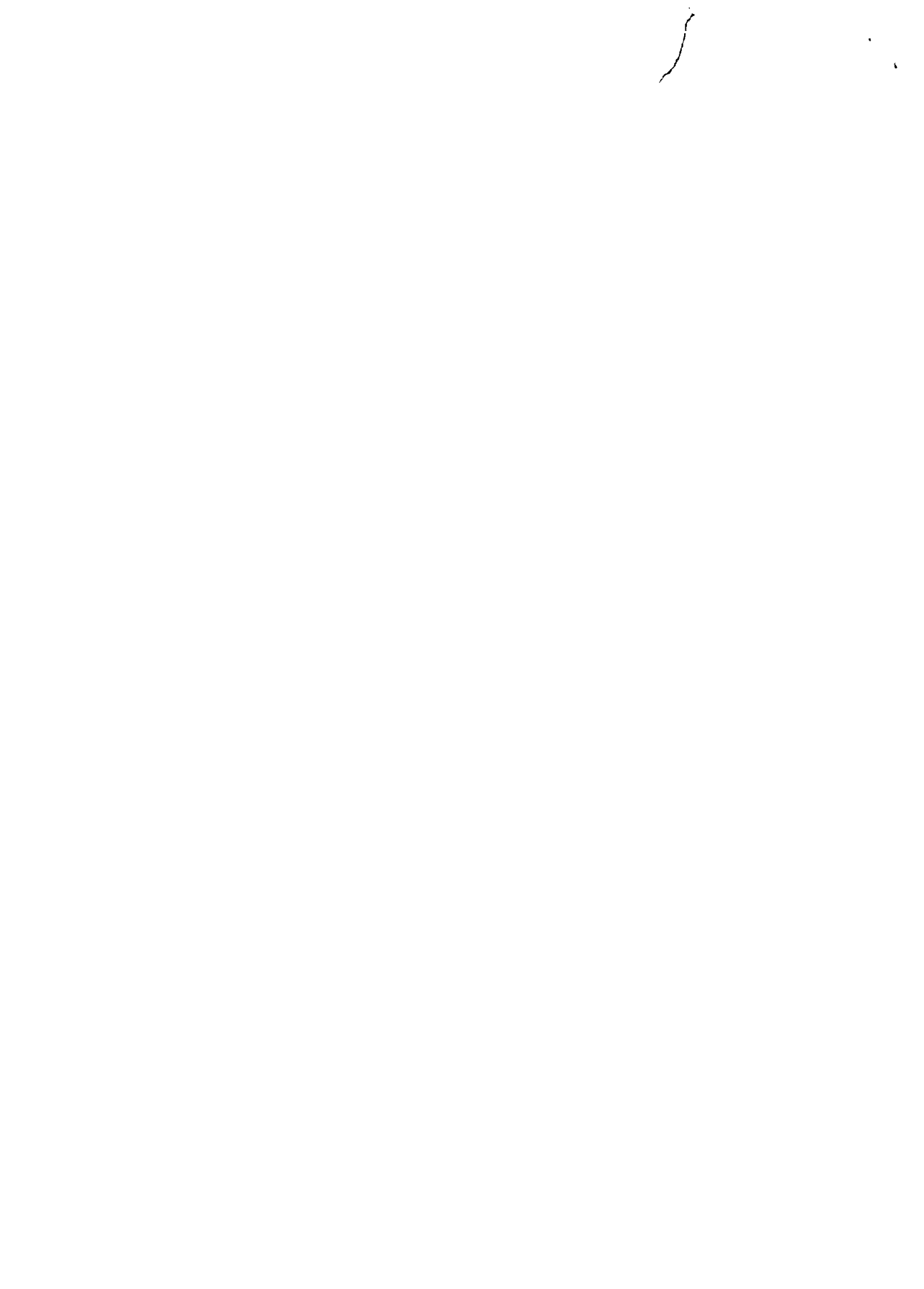
OR

With the help of suitable example, explain following operations of Circular Queue.

- i) Enqueue
 - ii) Dequeue
 - iii) Traverse
- b)** Explain following terms with help of suitable example [6]
- i) Array
 - ii) Function
 - iii) Structure

- Q2) a)** Write a C program to implement Insertion Sort. [4]
- b)** What is Hashing? Explain Open and Closed hashing. [4]
- c)** Compare Linear Search and Binary Search. [4]

P.T.O.



- Q3) a)** Construct algorithm for following operations on a Doubly Linked List [7]
- i) Create at End
 - ii) Delete at Start
 - iii) Traverse
- b) Define Graph? Explain BFT and DFT Traversal Techniques. [6]

OR

Explain basic graph terminologies with help of suitable examples.

