Complete

No. of Printed Pages : 04 **Roll No. .....**

C3

B. Tech. EXAMINATION, 2020

(Third Semester)

(B Scheme) (Re-appear Only)

(CSE, ECE, IT)

CSE201B

DATA STRUCTURES

Time : 2½ Hours] *[Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. (a) Write an algorithm to evaluate postfix expression using stack.

(b) Consider following arithmetic expression P written in postfix notation :

P : 12, 7, 3, -, /, 2, 1, 5, +, *, +

Evaluate the expression P using Stack.

2. (a) Consider the following multidimensional array X(–5:5, 3:33), Y(3:10, 1:15, 10:20)

(i) Find the length of each dimension and number of elements in X and Y.

(ii) Suppose Base(Y) = 600 and w = 2. Find the effective indices E1, E2, E3 and address of Y[5, 12, 16] when Y is stored in Row Major order and when Y is stored in Column Major Order.

(b) Write an algorithm to insert an element into circular queue when queue is represented using linear array.

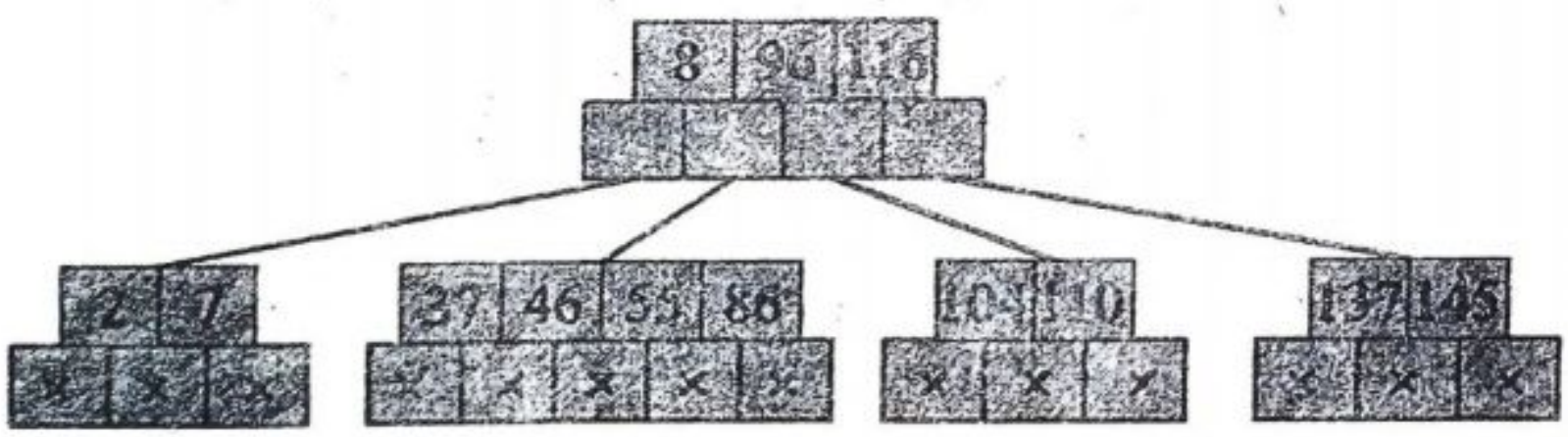
3. (a) Write an algorithm to insert an element between two nodes A and B with given location LOCA and LOCB in doubly linked list.

(b) Write an algorithm to search an element from unsorted Linked List.

4. (a) Write an algorithm to perform polynomial addition using linked list.

(b) What is garbage collection and free pool ? How is it implemented ?

5. (a) What is a B-tree ? Consider a B tree of order 5 :



(i) Insert elements 4, 5, 58, 6 in order. Show the tree obtained after each insertion.

(ii) Delete 96, 104, 145, 58 in order and show the tree obtained after each deletion.

(b) What is a threaded tree ? Illustrate with the help of diagram.

6. (a) Write an algorithm to perform graph traversal using depth first search.

(b) Write Warshall's algorithm to find shortest path on graph.

7. (a) Sort an array 79, 37, 44, 15, 22, 66, 55, 90, 49, 62, 94, 88 using quicksort.

(b) Write an algorithm to perform binary search.

8. (a) Perform Merge sort an array 66, 33, 40, 22, 55, 88, 60, 11, 80, 20, 50, 44, 77, 30.

(b) Sort the given array using selection sort :

44, 30, 50, 22, 60, 52, 71, 57, 48, 36.

