Seat No.	

S.E. (Computer Science and Engineering) (Semester-III) Examination, May - 2017

APPLIED MATHEMATICS (Theory)

Sub. Code : 63524

Day and Date : Friday, 12-05-2017 **Total Marks : 50**
Time : 2.00 p.m. to 4.00 p.m.

Instructions : **1) Attempt any two question from each section.**
2) Use of non-programmable calculator is allowed.

SECTION-I

Q1) Attempt any two. **[12]**

a) Find equation of regression of Y on X using following data.

No. of workers (X)	12	14	16	17	18	19	18
production (Y)	405	650	715	955	1040	1110	1020

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

$$\int_0^{\pi} (x - \cos x)\, dx$$

c) Determine root of following equation correct up to four decimal places using Newton-Raphson Method

$\log x + x^2 = 0$

Q2) Attempt any two. **[12]**

a) Ten per cent of the USB cables produced by the company are defective. If the quality control engineer select 10 such cables and inspect them find probability that

i) Half of the samplecables are defective.

ii) Samplesselected contain at leastone defective cable.

b) Number of defects in a circuit board has poisson probability distribution with mean 4, find $p(X \geq 2)$ and $p(2 \leq X < 4)$

c) Marks obtained by a student are normally distributed with mean 55 and std. dev. 5. If 1000 students appear in an examination

i) how many students will get marks more than 40?

ii) how many students will get marks in between 45 to 50?

Area under normal curve from 0 to 3 is 0.4987
Area under normal curve from 0 to 2 is 0.4773
Area under normal curve from 0 to 1 is 0.3413

P.T.O.

Q3) a) Fit poisson probability distribution for following data and find expected frequencies **[6]**

x	0	1	2	3	4	5
f	15	48	55	22	10	5

b) Find the equation $y = a+bx+cx^2$ using following data **[7]**

x	0	1	2	3	4	5
y	2	8	15	25	40	60

SECTION-II

Q4) Following table represent profit earned by workers from different jobs. Find assignment schedule to maximize profit. **[12]**

		Jobs			
		A	B	C	D
Worker	I	5	4	8	6
	II	4	2	5	4
	III	9	5	8	5
	IV	8	1	7	3

Q5) a) Explain difference between crisp set and fuzzy set. **[3]**

b) Define **[2]**

i) α–cut ii) Height of fuzzy set

c) Define degree of subset hood of fuzzy sets and find S(A, B) and S(B, A) **[8]**

if $A(x)=\frac{0.3}{x_1}+\frac{0.9}{x_2}+\frac{0.7}{x_3}+\frac{0.6}{x_4}+\frac{0.1}{x_5}$ and

$B(x)=\frac{0.2}{x_1}+\frac{0.4}{x_2}+\frac{0.5}{x_3}+\frac{0.7}{x_4}+\frac{0.9}{x_5}$

Q6) Attempt any two. **[12]**

a) Find α–cut and strong α–cut for α = 0.5, 0.6, 0.8 for the fuzzy set defined by

$$C(x)=\frac{x}{x+1},$$

b) If $A(x)=\frac{0.8}{5}+\frac{0.5}{4}+\frac{0.7}{3}+\frac{0.3}{2}+\frac{0.1}{1}$ and $B(x)=\frac{1}{1}+\frac{0.8}{2}+\frac{0.7}{3}+\frac{0.6}{4}+\frac{0.5}{5}$

Find $A \cup B$ and $\overline{A \cap B}$

c) If $A(x)=\frac{x+2}{2}\ -2 \le x \le 0$; $A(x)=\frac{2-x}{2}\ 0 \le x \le 2$ and

$B(x)=\frac{x-2}{2} 2 \le x \le 4$; $B(x)=\frac{6-x}{2}\ 4 \le x \le 6$

Find (A – B)x.

Seat No.	

S.E.(Computer Science and Engg.) (Part-II) (Semester-III) (New Course) (Theory) Examination, May - 2017

DISCRETE MATHEMATICAL AND STRUCTURES

Sub. Code : 63525

Day and Date : Monday, 15-05-2017 **Total Marks : 50**

Time : 2.00 p.m. to 4.00 p.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 PCNF and PDNF of the following without constructing Truth Table. **[4]**

$(\neg P \rightarrow R) \wedge (Q \leftarrow\rightarrow P)$

b) Show that **[4]**

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

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) $A=\{a,\beta\}$ $B = \{1,2,3\}$ what are A X B, BX A, B XB, $(AXB) \cap (BXA)$ **[4]**

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

c) Demonstrate that R is a valid inference from the premises $P \rightarrow Q$, $Q \rightarrow R$, 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]**

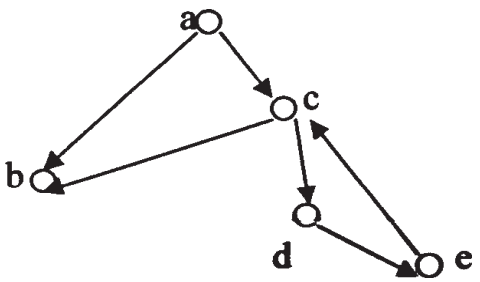
b) Three dice were rolled. Given that no two faces were the same, what is the probability that there was an ace? **[6]**

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

Seat No.	

