Seat
No.

S.E. (CSE) (Semester-III) Examination, November - 2018

APPLIED MATHEMATICS

Sub. Code : 63524

Day and Date : Tuesday, 20 - 11 - 2018

Total Marks : 50

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

Instructions: 1) Answer any two questions from each section.

2) Use of calculator is allowed.

SECTION - I

Q1) Attempt any two [12]

a) Using following data find equation of regression to estimate Y when X is known

Age of Husband (X)	45	66	75	98	83	84	50
Age of Wife (Y)	40	65	71	95	75	80	48

b) Find value of following integral using Simpson's 3/8th rule

$$\int_0^{1.2} e^x x^5 dx$$

c) Determine root of the equation correct up to four decimal places using Secant Method $\tan x - 2e^{-2x} = 0$

Q2) Attempt any two [12]

a) If an engineerscan resolve customer complains 80% of times. What is the probability that on a particular day out of 10 complains received

i) Engineer will resolve all complains.

ii) Engineer will be unable to resolve at least one complains.

b) Number of accidents in an industry in a day follows Poisson probability distribution. If variance of n~'er of accidents is one, find probability that on certain day there will at the most one accident or there will be two accidents.

c) If wage of workers is normally distributed with mean 5500 and variance 625 then what percent of workers will have wage

i) more than 5470?

ii) less than 5530?

Area under normal curve from 0 to 1.2 is 0.3849.

P.T.O.

Q3) a) Fit Binomial probability distribution to the following data of number of defective components in 200 samples each of size 6. Hence find theoretical frequencies. **[6]**

Number of defective components	0	1	2	3	4	5	6
Number of samples	35	52	48	35	15	9	6

b) Fit second degree parabola using method of least squares to the following data **[7]**

x	1	2	3	4	5		7	8	9
y	3	4	6	6	9	10	10	12	12

SECTION - II

Q4) Following table represent expected cost required (in min.) to five different groups for completing four different tasks. Determine assignment schedule in order to minimize the cost of completion of tasks. **[12]**

		Group			
		A	B	C	D
	I	350	280	260	310
	II	340	350	240	320
Task	III	290	380	350	330
	IV	270	270	330	320

Q5) a) Define scalar cardinality and fuzzy cardinality. **[3]**

b) Let $A(x) = \dfrac{0.3}{1} + \dfrac{0.9}{2} + \dfrac{0.7}{3}$ and $B(x) = \dfrac{0.4}{0} + \dfrac{0.5}{1}$. Also if $f : X \times X \to X$ is difined for all $x_1, x_2 \in X$ such that $f(x_1, x_2) = x_1 \times x_2$ then using extension principle find $f(A, B)$. **[5]**

c) Find $(\overline{A \cap B})$ using the fuzzy set defined by **[5]**

$A(x) = \dfrac{x}{x^2 + 1}$, $x \in \{0, 1, 2, 3, 4\}$ and $B(x) = \dfrac{1}{x+1}$, $x \in \{0, 1, 2, 3, 4\}$

-2-

Q6) Attempt any two [12]

a) Find α-cut and strong α-cut for $\alpha = 0.1, 0.3$. for the fuzzy set defined by

$$C(x) = \frac{1}{x^2 + 1}, \quad x \in \{1, 2, 3, 4\}$$

b) If $A(x) = \frac{0.2}{x_1} + \frac{0.5}{x_2} + \frac{0.7}{x_3} + \frac{0.3}{x_4}$ and $B(x) = \frac{0.3}{x_1} + \frac{0.4}{x_2} + \frac{0.6}{x_3} + \frac{0.3}{x_4}$

Find scalar cardinality of $A \cup B$ and $\overline{A \cup B}$

c) Find fuzzy number $A + B$ using following fuzzy numbers

$$A(x) = 0 \ x \leq -2, x > 4; \ A(x) = \frac{x+2}{3} \ -2 \leq x \leq 1; \ A(x) = \frac{4-x}{3} \ 1 < x \leq 4$$

and

$$B(x) = 0 \ x \leq 4, x > 10; \ B(x) = \frac{x-4}{3} \ 4 < x \leq 7; \ B(x) = \frac{10-x}{3} \ 7 < x \leq 10$$

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Seat
No.

