Institute of Technical Education & Research, SOA Deemed To Be University

MID SEMESTER EXAMINATION, May-2022
Computer Science Workshop 2 (CSE3141)

Programme: B.Tech(CSE/CSIT)
Full Marks: 30

Semester: 4th
Time: 2 Hours

Subject/Course Learning Outcome	*Taxonomy Level	Ques. Nos.	Marks
Analysis algorithm, using time and space complexity.	L3,L4	Q1c, Q5a, b,c	2+2+2+2
Understanding and effectively use ADT, java collection, sorting and searching.	L1,L3	Q1,Q2,Q3, Q4,Q5	22
Applying linked list, stack, queue on different problem solving.	L1,L3,L4		
Applying priority queue, graph on problem solving.	L1,L3,L4		
Understanding algorithm design techniques.	L1,L3,L4		
Applying design techniques on problem solving.	L1,L3,L4		

*Bloom's taxonomy levels: Knowledge (L1), Comprehension (L2), Application (L3), Analysis (L4), Evaluation (L5), Creation (L6)

Answer all questions. Each question carries equal mark.

1. (a) Write a program to create a class **ArrOp**, add a method to the class which takes an array as the argument and find a contiguous sub array whose sum is maximum.   2

(b) Add a method to **ArrOp** which take two integer as argument and find greatest common divisor(GCD) of that numbers using recursion. 2

(c) Use the created method in 1.b to find the GCD of N number. Create another class **ArrOpApp** and invoke all the method created above. Find the time complexity of the created methods. 2

Note: write as a single program for Q1.a, Q1.b, Q1.c .

2. (a) Create a static function to find all permutation of an integer list. 2

(b) Write a program to create a static function which takes an array as argument and find maximum distance of index j and i, such that i^{th} position element is greater than j^{th} element. 2

(c) Given array of size N, containing element from 0 to N-1. All values from 0 to N-1 are present in array and if they are not there than -1 is there to take place. Write a static function which takes this array as an argument and arrange values of array so that value i is stored at arr[i]. 2

Note: All bits of question 2. are static function no main function and class is required for it.

3. (a) Write a program to create a class **Employee**, having private member variable empId, name, salary. Add the required setter method, getter method and overwrite toString method to print the value of the member. 2

(b) Create another class **CollOp** add a method to it which create an ArrayList of Employee object , display the created ArrayList , also search an particular object is present in the array list or not. 2

(c) Add a method to **CollOp** to create a TreeMap which map department name to **Employee** object. Display the created TreeMap. Create a class **CallOpApp** and invoke the method created for execution. 2

Note: write as a single program for Q3.a, Q3.b, Q3.c.

4. (a) Write a static function which takes two char/string as argument and return that is it operator or not.   2

  (b) Create a static function which takes a post-fix expression as argument and evaluate the expression using stack.   2

  (c) Create the required class and function to execute the above static function.   2

Note: write as a single program for Q4.a, Q4.b, Q4.c.

5. (a) Create a static function which takes two sorted array and merge these to make another sorted array in O(N) time.   2

  (b) Pivot means arranging the elements of an array in such a way that all element smaller than pivot element are present to left of pivot and greater elements are present right to pivot. Create a static function which takes an array as argument and make the last element of the array as pivot element, find the time complexity of created function..   2

  (c) Write a static function to print all duplicate element of an array, also find its time complexity.   2

End of Questions