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C4

B. Tech. EXAMINATION, 2020

(Third Semester)

(B Scheme) (Re-appear Only)

(CSE)

CSE203B

DISCRETE STRUCTURE

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. A survey of 500 television viewers of a sports channel produced the following information : 285 watch cricket, 195 watch hockey, 115 watch football, 45 watch football and cricket, 70 watch cricket and hockey, 50 watch hockey and football and 50 do not watch any of the three kinds of games. How many viewers watch exactly one sports ? 265

2. What is equivalence relation ? Explain with example.

3. Define Graph. Explain directed and undirected graphs. Also explain planner and non-planner graphs.

4. Find in-order; pre-order and post-order traversal of the following tree in fig. 1 :

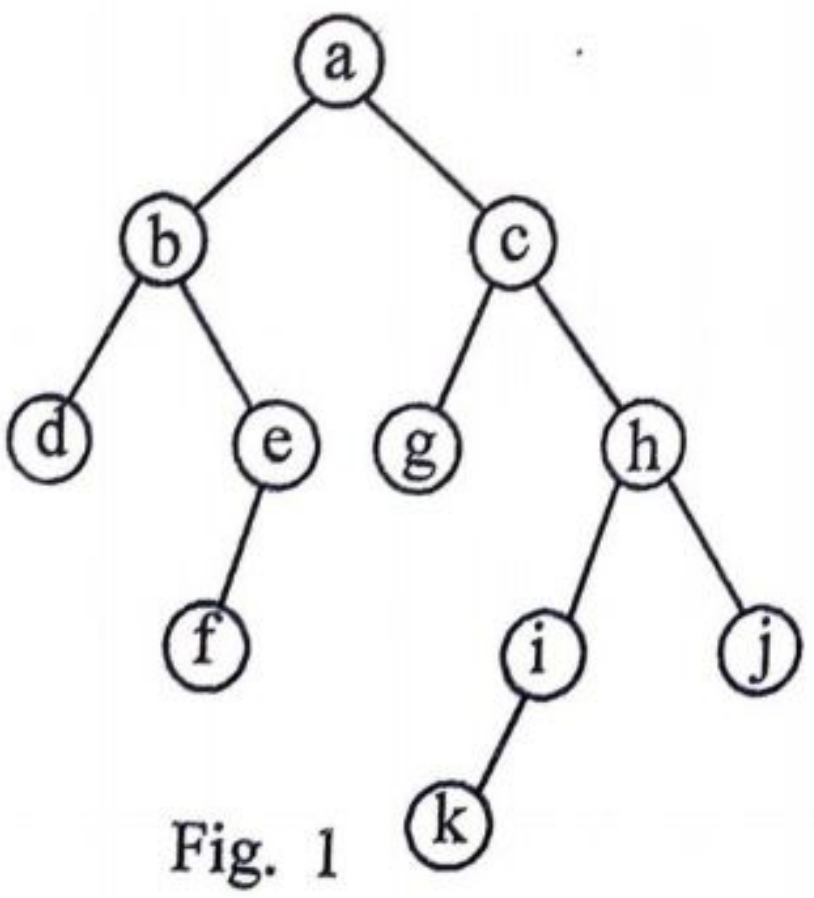

Fig. 1

5. Using resolution by refutation method find whether the following argument is valid :

No engineering student of first or second semester studies logic.

Anil is an engineering student who studies logic.

$\therefore$ Anil is not in second semester.

6. If G is a finite group and H is a subgroup of G, prove that the order of H divided the order of G.

7. Solve the following recurrency relation and indicate if it is a linear homogeneous relation or not. If yes, give its degree and if not justify your answer :

$$t_n = t_{n-1} + n,\ t_1 = 4$$

8. How many words of 4 letters can be formed with the letters a, b, c, d, e, f, g and h, when :

(i) e and f are not to be included

(ii) e and f are to be included.

No. of Printed Pages : 03 Roll No. .....

C5

B. Tech. EXAMINATION, 2020

(Third Semester)

(B Scheme) (Re-appear Only)

(CSE)

CSE205B

COMPUTER BASED NUMERICAL AND STATISTICAL METHODS

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. Explain the following :
   (a) Error Propagation
   (b) Fixed point iteration.

2. (a) What is Newton's method ? Explain Newton's method for non-linear system of equations.
   (b) Write short note on round off error.

3. (a) Explain interpolation with unequal intervals.
   (b) Give central difference interpolation formulas.

4. (a) What is averaging operator ?
   (b) Explain Hermite interpolation.

5. Explain the following :
   (a) Romberg integration
   (b) Newton's cotes formula.

6. (a) Explain Simpson's rules.
   (b) Give numerical differentiation using forward and backward difference formulas.

7. (a) Explain Chi-square test of goodness of fit.