S.E. (Computer Science and Engineering) (Semester - III)
(Revised) Examination, November - 2018
DATA STRUCTURES
Sub. Code : 63526

Day and Date : Tuesday, 27 - 11 - 2018

Time : 09.30 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 whenever necessary.

Q1) a) With help of suitable example, explain following conditions in Stack [7]

    i) Stack Overflow

    ii) Stack Underflow

    iii) Traverse in Stack

OR

Explain with help of suitable example working of Priority Queue.

b) Explain following terms with help of suitable example : [6]

    i) Pointer

    ii) Structure

    iii) Control Structure

Q2) a) Explain algorithm for Merge Sort. [4]

b) With help of suitable example, explain working of Linear Search. [4]

c) What is Hashing? Explain different types of Hash Functions. [4]

Q3) a) Construct algorithm for following operations on a Singly Linked List [7]

    i) Create at Start

    ii) Delete at End

    iii) Traverse

P.T.O

OR

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

b) Explain following graph storage mechanism. [6]

   i) Adjacency Matrix

   ii) Adjacency Lists

Q4) a) Write algorithm for creating a node at given location in a Doubly Linked List. [4]

b) What is Heap? Explain how heap can be used to sort the elements of array. [4]

c) Explain following types of Trees : [4]

   i) Binary Tree

   ii) Strictly Binary Tree

   iii) Complete Binary Tree

   iv) B- Tree

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No.

S.E. (Computer Science and Engineering) (Semester - III) (New) Examination, November - 2018
DISCRETE MATHEMATICAL AND STRUCTURES
Sub. Code : 63525

Day and Date : Saturday, 24 - 11 - 2018

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 Q1 and Q. 2 also any one from Q.4 and. Q.5

SECTION - I

Q1) a) Obtain PCNF and PDNF of the following without constructing Truth Table

$$\left(\neg P \to R\right) \wedge (Q \longleftrightarrow P)$$ [4]

b) Show that [4]

$$\left(\sim P \wedge (\sim Q \wedge R)\right) \vee (Q \wedge R) \vee (P \wedge R) \Leftrightarrow R$$

c) Draw Venn diagram [5]

  i) $A - (B - C) = (A - B) \vee (A \cap B \cap C)$

  ii) $(A - B) - C = A - (B \cup C)$

Q2) a) $A = \{\alpha, \beta\}$ $B = \{1, 2, 3\}$ what are $A \times B$, $B \times A$, $B \times B$, $(A \times B) \cap (B \times A)$ [4]

b) What is monoid Homomorphism? Explain with example [4]

c) Demonstrate that R is a valid inference from the premises $P \to Q$, $Q \to R$, and P [5]

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

  a) Properties of Binary Relation

  b) Clock Algebra

  c) Duality law and Duality theorem

  d) Partitioning and covering of set.

P.T.O.

SECTION - II

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

    i)   Mixed Graph

    ii)   Isomorphic graph

    iii) Multigraph

  b) Explain Matrix representation of graph with example **[6]**

Q5) a) Write a short note on Distributive Lattice **[6]**

  b) In how many ways three examination can be scheduled in five day period so that no two examinations are scheduled on the same day.? **[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]**
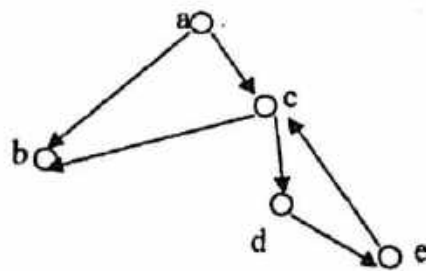
OR

  b) Explain rule of product & rule of sum. **[7]**

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Seat
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S.E. (Computer Science & Engineering) (Part - II)
(Semester - III) (Revised) Examination, November - 2018
DATA COMMUNICATIONS
Sub. Code : 63527

Day and Date : Thursday, 29 - 11 - 2018   Total Marks : 50

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

Instructions :   1)   Solve any two questions from each section.

              2)   Figures to the right indicate full marks.