S.E. (Computer Science Engineering) -I (Semester-III) (Revised) Examination, May - 2017
DATA STRUCTURES (Theory)
Sub. Code : 63526

Day and Date : Tuesday, 16-05-2017 **Total Marks : 50**
Time : 2.00 p.m. to 4.00 p.m.

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

Q1) a) Write Algorithm for Merge Sort. **[6]**

OR

a) With help of suitable example, explain working of Selection Sort. **[6]**
b) Comment on the complexity of Merge Sort and Insertion Sort. **[4]**
c) Explain technique to access array elements using pointer. **[4]**

Q2) a) Explain PUSH and POP Operation on Stack in detail. **[4]**
b) What is Hashing? Explain Chaining Operations. **[4]**
c) Write a short note on Priority Queue. **[3]**

Q3) a) Explain algorithm for inserting a new node in the end of doubly linked list. **[6]**

OR

a) Write algorithm for deleting a node from the end of circular linked list. **[6]**
b) Write Depth First Traversal Algorithm for Graph. Explain the algorithm with suitable example. **[8]**

OR

b) Explain different scenarios for inserting a new node in the AVL Tree. **[8]**

Q4) a) Explain the structure of B-Tree. **[4]**
b) What is path matrix? How to calculate path matrix of different length? **[4]**
c) Explain recursive algorithm for In-order traversal of binary tree. **[3]**

Seat No.	

S.E. (Computer Science and Engineering) (Part-II) (Semester-III) (Revised) Examination, May - 2017
DATA COMMUNICATIONS (Theory)
Sub. Code : 63527

Day and Date : Wednesday, 17-05-2017 **Total Marks : 50**
Time : 2.00 p.m. to 4.00 p.m.

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

SECTION-I

Q1) a) With a neat diagram, explain about Simplex, Half-duplex and Full-duplex. **[6]**

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

Q2) a) Discuss about the four types of noise. What is SNR? **[6]**

b) Explain about Differential Manchester line coding scheme. Draw diagram for 0100110100 using Differential Manchester scheme. **[6]**

Q3) a) Write a short note on Coaxial Cable with diagram. What are the applications of coaxial cable. **[7]**

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

i) Repeaters

ii) Bridges

iii) Routers

P.T.O.

SECTION-II

Q4) a) Explain CRC code for C(7, 4) in detail. **[7]**

b) Explain sliding windows protocol in detail. **[6]**

Q5) a) Difference between CSMA and CSMA/CD Protocol. **[6]**

b) Explain configuration of HDLC in detail. **[6]**

Q6) a) Design the Stop-and-Wait ARQ Protocol for Noisy channels in detail. **[7]**

b) Explain 802.6 standard (DQDB) and 802.2 logical link. **[6]**

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S.E. (Computer Science and Engineering) (Semester-III) (Revised) (Theory) Examination, May - 2017

MICROPROCESSOR

Sub. Code : 63528

Day and Date : Thursday, 18-05-2017 **Total Marks : 50**
Time : 2.00 p.m. to 4.00 p.m.

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

SECTION-I

Q1) a) With the help of block diagram explain architecture of 8085 microprocessor. **[7]**

b) Calculate starting and ending address of each segment located by the following segment register values in real mode. **[6]**

i) 1234H

ii) AB00H

iii) E000H

Q2) a) Write an 8085 assembly language program to transfer a data block of 5 bytes in reverse order from source address C200H to destination address C300H. **[6]**

b) Draw and explain the execution of PUSH and POP instruction in stack addressing mode. **[6]**

Q3) Write short note on: **[4+4+4]**

a) Real mode memory addressing

b) Data addressing mode

c) EFlag register

P.T.O.