   (b) Write down Bayes theorem and its applications.

8. Explain the following :

   (a) Conditional probability

   (b) Poisson and Normal distributions.

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D2

B. Tech. EXAMINATION, 2020

(Fifth Semester)

(B Scheme) (Re-appear Only)

(CSE)

CSE204B

OBJECT ORIENTED PROGRAMMING

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. Define the properties of constructor. Write down the syntax of different types of constructors available in C++. Give suitable example to illustrate your answer.

2. (a) Illustrate the relevance of different access specifiers available in C++. What is the effect of access specifiers on derivation mode in Inheritance ?

   (b) Why do we require a namespace ?

3. (a) Define the properties of friend function. Write a program to find largest of two objects of different classes to illustrate the relevance of friend function.

   (b) Write a program to overload + and – operators for class of complex numbers.

4. (a) Write a program to illustrate the use of static data members in class.

   (b) Explain the syntax and use of New and delete operators in C++.

5. (a) What is Inheritance ? With the help of suitable examples differentiate between different types of inheritance.

   (b) What is function overriding ?

6. (a) What is a virtual function ? Why is it needed ? What is the relevance of pure virtual function ? Write the syntax of pure virtual function.

   (b) What is an abstract base class ?

7. (a) What is an exception ? What is relevance of throw, catch and try keywords in exception handling ? Write a program to illustrate exception handling.

   (b) What are stream error states ?

8. What is a template class ? Write a program to create template for class stack and implement push and pop operations on it.

No. of Printed Pages : 05 Roll No. 16

E1

B. Tech. EXAMINATION, 2020

(Fifth Semester)

(B Scheme) (Re-appear Only)

(CSE)

CSE301B

OPERATING SYSTEMS

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. (a) Discuss the services provided by an operating system. How are system call implemented when a user program wants to use the services of an operating system ?

   (b) Differentiate between the single processor system and multi-processor system explaining the advantages and disadvantages of each.

2. Explain the different classes of operating system architectures.

3. (a) For each of the following transitions between process states, indicate whether or not the transition is possible. If it is possible, give an example of one thing that would cause it :

   (i) Ready -> run

   (ii) Ready -> swapped-blocked

   (iii) Ready -> held

   (iv) Blocked -> ready

   (v) Swapped-blocked -> swapped-ready.

(b) Differentiate between a process, program and a thread.

4. Consider the following processes :

Process	Arrival Time	Processing Time
A	0	5
B	2	4
C	2	2
D	4	4

Draw a chart illustrating their execution using :

(a) First come first served

(b) Shortest Job First

(c) Round Robin (Quantum = 2)

(d) Round Robin (Quantum = 1).

Calculate the average response time and average turnaround time for each scheduling strategy. Which strategy offers the best turnaround time and response time ?

5. (a) What is the difference between internal fragmentation and external fragmentation ? Which one occurs in paging systems ? Which one occurs in systems using pure segmentation ? Explain.

(b) What is demand paging ? Given references to following pages by a program :

0, 9, 0, 1, 8, 1, 8, 7, 8, 7, 1, 2, 8, 2, 7, 8, 2, 3, 8, 3

How many page faults will occur if the program has three frames available to it and uses :

(i) LRU replacement

(ii) Optimal replacement.

6. (a) Why is disk scheduling important ? Explain the following terms related to disk scheduling.

Seek time, rotational latency, transfer time, disk access time.

(b) What are the advantages of using a file allocation table in implementing files ?

7. (a) What are the necessary conditions for a deadlock to occur ?

(b) Is the following state safe or unsafe ? Explain.

Process	Current Allocation		Maximum Allocation		Resources Available	
	R1	R2	R1	R2	R1	R2
P1	7	2	9	5	2	1
P2	1	3	2	6		
P3	1	1	2	2		
P4	3	0	5	0		

8. (a) Draw and explain the architecture of windows operating system.

(b) What is critical section problem ? How Semaphores can be used to solve the critical section problem ?

No. of Printed Pages : 03 Roll No. .....17.....

E2

B. Tech. EXAMINATION, 2020

(Fifth Semester)

(B-Scheme) (Re-appear Only)

(Common with IT-VI Sem.)

CSE303B

COMPUTER GRAPHICS

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. Write and explain the Bresenham's algorithm for drawing a circle. Also iterate the steps of the algorithm for some example.

2. Define the term "Solid area scan conversion". Develop an algorithm to scan convert a Polygon. Explain the working of this algorithm with suitable example.

3. (a) Find the normalization transform that maps a window whose left corner is at (1, 1) and upper right corner is at (3, 5) onto a viewport that is :

   (i) entire normalized device screen

   (ii) a viewport that has lower left corner at (0, 0) and upper right corner (1/2, 1/2).

