CST 38

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5030

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – DEC.2022 / JAN. 2023
Third Semester
Computer Science and Engineering
U19CS307 – OBJECT ORIENTED PROGRAMMING
(Common to Computer Science and Technology)
(Regulation 2019)

Time: Three Hours   Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Differentiate between Object Oriented Programming and Procedure Oriented Programming.	2	K2	CO1
2.	Is Java a pure object-oriented language?	2	K4	CO1
3.	Why JAVA does not support multiple inheritance?	2	K2	CO2
4.	How do you call a superclass version of an overriding method in a subclass?	2	K1	CO2
5.	Can we override a method that throws runtime exception without throws clause?	2	K3	CO3
6.	What are the differences between error and exception?	2	K2	CO3
7.	Can two threads execute two methods (static and non-static) concurrently?	2	K3	CO4
8.	Which is most preferred – synchronized method or synchronized block?	2	K4	CO4
9.	How is delegation based event handling better than traditional, procedural event handling?	2	K2	CO5
10.	How are canvas objects used?	2	K3	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	What is Compile time Polymorphism and how is it different from Runtime Polymorphism? Explain.	13	K4	CO1

(OR)

b)	What is data abstraction and how to achieve it? Differentiate between data abstraction and encapsulation.	13	K4	CO1
12. a)	What are the characteristics of constructors in Super and child classes in Java? Explain.	13	K1	CO2

(OR)

b)	Describe the differences between method overloading and overriding? What is method hiding in Java?	13	K4	CO2
13. a)	Why do you need Java exception handling? Explain the mechanism for handling exceptions in Java?	13	K1	CO3

(OR)

b)	How do you catch multiple exceptions in a single block of code? What will be the result of the main method throwing an exception? Explain with an example.	13	K3	CO3
14. a)	What is the difference between notify and notify All in Java? Why wait, notify, and notify All are not inside the thread class?	13	K2	CO4

(OR)

b)	How can we create daemon threads? Can we make the user thread as daemon thread if the thread is started? Justify.	13	K3	CO4
15. a)	Why does a client programmer need to use "implements" when using the 'ActionListener' class? What are the "Impositions" on a client programmer that come with implements?	13	K1	CO5

(OR)

b)	Describe the three main concepts in event driven programming. Discuss how event handling can be achieved using these three concepts?	13	K1	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Suppose that you are writing an applet, and you want the applet to respond in some way when the user clicks the mouse on the applet. Formulate the four things you need to put into the source code of your applet.	15	K6	CO5

(OR)

b)	i.	Is it compulsory for a Try Block to be followed by a Catch Block in Java for Exception handling? Justify your answer.	8	K5	CO3
	ii.	Is there any way to skip Finally block of exception even if some exception occurs in the exception block? Justify your answer.	7		

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Reg.No.: | | | | | | | | | | | |

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Question Paper Code: 13007

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – DEC.2022 / JAN.2023

Third Semester

Computer Science and Technology

U19CT302 – DATABASE MANAGEMENT SYSTEMS

(Regulation 2019)

Time: Three Hours   Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Differentiate between primary key and foreign key.	2	K2	CO1
2.	What is a weak entity? Give an example.	2	K2	CO1
3.	List two reasons why null values might be introduced into the database.	2	K2	CO5
4.	State the steps in query processing.	2	K2	CO4
5.	List out the aggregation functions used in SQL.	2	K3	CO3
6.	What are the problems caused by redundancy?	2	K2	CO3
7.	What is serializability? How it is tested?	2	K2	CO2
8.	What are the types of locks used in concurrency control?	2	K2	CO2
9.	Differentiate between static and dynamic hashing.	2	K3	CO4
10.	Distinguish between threats and risks.	2	K3	CO4

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Explain the various types of database users.	5	K2	CO1
		ii.	Explain in detail about the architecture of DBMS.	8	K2	CO1
			(OR)			
	b)		Construct an E-R diagram for a car insurance company whose customers won one (or) more cars each. Each car has associated with zero to any number of recorded accidents. State any assumptions you make.	13	K2	CO1
12.	a)		Consider the following relational schema: Employee(empno, name, office, age) Books (isbn, title, authors, publisher) Loan(empno, isbn, date) Write the following queries in relational algebra.			
		i.	Find the names of employees who have borrowed a book published by XYZ ltd.	4		
		ii.	Find the names of employees who have borrowed all books published by XYZ ltd.	3	K2	CO1
		iii.	Find the names of employees who have borrowed more than five different books published by XYZ ltd.	3		
		iv.	For each publisher, find the names of employees who have borrowed more than five books of that publisher.	3		
			(OR)			
	b)		Write and demonstrate the DDL, DML commands in relational algebra for the student's database, which contains the following student details: name, id, DOB, branch, DOJ and course details: course name, course id, stud id, faculty name, id, marks.	13	K2	CO2
13.	a)		Give an example of a relation that is in 3NF but not in BCNF. How will you convert that relation into BCNF?	13	K3	CO3
			(OR)			
	b)		Using Employee database, explain referential integrity using SQL queries.	13	K3	CO3
14.	a)	i.	During execution, a transaction passes through several states, until it finally commits (or) aborts. List all possible sequences of states through which a transaction may pass. Explain why each state transition may occur?	8	K2	CO2
		ii.	Explain with an example the properties that must be satisfied by a transaction.	5	K2	CO2
			(OR)			