SECTION-II

Q4) a) Explain the following instructions. **[6]**

i) IMUL

ii) DAA

iii) DIV

b) Explain 80386 Protected mode addressing using segment register as a selector with neat diagram. **[7]**

Q5) a) Draw and explain internal structure of the Pentium pro microprocessor. **[6]**

b) Explain different forms of JMP instructions. **[6]**

Q6) Write short note on: **[4+4+4]**

a) Virtual 8086 mode

b) Hyper threading technology

c) Paging unit (PU) in Pentium

Seat No.	

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

Day and Date : Tuesday, 25-04-2017 **Total Marks : 50**
Time : 9.00 a.m. to 11.00 a.m.

Instructions :
1) **Q. No.1 & Q.No.4 are compulsory.**
2) **Solve any one questions No.2 & question No.3.**
3) **Solve any one question 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) Design a DFA for language over $\sum = \{a,b\}$ and strings containing substring "babab".

b) What is a Regular Language? Write any two examples of regular expression and associated strings in that language.

c) Describe Nondeterministic Finite Automata with $\wedge$ transitions giving suitable example.

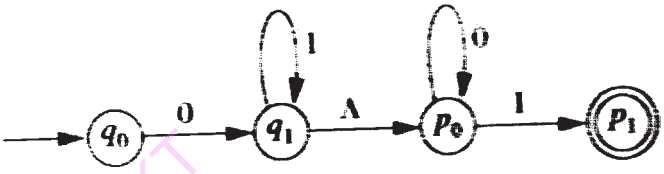
d) Convert the following grammar to its Chomsky Normal Form.

$S \rightarrow bA|aB$

$A \rightarrow bAA|aS|a$

$B \rightarrow aBB|b$

Q2) a) Obtain NFA from following NFA-$\wedge$ **[4]**

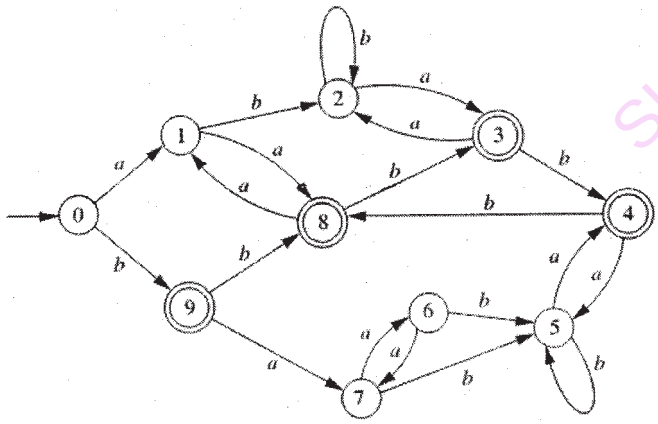


b) Prove that if L_1 and L_2 are context free languages, then $L_1 \cup L_2$ and * are also Context free Languages. **[6]**

P.T.O.

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

b) Find a minimum-state FA for the following FA. **[6]**



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

a) Draw PDA for following language:
$L=\{XcX^R | X \in \{a,b\}^*\}$

b) Write the proof of pumping Lemma for Context-Free Languages.

c) Draw Turing Machine for following language:
$L=\{X|X \in \{a,b\}^*$ and length of string X is even$\}$

d) Write short note on "Universal Turing Machine".

Q5) a) Write moves for a Top-down PDA for following CFG **[6]**
$S \rightarrow a \mid aS \mid bSS \mid SbS \mid SSb$

b) Define following terms: **[4]**
i) PDA
ii) Acceptance of a string by a PDA.

Q6) a) Define Computation of a function using Turing Machine. Draw Turing Machine to compute 'remainder mod 2". **[7]**

b) Describe Turing Machine. **[3]**

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Total No. of Pages :2

Seat No.	

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

Day and Date :Thursday, 27 - 04 - 2017 **Total Marks : 50**
Time :9.00 a.m. to11.00 a.m.

Instructions :
1) **Attempt any one question from Q.4 to Q.5.**
2) **Q.6 is compulsory.**
3) **Solve any two questions from each section.**
4) **Figures to the right indicate full marks.**

SECTION-I

Q1) a) Write an algorithm for Dijkstra Shortest Path Algorithm. **[6]**

b) What is "Count to infinity" problem? How this problem is solved in link state routing? Write only names of five parts. **[6]**

Q2) a) Change the following IPv4 addresses from binary notation to dotted-decimal notation. **[6]**

i) 10000001 00001011 00001011 11101111

ii) 11000001 10000011 00011011 11111111

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

Q3) a) With explanation write about any Two policies that cause congestion in data link layer. **[4]**

b) Explain about admission control technique used Congestion Control in Virtual-Circuit subnets. **[3]**

c) With neat diagram write a short note on Leaky Bucket Algorithm. **[6]**

P.T.O.