   (b) A mirror is placed vertically such that it passes through the points (10, 0) and (0, 10). Find the reflected view of the triangle ABC with Co-ordinates A(5, 50), B(20, 40), C(10, 70).

4. Write and explain the Sutherland-Hodgeman polygon clipping algorithm. Explain, why this algorithm will work for convex clipping regions ?

5. Using the origin as centre of projection, derive the perspective transformation onto a plane passing through the point $R_0(x_0, y_0, z_0)$ and having normal vector $N = n_1I + n_2J + n_3K$.

6. Write and explain the scanline algorithm for hidden surface removal.

7. (a) Why did we say that red, green and blue only roughly coincide with the wavelength values that causes peak response from three types of color sensitive cones ?

   (b) Describe the Phong shading model.

8. Compare the Bezier, B-Spline and Lagrange's interpolation techniques.

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E3

B. Tech. EXAMINATION, 2020

(Fifth Semester)

(B. Scheme) (Re-appear Only)

CSE, IT

CSE305B

COMPUTER NETWORKS

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. What is Computer Network ? Explain different types of network topologies.

2. Differentiate the following :
   (a) Public and Private Network
   (b) OSI/TCP/IP Model.

3. Differentiate the following :
   (a) TCP/UDP
   (b) ARP/RARP.

4. Explain the following :
   (a) SMTP
   (b) POP
   (c) ICMP.

5. What is LAN ? Explain features, components and usage of LAN.

6. Explain the following :
   (a) Aloha
   (b) CSMA/CD
   (c) Routers.

7. Explain the following :

   (a) DQDB

   (b) SONET.

8. Write short notes on the following :

   (a) Digital Signature

   (b) Proxy Servers.

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E4

B. Tech. EXAMINATION, 2020

(Fifth Semester)

(B Scheme) (Re-appear Only)

CSE, IT

CSE307B

ANALYSIS AND DESIGN OF ALGORITHMS

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. Write selection sort algorithm. Sort the following by using selection sort :
68, 84, 56, 126, 36, 203, 27, 98, 87.
Also discuss its merits and demerits.

2. (a) Why worst case analysis of algorithms is most important than average case analysis ?

(b) Explain various asymptotic methods used to represent the rate of growth of running time of algorithms.

3. Explain the Greedy Method. Write the elements of Greedy. Programming strategy. Solve the 0/1 knapsack problem using Greedy method.

4. (a) What is minimum spanning tree ? Explain.

(b) What is dynamic programming ? Write algorithm. By using this method find the optimal solution of 0/1 knapsack problem.

5. What is Back Tracking ? Solve 8 queen's problem using back tracking.

6. Explain the following :

   (a) Hamiltonian cycle

   (b) Branch and Bound.

7. What is NP hard and NP complete problems ? Discuss in detail.

8. Write short notes on the following :

   (a) Cook's Theorem

   (b) NP scheduling problem.

No. of Printed Pages : 05 Roll No. .....20.....

E5

B. Tech. EXAMINATION, 2020

(Fifth Semester)

(B-Scheme) (Re-appear Only)

(Common with IT-VI-Sem.)

CSE309B

THEORY OF AUTOMATA AND COMPUTATION

Time : 2½ *Hours*] [*Maximum Marks* : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