SECTION - I

Q1) a)   Define topology & explain star topology with neat diagram.   **[6]**

     b)   With neat diagram for transport layer discuss about any four responsibilities of transport layer in OSI model.   **[6]**

Q2) a)   Define the terms Bandwidth, Throughput & Latency w.r.to measure network performance.

          What are the propagation time & transmission time for a 2.5-kbyte message (an e-mail) if the bandwidth of the network is 1 Gbps? Assume that the distance between the sender & the receiver is 12,000km & that light travels at 2.4×10^8 m/s.   **[6]**

     b)   Explain about NRZ (Non-Return-to-Zero) & Polar RZ line coding scheme. Draw diagram for 010011 using NRZ & Polar RZ.   **[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)   Bridges

         ii)   Switches

         iii)   Routers

P.T.O.

SECTION - II

Q4) a) With the help of proper example explain the encoder and decoder in Cyclic Redundancy Check (CRC). **[5]**

b) With neat diagram and algorithm explain Stop-and-Wait Protocol. **[7]**

Q5) a) Explain any TWO of the following with neat diagram. **[8]**

   i) 1-persistent CSMA

   ii) Nonpersistent CSMA

   iii) p-persistent CSMA

b) With diagram explain about Token Passing related to Collision-Free Protocols. **[5]**

Q6) a) With neat structure of 802.3 MAC frame format write about each field in the frame. **[9]**

b) In short explain 10Base2: Thin Ethernet. **[3]**

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Seat
No.

S.E. (CSE) (Semester - III) Examination, December - 2018
MICROPROCESSORS
Sub. Code : 63528

Day and Date : Saturday, 01 - 12 - 2018

Total Marks : 50

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

Instructions :   1)   Attempt any one question from Q.No. 1, 2 and 5, 6.

2)   Question No. 3, 4 and 7, 8 are compulsory.

SECTION - I

Q1) a)   Write and explain program of subtraction between two 16-bit no.   **[5]**

b)   Explain Stack Memory addressing Mode of advanced microprocessors.

[5]

Q2) a)   Draw and explain Flag register for entire 80×86 and Pentium microprocessor.   **[5]**

b)   Explain descriptor of 80286 microprocessor with proper diagram.   **[5]**

Q3) a)   Explain MOV Revisited concept of 16 bit instruction mode with example.

[5]

b)   Draw and Explain architecture of 8085 Microprocessors.   **[5]**

Q4) Write Short Note on (any one) :   **[5]**

a)   Branching Instructions of 8085.

b)   Access Right Byte.

c)   Memory Paging.

SECTION - II

Q5) a)   Explain the structure of 80386 Microprocessor : The memory system. **[5]**

b)   Explain the all Shift Rotate instructions in details.   **[5]**

P.T.O.

Q6) a) Explain all register set of the Pentium-4 microprocessor. [5]

    b) Explain DO-WHILE, REPEAT-UNTIL instructions. [5]

Q7) a) Explain WAIT, LOCK Prefix and ENTER and LEAVE instructions in details. [5]

    b) Explain Short, Near and Far Jump with proper example. [5]

Q8) Write Short Note on (any one) : [5]

    a) BOUND instruction

    b) Hyper Threading Technology

    c) Interrupt Vector Table

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S.E. (Computer Science and Engineering) (Semester - IV)
Examination, November- 2018
AUTOMATA THEORY
Sub. Code : 63531

Day and Date : Monday, 12 - 11 - 2018   **Total Marks : 50**
Time : 9.30 a.m. to 11.30 a.m.

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 whererver necessary.
5) Figures to the right indicate full marks.

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

a) Write a language for the given regular expression:

i) $(b+(b^*ab^* \ ab^*))^*$

ii) $(0+1)^* \ 101(0+1)^*$

b) Draw DFA for the regular expression $(11+10)^*$.

c) Using following grammar, Give leftmost & rightmost derivation of the string: 000110.

