



B.E DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Third Semester

INFORMATION SCIENCE AND ENGINEERING

U18ISI3201: Data Structures

COURSE OUTCOMES

CO1: Develop applications using stack and queue data structures.

CO2: Develop applications to retrieve records from database using hashing technique.

CO3: Compare efficiency of various searching techniques using different tree data structures.

CO4: Compare efficiency of various sorting techniques using different data structures.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

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|--|-----------------------|
| 1. List any two non linear data structures. | CO1 [K ₂] |
| 2. Specify the asymptotic notations used in time complexity. | CO1 [K ₁] |
| 3. List the applications of stack. | CO2 [K ₁] |
| 4. Compare stack and Queue. | CO2 [K ₃] |
| 5. Prepare the advantages of linked list over array. | CO3 [K ₂] |
| 6. How is circular linked list is better than doubly linked list? | CO3 [K ₁] |
| 7. Distinguish Binary tree and Binary search tree. | CO4 [K ₂] |
| 8. List the properties of B Tree. | CO4 [K ₁] |
| 9. Identify the collision resolution strategies used in hashing technique. | CO5 [K ₂] |
| 10. What is worst case time complexity of shell sort? | CO5 [K ₁] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

11. a) Derive time complexity for the following routine. 10 CO1 [K₂]
- ```
int Sum(int A[], int N)
{
 int s=0;
 for (int i=0; i< N; i++)
 s = s + A[i];
 return s;
}
```
- b) Demonstrate any two data structure operations in detail. 6 CO1 [K<sub>2</sub>]
12. Develop the routine for insertion and deletion operations in queue ADT. 16 CO2 [K<sub>3</sub>]
13. Describe any 3 operations on singly linked list with appropriate routine and example. 16 CO3 [K<sub>2</sub>]
14. Explain different rotations in AVL tree with example. 16 CO4 [K<sub>2</sub>]
15. a) Apply insertion sort algorithm for the given data 34 8 64 51 32 21. 8 CO5 [K<sub>2</sub>]
- b) Explain separate chaining with example. 8 CO5 [K<sub>2</sub>]
16. Describe different methods used to present graph. 16 CO4 [K<sub>2</sub>]

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