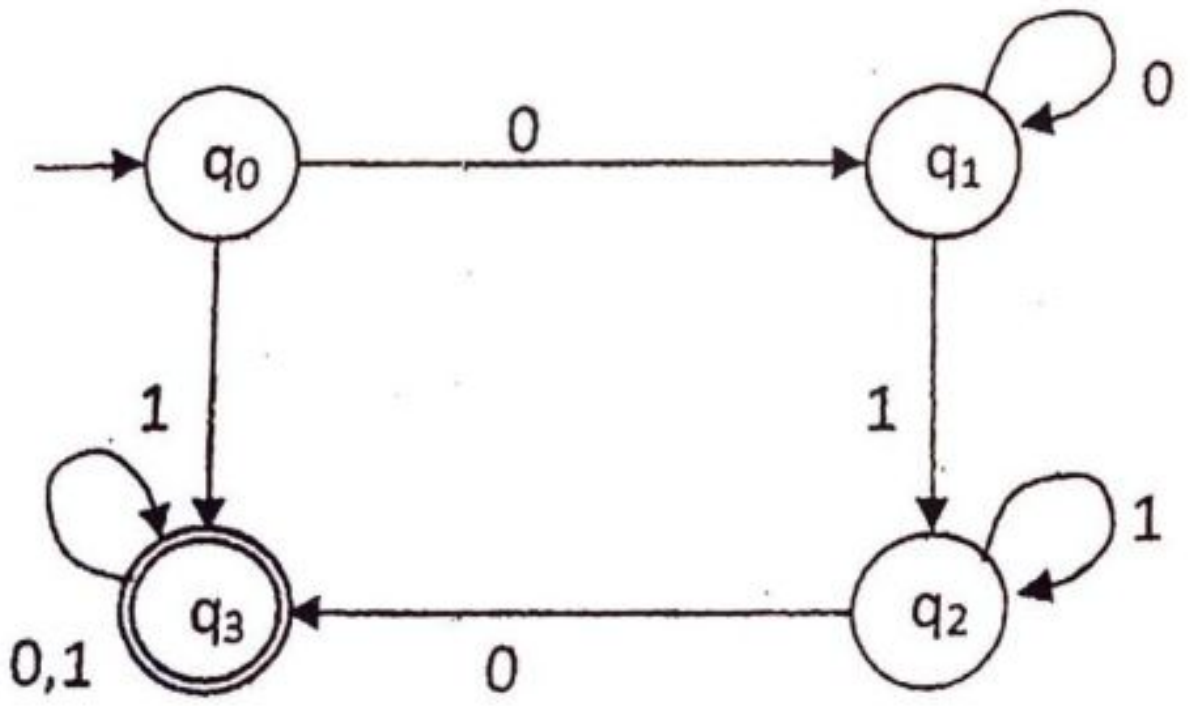
Note : Attempt *Four* questions in all. All questions carry equal marks.

1. (a) Design a FA over alphabet $\Sigma = \{a, b\}$, which accepts the set of strings that either start with 01 or end with 01.

(b) Consider the following ε-NFA and convert it to an equivalent DFA :

	ε	a	b	c
$\rightarrow p$	$\{q,r\}$	$\emptyset$	$\{q\}$	$\{r\}$
q	$\emptyset$	$\{p\}$	$\{r\}$	$\{p, q\}$
$*r$	$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$

2. (a) Construct a Regular Expression from the given Finite Automata using Arden's theorem.



(b) Construct a Mealy machine which calculates residue mod 4 for each binary string treated as binary integer.

3. Use Pumping Lemma to show that :

(a) $L = \{0^n 1^{2n}$, where $n >= 1\}$ is not regular.

(b) $L = \left\{a^{i^2} \mid i >= 1\right\}$ is not regular.

(c) Consider the DFA given by the transition table below and use Myhill-Nerode theorem to construct the minimum state equivalent DFA.

	0	1
$\rightarrow q_1$	q_2	q_3
q_2	q_3	q_5
$*q_3$	q_4	q_3
q_4	q_3	q_5
$*q_5$	q_2	q_5

4. (a) Convert the following grammar into GNF clearly specifying the steps used.

$S \rightarrow XY$

$X \rightarrow YS \mid b$

$Y \rightarrow SX \mid a.$

(b) Show that $L = \{ww \mid w \in (a, b)^*\}$ is not context free.

5. (a) Construct a PDA to accept the language $L = \{a^n\ b^{n+m}\ c^m \mid n, m > 0\}$ by empty stack and by final state.

(b) Explain Halting problem of Turing Machines.

6. (a) Design a Turing Machine to perform the concantenation operation on two strings w_1 and w_2, each consisting of string of ls. Show an ID for $w_1 = 111$ and $w_2 = 1111$.

(b) Design a Turing Machine to accept the language $L = \{a^n\ b^{2n} | n > 0\}$.

(c) Give two uniques solutions of the following PCP :

i	1	2	3
X_i	110	0011	0110
Y_i	110110	00	110

7. (a) Categorize different types of grammars as per Chomsky hierarchy and also explain them.

(b) Write short note on Unrestricted Grammars.

8. (a) What are Primitive Recursive functions ? Show that the function $f(x, y) = x^y$ is primitive recursive.

(b) Explain composition of functions.

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F182

B. Tech. EXAMINATION, 2020

(Seventh Semester)

(B. Scheme) (Main & Re-appear)

(CSE, IT)

IT304B

SOFTWARE TESTING

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. (a) What is a decision table ? Take example of a program that take three sides of a triangle as input and checks for various types of triangles. Draw decision table for this example.

   (b) Explain the features of Equivalence Class Testing.