- Q4) a)** Write algorithm to delete a node at given location in a Singly Linked List. [4]
- b) What is AVL Tree? Explain with help of suitable example, construction of AVL Tree. [4]
- c) With help of suitable example, explain inorder, preorder and postorder traversal techniques. [4]



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S.E. (CSE) (Part - II) (Semester - III) (Revised)
Examination, November - 2017
DATA COMMUNICATIONS
Sub. Code: 63527

Day and Date : Tuesday, 21 - 11 - 2017
Time : 9.30 a.m. to 11.30 a.m.

Total Marks : 50

- Instructions :**
- 1) Solve any TWO questions from each Section.
 - 2) Figures to the right indicate full marks.

SECTION - I

- Q1) a)** Write a short note on four fundamental characteristics on which the effectiveness of a data communications system is depend. [6]
- b) With neat diagram for physical layer discuss about the any five responsibilities of physical layer in OSI model. [7]
- Q2) a)** Explain Nyquist Bit Rate for noiseless channel.
 Consider the noiseless channel with bandwidth of 3000 Hz transmitting a signal with two signal levels. What is the maximum bit rate? [6]
- b) Explain about Manchester line coding scheme.
 Draw diagram for 1010111110 using Manchester scheme. [6]
- Q3) a)** Write about any five advantages and any two disadvantages of optical fiber. [7]
- b) Explain in brief about any TWO about following : [6]
- i) Repeaters.
 - ii) Bridges.
 - iii) Switches.

P.T.O.

SECTION - II

- Q4)** a) Define Hamming distance and Explain Hamming code for C(7,4) in detail. [7]
b) Explain piggy backing concept in detail. [6]
- Q5)** a) Design the Selective Repeat Protocol for Noisy channels in detail. [7]
b) Explain IEEE standard in detail. [6]
- Q6)** a) Explain Slotted ALOHA Protocol in detail. [6]
b) Explain 802.6 standard (DQDB) and 802.2 logical link. [6]



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S.E. (CSE) (Part - II) (Semester - III) Examination, November - 2017

MICROPROCESSORS

Sub. Code : 63528

Day and Date : Thursday, 23 - 11 - 2017

Total Marks : 50

Time : 9.30 a.m. to 11.30 a.m.

- Instructions :**
- 1) Attempt any two Questions from Q.No. 1, 2, 3 and 5, 6, 7.
 - 2) Question No. 4 and 8 are compulsory.

SECTION - I

- Q1) a)** Draw and explain architecture of 8085 Microprocessors. [5]
b) Write Concept of Real Mode memory addressing of microprocessors. [5]
- Q2) a)** Explain all Data addressing Mode of advanced microprocessors. [5]
b) Write and explain program of subtraction between two 8-bit no. [5]
- Q3) a)** Explain MOV Revisited concept of 16 bit instruction mode with example. [5]
b) Explain PUSH/POP instructions of advanced microprocessors. [5]
- Q4) Write short note on (any one) :** [5]
a) Access Right Byte.
b) Flag register for entire 80 × 86 and Pentium microprocessor family.
c) 80386-P4 descriptor.

SECTION - II

- Q5) a)** Explain all Addition and Subtraction instruction of advanced Microprocessors. [5]
b) Explain the 80386 Microprocessor. The memory system. [5]
- Q6) a)** Draw and explain the internal structure of the Pentium-Pro microprocessor. [5]
b) Explain Basic Interrupt Processing. [5]

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- Q7)** a) Explain all BCD and ASCII instructions in details.
b) Explain Memory Paging Mechanism.

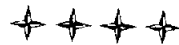
[5]

[5]

Q8) Write short note on (any one) :

[5]

- a) Hyper Threading Technology.
b) Special Pentium Register.
c) The Jump Group.



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S.E. (Computer Science and Engineering) (Semester - IV)
Examination, November - 2017
AUTOMATA THEORY
Sub. Code : 63531

Day and Date : Wednesday, 01 - 11 - 2017
Time : 9.30 a.m. to 11.30 a.m.

Total Marks : 50

- Instructions :**
- 1) Question no. 1 and 4 are compulsory.
 - 2) Solve any one question out of question no. 2 and 3.
 - 3) Solve any one question out of question no. 5 and 6.
 - 4) Assume suitable data wherever necessary.
 - 5) Figures to the right indicate full marks.

Q1) Solve any three questions : [15]

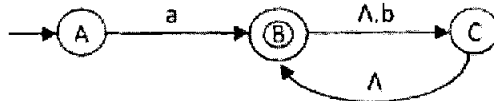
- a) Design a DFA for language over $\Sigma = \{0,1\}$ and string containing substring "0110".
- b) What is context free Languages (CFL)?
- c) Describe nondeterministic finite automata with Λ transition & recursive definition for extended transition function for NFA - Λ .
- d) Convert the following grammar to its Chomsky Normal form.

$$S \rightarrow bA \mid aB$$

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

$$B \rightarrow aBB \mid b$$

Q2) a) Obtain NFA from following NFA - Λ . [4]



P.T.O.