$S \rightarrow T_1 T_2$

$T_1 \rightarrow 0T_1 | 1$

$T_2 \rightarrow 1T_2 | 0$

d) Convert the given Grammar into Chomsky Normal Form (CNF)
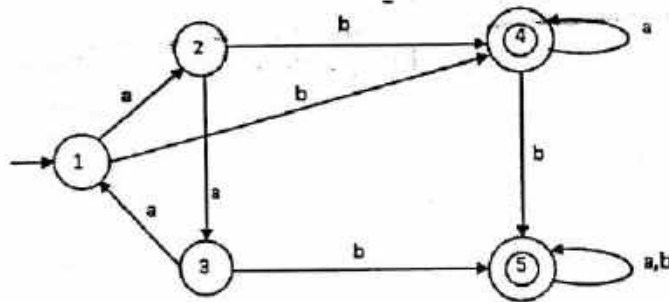
$S \rightarrow SAB|AB|SBC$

$A \rightarrow AB|a$

$B \rightarrow BAB \ |b$

$C \rightarrow CBA|c$

P.T.O.

Q2) a) Find the context free grammar for the language. [6]

    i) $L = \{a^i b^j a^i \mid i \geq 0, j \geq 1\}$

    ii) $L = \{0^i 1^j 0^k \mid j > i + k\}$

  b) Describe non deterministic finite automata with A transition & recursive definition for extended transition function of NFA-A. [4]

Q3) a) Write CFG for the language containing strings with more a's than b's. [4]

  b) Design minimum state FA for the following FA: [6]

Q4) Solve any three questions: [15]

  a) Prove pumping lemma for context free language.

  b) Design Turing machine for $L = \{x \mid x \in \Sigma^*$ and ends with aba. $\Sigma = \{a, b\}\}$.
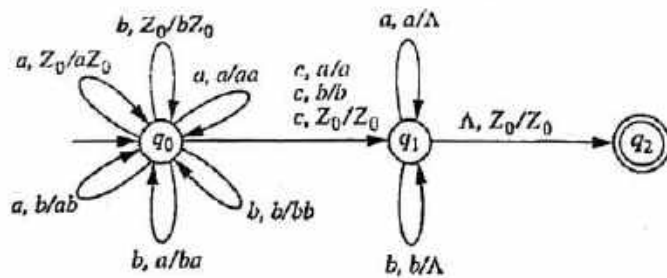
  c) For following PDA:

    Find sequence of moves of PDA by which string "abbcbba" is accepted.

  d) Define following Terms:

    i)   Acceptance of a string by Turing Machine.

    ii) Configuration of PDA.

-2-

Q5) a) Design Bottom-up PDA for following Grammar: [7]

S→AB

A→aA|a

B→ bB|b

b) Design PDA for $L=\{x | x \in \sum^*, \sum=\{a,b\}$ and number of 'a' and 'b' are equal. [3]

Q6) a) Design Turing Machine to replace all ending 'a' in the given string on tape with 'A'. Finally tape head must be on Starting Δ symbol when the machine is in h_a state. [6]

(For example if the string is "abbabaaaa" then Turing machine must convert it to "$\underline{\Delta}$ abbabAAAA". Assume $\sum=\{a,b\}$).

b) What is Universal Turing Machine? [4]

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S.E. (CSE) (Semester - IV) Examination, November - 2018
COMPUTER ORGANIZATION
Sub. Code : 63533

Day and Date : Wednesday, 14 - 11 - 2018   Total Marks : 50
Time : 09.30 a.m. to 11.30 a.m.

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.

Q1) a)   What is IC?   [1]
      b)   Explain Second Generation Computer.   [6]
      c)   Explain AMD processor.   [6]

Q2) a)   Explain basic adders and subtracters.   [6]
      b)   Explain High Speed adders.   [6]

Q3) a)   Design GCD processor using one hot method.   [6]
      b)   Draw a neat diagram of the accumulator based CPU showing control
          points. Write control signal definition.   [6]

Q4) a)   Explain control field encoding and encoding by function.   [6]
      b)   What is WCM? Explain Parallelism in microinstruction. [7]

Q5) a)   Explain user and supervisor modes. Draw the flow chart of overview of
          CPU behavior.   [6]
      b)   Explain Instruction Types.   [6]

Q6) a)   Explain Non preemptive allocation.   [6]
      b)   Explain FIFO and LRU replacement policies for the paging system in
          which M1 has a capacity of 3 pages. The execution of a program Q
          requires reference to five distinct pages P_i, i < = 5 and i is page address.
          The page address stream formed by executing Q is   [6]
          2 3 2 1 5 2 4 5 3 2 5 2

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Seat
No.