2. What are the different testing techniques in each phase of software development ?

3. What are essential things needed while performing beta testing ? Explain.

4. What are the various approaches for Integration Testing ? Explain the role of stubs and drivers in each one of these.

5. How is object oriented testing different from traditional testing ? Discuss object oriented integration in detail.

6. What are objectives of test case prioritization ? Also state some approaches for test case prioritization.

7. What is a test case ? What are its components ? Describe any *three* approaches for automated test case generation.

8. Write short notes on the following :

   (a) Regression Testing

   (b) Slicing types

   (c) Types of mutants.

No. of Printed Pages : 03 Roll No. 42

G16

B. Tech. EXAMINATION, 2020

(Seventh Semester)

(B-Scheme) (Main & Re-appear)

(CSE)

CSE457B

NETWORK SECURITY AND CRYPTOGRAPHY

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. Why is confidentiality an important principle of security ? Discuss different transposition techniques with the help of suitable examples.

2. Write short notes on the following :

   (a) Symmetric key cryptography

   (b) Steganography.

3. Differentiate between block cipher and stream cipher algorithms. Explain about single round of DES algorithm.

4. What is digital signature ? What is the important aspect that establishes trust in digital signatures ?

5. What is the purpose of SSL alert protocol ? Explain SSL handshake protocol briefly.

6. Write short note on the following :

   (a) Crypto currency

   (b) Importance of blockchain.

7. What do you mean by clear text passwords ? What are the problems associated with clear text passwords ?

8. Explain any *one* one-way authentication mechanism with its advantages and drawbacks.

No. of Printed Pages : 03 Roll No. 43

G20

B. Tech. EXAMINATION, 2020

(Seventh Semester)

(B-Scheme) (Main & Re-appear)

(CSE)

CSE465B

INFORMATION SECURITY AND DATA HIDING

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. What do you mean by Information Security ? What is the need to secure information ? Discuss different approaches to secure information.

2. Write short notes on the following :
   (a) Phishing
   (b) Digital Signature.

3. Explain LZW compression and decompression method in detail.

4. What is e-Mail security ? Discuss different practices against hacking.

5. What do you mean by Cryptography ? How is it different from Steganography and Digital Watermarking ?

6. (a) Discuss different applications of data hiding.
   (b) Explain LSB method of data hiding.

7. (a) Discuss advantages of wavelets. 7

(b) Differentiate between spatial and transform domain techniques.

8. Describe various copyright mechanism systems in detail.

No. of Printed Pages : 03 Roll No. 54

H1

B. Tech. EXAMINATION, 2020

(Eighth Semester)

(B. Scheme) (Re-appear Only)

(CSE)

CSE402B

DATABASE ADMINISTRATION

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. (a) What are the different steps in installing and upgrading Oracle ?

   (b) What do you mean by table space ? Explain various commands related to table space management.

2. (a) How do you manage users and security in Oracle ?

   (b) How do you create and manage database objects such as tables, views and indexes ?

3. Determine, why database backup is important and how it is accomplished ? How do you define and test a backup, restore and recovery strategy ?

4. What is performance tuning ? What are the requirements of performance tuning ? Explain its methodology.

5. Explain the need of different types of Cursors. Also explain their implementation with example.

6. What is PL/SQL ? How is it different from SQL ? Enlist the characteristics of PL/SQL and explain data types of PL/SQL.

7. Describe Data Warehouse. How to create Data warehouse in Oracle ?

8. Write short notes on the following :

   (a) ECA Rules

   (b) Active Databases.

No. of Printed Pages : 03 Roll No. 55

H2

B. Tech. EXAMINATION, 2020

(Eighth Semester)

(B. Scheme) (Re-appear Only)

(CSE)

CSE404B

SOFTWARE PROJECT MANAGEMENT

Time : 2½ Hours] *[Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. How is management of a software project different from other types of projects ? Explain. Also mention specific activities covered by SPM.

2. What is software project planning ? What are various steps of it ? Write tasks involved at each step.

3. What is V-model in SPM ? Why is it used ? Elaborate it phase of V-model.

4. (a) What is a critical path in SPM ? Describe the process to identify it.

   (b) What is precedence network ? How is established in SPM ?

5. Explain BCWS and CPI in context of project monitoring and control. Also discuss types of reviews in a software project.

6. What are different tools for managing and controlling resources in software project ? Write a detailed note.

7. What are various organizational structures ? Explain pros and cons of each.

8. Write short notes on the following :

   (a) Debugging techniques

   (b) Software quality

   (c) Validation *Vs.* Verification.

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H7

B. Tech. EXAMINATION, 2020

(Eighth Semester)

(B Scheme) (Re-appear Only)

CSE460B

GREEN COMPUTING

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. What is Green Computing ? Explain, how Green computing affects on cost saving ?