b)	State and explain the lock based concurrency control with suitable example.		13	K2	CO2
15. a)	Construct a B+ tree with the following data: key values – (2,3,5,7,11,17,19,23,29,31). Illustrate the step wise insertion in the B+ tree.		13	K3	CO5

(OR)

b)	Explain in detail about RAID system. Also explain in detail about how does it improve performance and reliability? Explain in detail about level 3 and level 4 of RAID.		13	K3	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Suppose that we have the following three tuples in a legal instance of relation schema S with three attributes ABC (listed in order) (1,2,3), (4,2,3), and (5,3,3).			
	i. Which of the following dependencies can you infer does not hold over schema S? A→B, BC→A, B→C	7	K2	CO3
	ii. Can you identify any dependencies that hold over S?	8		

(OR)

b)	Prove the statement "when the column of a view is directly derived from a column of a base table, that column inherits any constraints that apply to the column of the base table" by using suitable example.		15	K2	CO3

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Question Paper Code: 13006

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – DEC.2022 / JAN.2023

Third Semester

Computer Science and Technology

U19CT301 – DATA STRUCTURES AND ALGORITHMS

(Regulation 2019)

Time: Three Hours   Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define ADT. Give an example ADT.	2	K1	CO1
2.	Mention the applications of linked lists.	2	K1	CO1
3.	What are priority queues? Define priority queue ADT.	2	K1	CO2
4.	Construct Binary Min-Heap for the keys: 23,4,-6,3,2,-4,1.	2	K3	CO2
5.	How many nodes are there at the maximum in a binary tree of height 'h'.	2	K4	CO3
6.	List all binary search trees of size 3 (the number of nodes is 3).	2	K4	CO4
7.	Mention three applications of Depth First Search (DFS) algorithm.	2	K2	CO4
8.	Consider a graph of 5 nodes and 7 edges. Represent it in adjacency list and adjacency matrix.	2	K2	CO5
9.	What is the best and worst case time complexity of i. Insertion sort ii. Heap sort.	2	K3	CO3
10.	Solve $T(n)=T(n/2)+1$, $T(1)=1$, assume n is a power of 2.	2	K3	CO5

PART – B

Q.No.		Questions	Marks	KL	CO
11.	a)	Write a pseudo code to insert a node at the beginning of a singly linked list, to delete a node given its pointer, to delete the last node of the singly linked list. Trace your code with a suitable example.	13	K4	CO1
		(OR)			
	b)	Discuss doubly linked list in detail with supporting operations.	13	K4	CO1
12.	a)	Discuss Stack, Queue with supporting operations in detail. Also, discuss about the applications of Stack and Queue.	13	K2	CO2
		(OR)			
	b)	Discuss the creation of binary max-heap, its applications and time complexity analysis. Use examples wherever appropriate.	13	K4	CO3
13.	a)	What is the time complexity of insert, delete, search operations in AVL trees. Write the pseudo code for insert and search.	13	K4	CO4
		(OR)			
	b)	Discuss inorder, preorder, postorder traversals in detail. Given a preorder and in-order, how do you construct the associated binary tree.	13	K3	CO4
14.	a)	Discuss Dijkstra's shortest path algorithm with an example. Also analyze its time complexity.	13	K3	CO5
		(OR)			
	b)	Discuss Kruskal's Minimum spanning tree algorithm with an example. Also analyze its time complexity.	13	K3	CO5
15.	a)	Present Linear search, Binary search algorithms with its time complexity analysis.	13	K4	CO3
		(OR)			
	b)	Discuss various Hashing techniques with suitable examples.	13	K2	CO3

PART – C

Q.No.		Questions	Marks	KL	CO
16.	a)	Discuss Quick sort, Merge sort, Selection sort in detail (Algorithm, Trace, Time complexity in best and worst case).	15	K4	CO3
		(OR)			
	b)	Discuss Splay operations in splay tree construction and AVL rotations in AVL tree construction.	15	K2	CO4