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- b) If $L1 = \{x | 00 \text{ is not a substring of } x\}$ and $L2 = \{x | x \text{ ends with } 01\}$, Design a DFA for $L1 - L2$. [6]

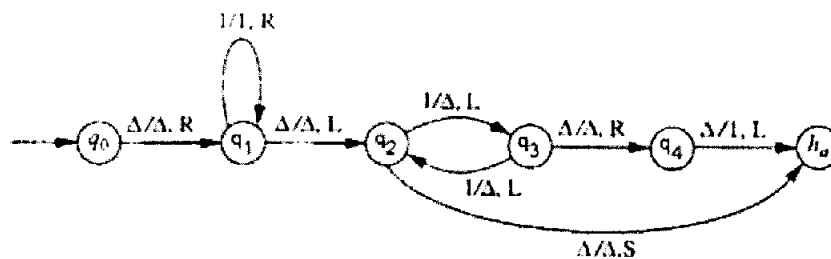
- Q3) a)** Describe Top-down parsing. [4]
b) NFA with states 1-5 & input alphabet $\{a, b\}$ has the following transition table. [6]

State (q)	$\delta(q, a)$	$\delta(q, b)$
1	{1, 2}	{1}
2	{3}	{3}
3	{4}	{4}
4	{5}	-
5	-	{5}

- i) Draw a DFA.
 ii) Calculate $\delta^*(1, ab)$.
 iii) Calculate $\delta^*(1, abaab)$.

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

- a) Define following terms :
 i) Computation of partial function using Turing Machine.
 ii) Acceptance of a string by PDA.
 b) Prove Pumping Lemma for Context Free Language.
 c) For following Turing machine :



Trace moves from q_0 state for string "11111" on tape and comment on the result on the tape when the machine enters in the h_0 state.

- d) Design PDA for $L = \{a^m b^n | m > n \text{ and } n > 0\}$.

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Q5) a) Design PDA for $L = \{a^i b^j c^k \mid k = i + j \text{ and } i, j > 0\}$. [6]

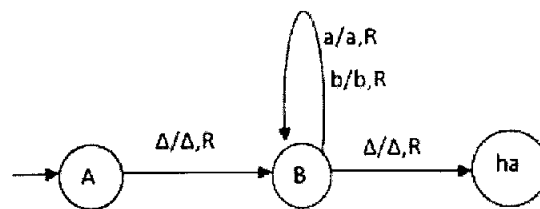
b) Design Top-down PDA for following Grammar : [4]

$S \rightarrow AB$

$A \rightarrow aA \mid a$

$B \rightarrow bB \mid b$

Q6) a) Give Encoding of following Turing Machine : [7]



b) Define Turing Machine. [3]



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S.E. (CSE) (Part - II) (Semester - IV) (Revised) (Theory)
Examination, November - 2017
COMPUTER NETWORKS
Sub. Code: 63532

Day and Date :Thursday, 02 - 11 - 2017
Time :9.30 a.m. to 11.30 a.m.

Total Marks : 50

- Instructions :**
- 1) **Solve any TWO questions from each section.**
 - 2) **Figures to the right indicate full marks.**
 - 3) **Attempt any one Question from Q.4 to Q.5.**
 - 4) **Q.6 is compulsory.**
 - 5) **Assume suitable data if necessary.**

SECTION-I

- Q1) a) With neat diagram explain Store-and-Forward Packet Switching. [6]**
- b) With context to routing within a datagram network discuss about Implementation of connectionless Service. [6]**
- Q2) a) Change the following IPv4 addresses from dotted-decimal notation to binary notation. [6]**
- i) 111.56.45.78
 - ii) 221.34.7.82
- b) In context to IPv6 write about [6]**
- i) Unicast Addresses
 - ii) Multicast Addresses
 - iii) Anycast Addresses

P.T.O.