2. Explain various initiatives taken by industries to achieve Green computing.

3. Explain effective resources allocation for green computing.

4. Explain sustainable computing in detail.

5. Explain Green computing techniques to manage power and storage in computing system.

6. Explain various tools available for monitoring the green computing.

7. Write short notes on the following :

   (a) Material Recycling

   (b) Green Mobile.

8. Explain temporal and spatial data mining techniques in Green computing.

No. of Printed Pages : 03 Roll No. 59

H302

B. Tech. EXAMINATION, 2020

(Eighth Semester)

(B Scheme) (Re-appear Only)

(IT)

IT404B

LINUX ADMINISTRATION

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. List the commands along with syntax you can use to determine who is logged in at specific time interval.

2. (a) Draw the architecture of LINUX.

   (b) Explain the booting process of Linux operating system in detail.

3. (a) Compare the features of Vi Editor and Pico Editor.

   (b) Explain the userdel and usermod commands with options and arguments.

4. Explain, how you can get help on news and tutorials in Emacs editor. Also explain, how this information (help) is removed from buffer. Also explain, what you will get with the following commands in Emac editor
CONTROL-H a, CONTROL-H-b, CONTROL-H c, CONTROL-H k, CONTROL-H f, CONTROL-H i, CONTROL-H w.

5. List the directories that the / directory must contain. Explain the purpose of any *five*.

6. (a) List various network configuration files. Explain purpose of each.

   (b) Write a shell script to accept a filename. Check if the file exists and display the number of lines, words, and characters in the file. Display an appropriate message if the file is not present.

7. Briefly explain about DHCP. Write steps to configure the DHCP client.

8. List the different modes of network bonding in LINUX. Briefly explain each of these.

No. of Printed Pages : 04 Roll No. 60

18C1

B. Tech. EXAMINATION, 2020

(Third Semester)

(C Scheme) (Main & Re-appear)

(CSE)

CSE201C

DATA STRUCTURES AND ALGORITHMS

Time : 2½ Hours] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. What is a Data Structure ? What are the different categories of data structures ? Differentiate between static and dynamic implementations of data structures. What are the applications of different data structures ?

2. (a) Write an algorithm to search an element using binary search. What is the complexity of binary search algorithm ?

   (b) Explain time space trade off.

3. (a) Consider the following arithmetic expression P written in infix notation

   P : A + (B*C – (D/E^F)*G)*H

   Convert the expression P into postfix notation using Stacks.

   (b) Write an algorithm to evaluate postfix expression using stack.

4. (a) Write an algorithm to insert an element in queue when queue is implemented using linked list. What are the applications of queue ?

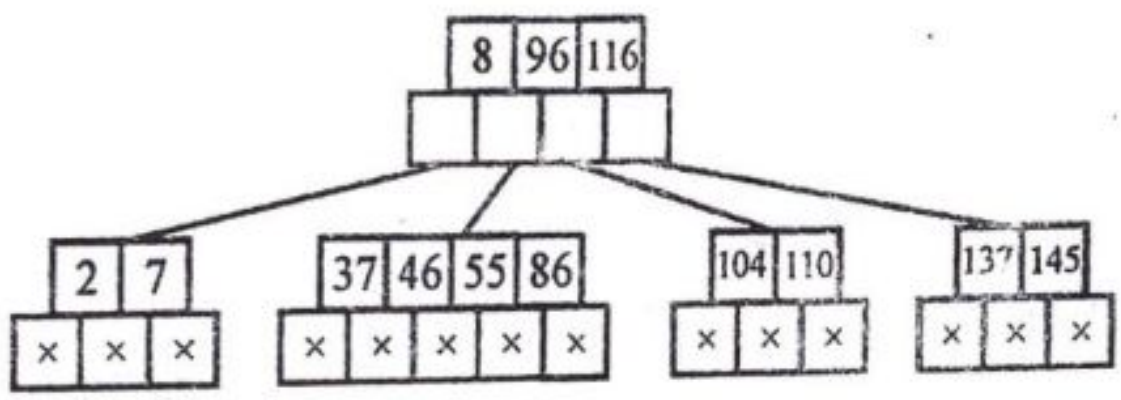
(b) What is circular queue ? Give suitable example for the same.

5. (a) Write an algorithm to insert an element into single linked list. What are the advantages of linked list over arrays ?

(b) Write an algorithm to delete an element with given location LOC from doubly Linked List.

6. (a) What is a B-tree ?

Consider a B tree of Order 5



(i) Insert elements 4, 5, 58, 6 in order. Show the tree obtained after each insertion.

(ii) Delete 96, 104, 145, 58 in order and show the tree obtained after each deletion.

