III-SEM./ IT/CSE/ 2021(W)

TH-II Data Structure

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

a. What is the need of time-space trade off of an algorithm?
b. State at least two applications of stack?
c. Differentiate between array and string?
d. What will be the output of following code
```
char str[]="Knowledge World"
printf("%d", strlen(str));
printf("%d", sizeof(str));
```
e. Define ADT.
f. Explain sparse matrix.
g. What do you mean by polish notation? How it differs from two other notations?
h. Differentiate between path matrix and adjacency matrix in a graph?
i. Relate in between strict binary tree and complete binary tree.
j. What will be the output of the following code
```
int arr[5]={10,20,30,70,90};
printf("%d",a[5]);
```

2. Answer any five 5X6

a. Illustrate overflow and underflow status of Queue with example.
b. Write a C program for linear search.
c. Explain the procedure to insert a node at the end of a single linked list.
d. Write the algorithm for binary search.
e. How circular linked list differs from single linked list? Explain.
f. Discuss at least five string library functions with examples.
g Analyse the memory representation of one-dimensional array with example.

3 Write a C program to input and print a 3x2 dimensional matrix. 10

4 Explain different file organization and access methods? 10

5 Illustrate the push and pop operation of stack in evaluating an arithmetic expression. 10

6 Define binary tree. Discuss the traversing of a binary tree with example? 10

7 Write short notes on (any four) 10

a) Priority Queue c) Recursion e) Hashing
b) BST d) Garbage Collection