- Q3) a)** With explanation Write about any TWO policies that cause congestion in network layer. [4]
- b) Explain how Hop-by-Hop Choke Packets technique is used for Congestion Control in Datagram Subnets. [3]
- c) With neat diagram write a short note on Token Bucket Algorithm. [6]

SECTION-II

- Q4) a)** Explain the working of RSA Algorithm with the help of example and mention the level of Security in RSA. [7]
- b) Explain the two army problem in connection release of transport layer.[6]

- Q5) a)** Define the terms [6]
- i) Transport Entity
 - ii) TPDU
 - iii) TSAP & NSAP
- b) List the states used in TCP connection management finite state machine.[3]
- c) Describe the architecture and services of Email. [4]

- Q6) Write a short note on (any three) [12]**
- a) Domain name space
 - b) World wide Web
 - c) FTP
 - d) Crash recovery



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S.E. (CSE) (Part-II) (Semester - IV)
Examination, November - 2017
COMPUTER ORGANIZATION (Theory)
Sub. Code : 63533

Day and Date : Friday, 03 - 11 - 2017
Time : 9.30 a.m. to 11.30 a.m.

Total Marks : 50

- Instructions :
- 1) Solve all Questions
 - 2) Q.No.1 and Q.No.4. is compulsory
 - 3) Solve any one from Q.No.2,Q.No. 3 and one from Q.no.5,Q.No.6
 - 4) Figures to right indicate full marks.

SECTION - I

- Q1) a)** Write the IEEE 754 64 bit floating point number format. [1]
b) Write Non-restoring division algorithm for unsigned integers. [6]
c) Illustrate Booth multiplication algorithm for [6]
X=10110011 Y=11010101
- Q2) a)** Write a short note on 1. Electronic Era 2. Mechanical Era. [6]
b) Write a short note on 1.RISC Computer 2.CISC Computer. [6]
- Q3) a)** Explain P-IV Processor. [6]
b) Explain overview of CPU Behavior. [6]
- Q4) a)** Explain Memory allocation. [7]
b) Explain Cache Organizations. [6]

P.T.O.

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- Q5)** a) Design GCD processor using classical method. [6]
b) Draw and explain flowchart of the accumulator based CPU [6]
- Q6)** a) Design two's complement multiplier control unit using micro programmed approach [6]
b) Write a short note on
i) Parallelisms in microinstructions.
ii) Microoperation timing. [6]

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S.E. (CSE) (Part - II) (Semester - IV) (Revised)
Examination, November - 2017
OPERATING SYSTEM - I (Theory)
Sub. Code : 63534

Day and Date : Monday, 6-11-2017

Total Marks : 50

Time : 9.30 a.m. to 11.30 a.m.

- Instructions :**
- 1) Q. No.1 from and Q. No.4 are compulsory.
 - 2) Solve anyone from Q. No.2 and 3 and anyone from Q. No.5 and 6.
 - 3) Assume suitable data wherever necessary.

SECTION - I

- Q1) a)** Discuss an abstract view of an Operating System. [7]
b) What are the functions of an Operating System? [6]
- Q2) a)** Discuss different synchronization and buffering techniques involved in IPC. [6]
b) Explain process creation in detail. [6]
- Q3) a)** Explain the use of hardware instructions to solve the critical section problem. [6]
b) Give the solution to the FIRST writers - readers problem. [6]

SECTION - II

- Q4) a)** Give an example where there is a cycle in the resource allocation graph but no deadlock. [6]
b) Why does deadlock recovery comes with a compromise / loss? [7]

P.T.O.

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Q5) a) Why is safety algorithm used? What is a safe sequence? Can we have multiple safe sequences? Justify your answer. [6]

b) With the help of a diagram explain demand loading of a page. [6]

Q6) Write Short Notes on - (Any three) [3 × 4]

a) Deadlock Avoidance.

b) LRU Page Replacement.

c) File Operations.

d) Characteristics of I/O devices (Application I/O interface).



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S.E. (CSE) (Semester - IV) (Revised) Examination, November - 2017
SOFTWARE ENGINEERING (Theory)
Sub. Code: 63535

Day and Date : Tuesday, 07 - 11 - 2017

Total Marks : 50

Time : 9.30 a.m. to 11.30 a.m.

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

Q1) a) Explain prototyping model in detail. [6]

b) What is SRS? State and briefly explain the desirable qualities of the SRS documents. [7]

Q2) a) What is a project management process? Briefly explain the three phases in it. [7]

b) What do you mean by the project planning process? State and briefly explain the activities in it. [6]

Q3) Write short note on (any 3) [4 + 4 + 4]

- a) Scale and change
- b) Team structure
- c) Risk Management
- d) SEI CMM.

P.T.O.

Q4) a) When do you say that a system is modular? Explain the concept of open-closed principle. [6]

b) Explain black box testing in detail. [7]

Q5) a) What is the objective of coding? Explain the concept of code walkthrough in code reviews. [6]

b) Explain the concept of software reliability? State the main reasons that make software reliability more difficult to measure than hardware reliability. [7]

Q6) Write short note on (any three) [4 + 4 + 4]

a) Verification.

b) Program Analysis Tools.

c) ISO 9000.

d) Agile software development.