(b) What is a threaded tree ?

7. (a) Explain depth first traversal of graph. Support your answer with an example. Write an algorithm for depth first traversal.

(b) Briefly describe an adjacency matrix with suitable example.

8. (a) Sort the given array using Heapsort :

44, 30, 50, 22, 60, 55, 77, 55

(b) Sort given array using bubble sort :

34, 45, 23, 11, 66, 57, 86, 98, 46

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18C3

B. Tech. EXAMINATION, 2020

(Third Semester)

(C Scheme) (Main & Re-appear)

(CSE)

ECE203C

DIGITAL SYSTEM DESIGN

Time : 2½ Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. (a) Simplify the following expression using Boolean algebra :

$$F = A + B\left[AC + \left(B + \overline{C}\right)D\right]$$

(b) Realize XOR function using NOR logic.

(c) Simplify the following expression using K-map and implement it using NAND Gates only :

$F = \Sigma m(0, 1, 4, 5, 6, 13, 14, 15, 22, 24, 25, 28, 29, 30, 31)$

2. (a) Reduce the following expression using 3-variable Map :

$$F = \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,\overline{B}CD + \overline{A}BC\overline{E} + \overline{A}B\overline{C}E + A\overline{B}C + ABC + AB\overline{C}\,\overline{D}$$

(b) Design and implement a BCD to Excess-3 code converter using suitable logic gates.

3. (a) Implement the following function using 8 : 1 MUX :

$$F = \Sigma m(0, 1, 3, 4, 5, 8, 9, 15)$$

(b) Design a full substractor using 3 : 8 decoder.

(c) Implement a 16 : 1 MUX using 4 : 1 MUX ICs.

4. (a) Design and implement a Mod-6 synchronous counter using J-K flip-flop.

(b) What is meant by universal shift register ? Explain the working of a 4-bit universal shift register with the help of its functional table.

5. (a) Design a serial binary adder using D flip-flop.

(5) a) what are advantages of PLD's over fixed function ICS?
b) Compare CPLD and FPGA.

(b) Design a sequence detector to detect the non-overlapping sequences 1011 and 1101. It generates output 1 when sequence is detected.

6. (a) Discuss the components and features of ASM chart.

(b) Draw an ASM chart and state table for a 2-bit up/down counter having mode control input M such that M = 1 for up counting and M = 0 for down counting. The circuit should generate output 1 whenever the count becomes minimum or maximum.

7. (a) Explain working of a two-input TTL NAND gate with the help of circuit diagram.

(b) How is propagation delay improved in totem-pole TTL logic ?

(c) What is current sinking logic ?

c) Design and implement 4-bit Binary to Gray code Converter using PLA.

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18E3

B. Tech. EXAMINATION, 2020

(Fifth Semester)

(C Scheme) (Main Only)

(CSE)

CSE305C

COMPUTER NETWORKS

Time : 2½ Hours] *[Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. Define Computer Networks. What are its advantages ? Explain various types of Computer Networks.

2. Explain OSI reference model with its block diagram.

3. What is IP addressing ? Explain and compare IPv4 and IPv6.

4. Write notes on the following :
   (a) SMTP
   (b) NNTP.

5. Explain features of LANs. Also explain the IEEE LAN standards.

6. Explain the following :

   (a) Ethernet

   (b) Gateways.

7. What do you mean by Congestion ? Explain any congestion control protocol.

8. (a) Explain DQDB.

   (b) Explain the concept of frame relay.

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18E5

B. Tech. EXAMINATION, 2020

(Fifth Semester)

(C Scheme) (Main Only)

(CSE)

CSE309C

SOFTWARE ENGINEERING

Time : 2½ Hours] *[Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. Many of the software projects are not able to see the light of day (*i.e.* abandoned in between). Why ? Write at least seven reasons. Be specific.

2. (a) Write any *five* main areas of concern in extreme programming.

(b) Write any *five* advantages of Agile development.

3. What do you mean by data modeling ? Write and explain three elements of data modeling.

4. (a) Do you design software when you write a program ? What makes software design different from coding ?

(b) Discuss the relationship between concept of information hiding as an attribute of effective modularity and concept of module independence.

5. (a) List any *five* objectives of software testing.

   (b) What are the challenges faced during testing of Real Time Systems ? Propose and elaborate a strategy.

6. (a) There is a subtle difference between restructuring and forward engineering. What is it ? Justify your answer.

   (b) Write any *five* features of a good software interface.

7. Explain the six areas of the provisions of ISO-9126 Quality standard.

8. Differentiate between an SCM audit and a technical review. Can their function be folded into one review ? List the pros and cons.