S.E. (CSE) (Semester - IV) (Revised) Examination,
November - 2018
OPERATING SYSTEM - I
Sub. Code : 63534

Day and Date : Thursday, 15 - 11 - 2018   Total Marks : 50
Time : 09.30 a.m. to 11.30 a.m.
Instructions: 1)   Questions no. 1 and 4 are compulsory.
                   2)   Attempt any ONE from Q.2 and Q.3 and any ONE from Q.5 and
                         Q.6.
                   3)   Figures to right indicate full marks.
                   4)   Assume suitable data if required.

Q1) a)   Differentiate between serial programming and multiprogramming in detail [6]

b)   Explain monolithic operating system in detail.   [7]

Q2) a)   What is PCB? Explain its contents in detail.   [6]

b)   What is a semaphore? Discuss its implementation.   [6]

Q3) a)   Draw and explain different types of schedulers.   [6]

b)   Write a note on multilevel feedback queue scheduling in detail.   [6]

Q4) a)   What is a page fault? Explain steps in handling a page fault.   [7]

b)   Explain deadlock avoidance in detail.   [6]

Q5) a)   Explain concept of resource allocation graph in detail   [6]

b)   Draw and explain TLB hardware for paging.   [6]

Q6) a)   With the help of suitable diagram explain concept of swapping.   [6]

b)   List and explain different operations on file.   [6]

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Seat
No.

S.E. (CSE) (Semester - IV) (Revised) Examination, November - 2018
SOFTWARE ENGINEERING
Sub. Code : 63535

Day and Date : Friday, 16 - 11 - 2018   Total Marks : 50
Time : 09.30 a.m. to 11.30 a.m.

Instructions :   1)   Attempt one question from Q1 and Q2.
                  2)   Q3 and Q6 are compulsory.
                  3)   Attempt one question from Q4 and Q5.

Q1) a)   Define the term Software Engineering. State and explain software quality
            attributes.   [6]

     b)   Briefly describe the association between the development process &
           management process with diagram.   [6]

Q2) a)   What is the goal of requirement analysis phase? Briefly describe the
            different ways in which analyst gathers requirement.   [6]

     b)   State the responsibilities and skills required by the Project Manager. [6]

Q3) a)   State the objective of the coding phase. Briefly explain some general
            coding standards adopted by software development organisation.   [6]

     b)   What is project planning? Explain briefly the principles of it.   [7]

Q4) a)   What is unit testing? Explain black box testing with example.   [6]

     b)   State the four major steps in structured design methodology. Explain the
           concept of coupling.   [6]

Q5) a)   Explain the process of getting ISO 9000 certificate.   [6]

     b)   Explain capability maturity model.   [6]

Q6) a)   What do you mean by quality control? State and briefly explain quality
            factors associated with software quality.   [6]

     b)   Explain system testing in detail.   [7]

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

Examination, November - 2018

COMPUTER NETWORK (New) (Revised)

Sub. Code : 63532

Day and Date : Tuesday, 13 - 11 - 2018

Total Marks : 50

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

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

SECTION - I

Q1) a) With neat diagram explain Distance vector routing algorithms. [6]

b) With context to routing within a datagram network discuss about implementation of Connection-Oriented Service. [6]

Q2) a) With proper example write about the notations used in Ipv4. [6]

b) Discuss about which problem solved by Network Address Translation (NAI) and how. [6]

Q3) a) Write a short note : [9]

i) Flow control and Buffering.

ii) Jitter Control

iii) Optimality Principal

b) Explain how Hop-by-Hop Choke Packets technique is used for Congestion Control in Datagram Subnets. [4]

P.T.O.

SECTION - II

Q4) a) With neat diagram explain TCP connection establishment and TCP connection release. [7]

b) Explain the send system call regarding socket programming. [5]

Q5) a) In brief explain Simple Mail Transfer Protocol (SMTP). [4]

b) In brief explain File Transfer Protocol (FTP). [3]

c) With proper example write a short note on RSA algorithm. [6]

Q6) a) In brief explain remote login. [6]

b) Explain following with proper example. [6]

   i) Substitution Cipher

   ii) Transposition Ciphers

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