17.5.18 (E)

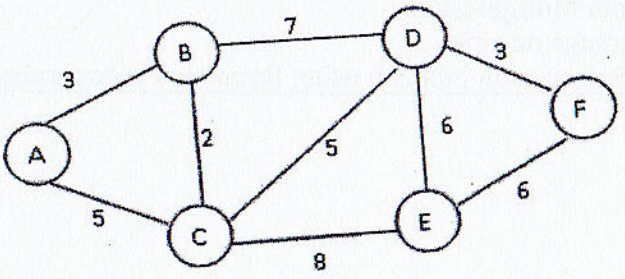
K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

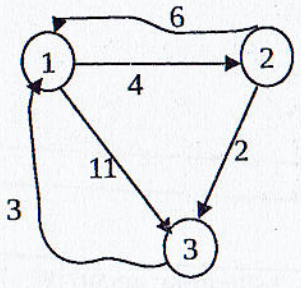
End Semester Examinations
May - June 2018

Duration: 3hrs
Semester: IV

Max. Marks: 100
Class: S.Y.
Name of the Course: Analysis of Algorithm
Branch: COMP
Course Code: UCEC403

Instructions:
(1) All Questions are Compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Question No.		Marks
Q 1 (a)	Determine the time complexity of following recursive function, using Recursion tree method. $T(n) = 4\,T(n/2) + n^2$	05
Q 1 (b)	Write an algorithm of Selection sort and derive its time complexity	05
Q1 (c)	Derive Time complexity of Quick Sort algorithm (Best case and worst case). Sort the following given elements using Quick sort. Show all passes. 85, 36, 87, 10, 91, 18, 15, 52	10
Q2 (a)	Explain Job sequencing with deadlines algorithm. For the given jobs, its profit and deadlines, find the feasible solution. N=4 (P1, P2, P3, P4)= (100, 10, 15, 27) (d1, d2, d3, d4)=(2, 1, 2, 1) **OR** Write an algorithm of Kruskal's method to find minimum cost spanning tree using Greedy approach and analyze it's time complexity	10
Q2 (b)	Find shortest path using Dijkstra's algorithm for the given graph.(Source node =A) 	10

Q3 (a)	Write an algorithm for 0/1 knapsack using Dynamic Programming approach. Solve the knapsack problem using Dynamic Programming approach and find the maximum profit that can be obtained. A Knapsack Capacity is 5. The weights and values of four objects are as follows: Weight={ 3, 2, 4, 1 } and its corresponding Value= {100, 20, 66, 40}	10
Q3 (b)	Find all pair shortest path for the given graph using Dynamic Approach.  **OR** Explain how Dynamic Approach can be used to construct Optimal Binary Search Tree. Solve one example of it.	10
Q4 (a)	Write an algorithm of sum of subset problem. Solve following sum of subsets problem using backtracking approach w={1,3,4,5} and m=8. Find all possible subsets of 'w' that sum to 'm' with the help of state space tree.	10
Q4 (b)	Explain 0/1 knapsack with Branch and Bound Approach with the help of an example **OR** Compare Backtracking and Branch and Bound Approach. Explain how 8 Queen Problem can be solved using backtracking approach.	10
Q5 (a)	Explain Longest Common Subsequence algorithm. Find LCS of the following two strings: X="ABCDBCA" and Y="ABBCCDB"	10
Q5 (b)	Write short note on **any two**: a. String Matching with Finite Automata b. Matrix Chain Multiplication c. Optimal Storage on tape d. Traveling Salesperson problem using Dynamic Programming Appraoch	10

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15/05/18 (E)

K. J. Somaiya College of Engineering, Mumbai-77
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End Semester Exam
May -June 2018

Max. Marks: 100 | **Duration:** 3 Hrs.
Class: S.Y. BTECH | **Semester:** IV
Name of the Course: Microprocessor | **Branch:** Computer
Course Code: UCEC402

Instructions:
(1) All Questions are Compulsory.
(2) Draw neat diagrams wherever required.
(3) Assume suitable data if necessary.

Question No.		Max. Marks
Q 1 (a)	What is the significance of the following pins of 8086: 1) RQ/GT_0, 2) READY, 2) NMI, 4) HLDA, 5) QS_1/QS_0	5
Q 1 (b)	Differentiate between NEAR and FAR procedures.	5
Q. 1 (c)	Explain control register of Intel 80386 processor with a diagram.	5
Q. 1 (d)	Explain control word formats of PPI 8255.	5
Q 2 (a)	PPI 8255 is to be interfaced with Intel 8086. Answer questions (1) and (2) given below for the specified configuration. 1) Write the control words to initialize IC 8255 in the following configurations: a) All the ports of A, B, and C are output ports (mode 0). b) PA =Input, PB =Output, PCL = Output, and PCH = Output. 2) Assuming that IC 8255 is interfaced at address 4000H, a) Find the I/O port addresses assigned to ports A, B, C, and the control register. b) Program the 8255 for ports A, B, and C to be output ports. c) Write a program to send 55H and AAH to all ports continuously. **OR** 3) Design an interface of PPI 8255 with Intel 8086 for the following requirements: i) There is 1, 16-bit I/P and 1, 16-bit O/P port. ii) Starting address is 2000H. Clearly show the design, address decoder and I/O map.	10 10

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19-5-18(E)

K. J. Somaiya College of Engineering, Mumbai-77
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End Semester Examinations
April - May 2018

Max. Marks:100 **Duration: 3hrs**
Class: S.Y. B.Tech Semester: IV
Name of the Course: Relational Database Management Systems
Branch: Comp
Course Code:UCEC404

Instructions:
(1) All Questions are Compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Question No.		Marks
Q 1 (a)	Define the following terms with the help of example. (i) Generalization and Aggregation (ii)Total Participation and Partial Participation	10
Q1 (b)	Describe the overall architecture of DBMS with suitable diagram.	10
Q2 (a)	Explain Log based recovery and shadow paging in detail.	10
	OR	
Q2 (a)	Explain conflict serializability and view serializability with examples.	10
Q2(b)	Explain following Relational Algebra Operations with example. (i)Project (iii) Natural Join (ii)Union (iv) Cartesian product	10
Q3 (a)	What is Normalization? Explain 1NF,2NF, 3NF and BCNF normal form with Examples.	10
	OR	
Q3(a)	What is Decomposition? Explain lossless join decomposition and dependency preserving decomposition.	10
Q3 (b)	Explain following types of SET operations in SQL with example. i)UNION ii) UNION ALL iii)INTERSECT iv)MINUS	10
	OR	
Q3(b)	Explain the term super key, primary key, candidate key and foreign key giving suitable examples	10

Q4 (a)	For the following given database, write SQL queries:- STUDENT(S_ID,S_NAME,S_ADDRESS,S_PHONE,S_AGE) COURCE(C_ID,C_NAME) STUDENT_COURCE(S_ID,C_ID) 1. Find out S_NAME of STUDENTs who have either enrolled in C_NAME 'DSA' or 'DBMS. 2. Find out S_NAME of STUDENTs who are enrolled in C_ID 'C1' 3. Find out all Student details whose Name starts with 'A'. Assume values to required attribute.	10
Q4 (b) Q4(b)	Explain Domain constraints and referential integrity constraints. OR Explain DCL and View command in SQL with example.	10 10
Q5(a)	What is deadlock? How it is detected? Discuss different types of deadlock prevention scheme.	10
Q5(b)	Draw an ER Diagram and convert it into relational model for a Company, which has several Employees working on different types of Projects. Several Employees working for one Department, every Department has Manager .Several Employees are supervised by one Employee.	10