SECTION-II

Q4) a) Explain the Berkeley Sockets Primitive for TCP. **[7]**

b) Draw and explain the Encryption model. **[6]**

Q5) a) Explain the addressing scheme of transport connection. **[6]**

b) List and explain the DNS Resource Record types for IPV4. **[7]**

Q6) Write short note on (any three): **[12]**

a) Electronic Mail.

b) Name Server.

c) Forbidden region.

d) Multiplexing.

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Total No. of Pages : 2

Seat No.	

S.E. (CSE) (Part - II) (Semester - IV) (Theory) Examination, April - 2017

COMPUTER ORGANIZATION

Sub. Code : 63533

Day and Date : Saturday, 29 - 04 - 2017 **Total Marks : 50**

Time : 9.00 a.m. to 11.00 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) Write down all decimal codes equivalent to decimal digits 0 to 9. **[6]**

b) Illustrate floating point addition algorithm for **[7]**

X = 0 01111111 100000000000000.....00000 (32 Bit)

Y = 0 10000111 001010110100000.....00000 (32 Bit)

Q2) a) Compare the First, Second and Third generation of computer. **[6]**

b) Explain AMD Processor. **[6]**

Q3) a) Explain overview of CPU behavior. What are user and supervisor modes? **[6]**

b) Explain Error detection and correction logic. **[6]**

Q4) a) Write HDL description of the multiplier for 8-bit two's complement fractions. **[6]**

b) Explain GCD Processor with example. **[7]**

P.T.O.

Q5) a) Explain Wilkes basic structure of a micro programmed control unit. **[6]**

b) Explain control field formats. **[6]**

Q6) a) Explain memory types. **[6]**

b) Explain structure of an associative memory. **[6]**

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Seat No.	

S.E. (Computer Science and Engineering) (Part - II) (Semester - IV) (Revised) Examination, May - 2017

OPERATING SYSTEM - I

Sub. Code : 63534

Day and Date : Wednesday,03-05-2017 **Total Marks :50**

Time : 9.00 a.m. to 11.00 a.m.

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

SECTION - I

Q1) a) What are the fundamental principles/ functions of an Operating System? **[6]**

b) Distinguish between Batch and Multiprogramming operating systems. **[7]**

Q2) a) Explain monolithic operating system. **[7]**

b) In a typical operating system structure, define policy and mechanism. **[5]**

Q3) a) What is PCB? Why it is required? What are its contents? **[6]**

b) What is context switching? What is the role of the dispatcher? **[6]**

SECTION - II

Q4) a) Carry out analysis of Round Robin Scheduling. **[6]**

b) Distinguish between Pre-emptive SJF and Non Preemptive SJF? **[7]**

Q5) a) Discuss the dining philosopher's problem. **[6]**

b) How are deadlocks characterized? Why a mutual exclusion condition is not considered? **[6]**

Q6) a) Why is safety algorithm used? What is the safe sequence? **[6]**

b) With the help of a diagram explain the concept of Paging. **[6]**

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Total No. of Pages : 2

Seat No.	

S.E.(Computer Science and Engineering)
(Semester-IV) (Revised) Examination, May - 2017
SOFTWARE ENGINEERING
Sub. Code : 63535

Day and Date : Friday, 05-05-2017 **Total Marks : 50**
Time : 9.00 a.m. to 11.00 a.m.

Instructions :
1) **Attempt one questions from Q. 1 and Q.2.**
2) **Q.3.and Q.6 are compulsory.**
3) **Attempt one question from Q.4 and Q.5.**

Q1) a) What is software development process model? Explain the iterative development model. **[6]**

b) Explain PCMM model with an appropriate figure. **[6]**

Q2) a) Define SRS and list desirable qualities of an SRS. Explain the functional requirements documentation in SRS. **[6]**

b) What is a formal technique? Explain the syntactic domain, semantic domain and satisfaction relation of a specification language. **[6]**

Q3) a) Explain the relationship between project management process and the development process with necessary figure. **[7]**

b) What is a project plan? Explain the different sections of a typical project plan. **[6]**

Q4) a) State the four major steps in structured design methodology. Explain DFD of an ATM. **[6]**

b) State and explain any 2 methods of complexity metrics for object oriented design. **[6]**

P.T.O.

Q5) a) What is code review? Explain code inspection technique. **[6]**

b) What is integration testing? Explain various approaches of integration testing. **[6]**

Q6) a) What is reliability of a software? Explain briefly six metrics that correlate with reliability. **[7]**

b) Explain briefly the process of getting ISO 9000 certification. **[6]**

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