Total No. of Questions – [08] Total No. of Printed Pages 02

G.R. No.	

paper code: U228-143 (RE-FS)

MAY 2019/ENDSEM REEXAM

S.Y.B.TECH.(INFORMATION TECHNOLOGY) (SEMESTER- II)

COURSE NAME: DATA STRUCTURES AND FILES

COURSE CODE: ITUA22173

(PATTERN 2017)

Time: [**2 Hours**] [Max. Marks: **50**]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8**
2) **Figures to the right indicate full marks.**
3) **Write suitable examples wherever necessary.**
4) **Draw suitable diagrams if required.**

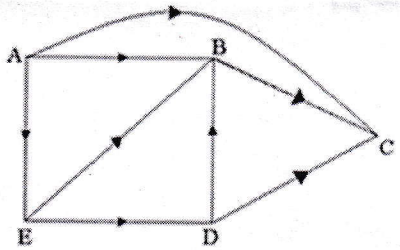
Q.1) a) 1) Construct a binary tree from given traversals: (Show steps) [6]
Inorder:- H,D,I,B,E,A,J,F,K,C,G
Postorder:- H,I,D,E,B,J,K,F,G,C,A

2) Construct a threaded binary tree from given traversals: (Show steps)
preorder:- * + a – b c / - d e - + f g h
inorder:- a + b – c * d – e / f + g – h

OR

b) Describe binary search tree. Write its advantages over general binary tree. [6]
Create BST for 55,22,12,25,67,45,77,89,8,99,65

Q.2) a) Write non-recursive algorithm for BFS of a graph. Perform BFS on the following graph. [6]



OR

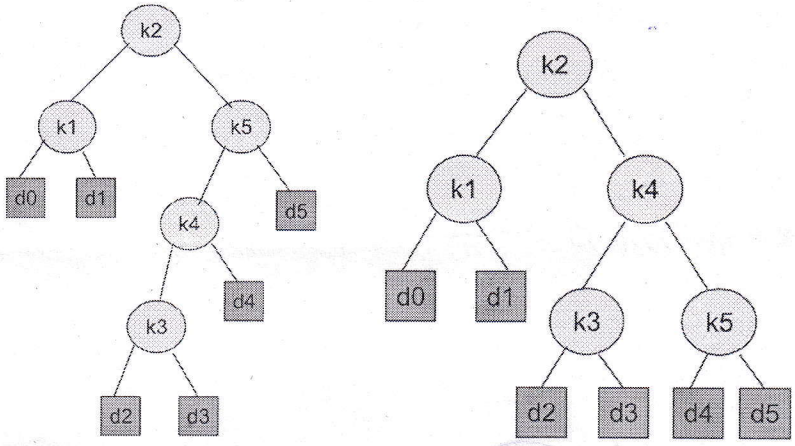
b) Write a pseudo code for Dijkstra's algorithm. Give example. [6]

Q.3) a) Assume a hash table of size 8 and hash function h(x)= x mod 8. Perform linear probing with chaining with replacement for the following values. Comment on the load factor of this hash table. [6]
2,8,14,66,22, 47, 56,9,55

OR

b) Identify the optimal BST from the given BSTs. Justify your answer. [6]

i	0	1	2	3	4	5
pi		0.15	0.10	0.05	0.10	0.20
qi	0.05	0.10	0.05	0.05	0.05	0.10



Q.4) a) Write pseudocode for heap sort and the supporting functions. [4]

OR

b) Build min-heap for the given numbers. [4]
55, 33, 11, 77, 44, 22, 66, 88, 57

Q.5) a) Insert following keys in a B tree of order 5: [6]
40,35,70,22,89,99,12,1,32,23,55,78,82,29,41,8,14

b) Write and explain various applications of trees, advanced trees and multi-way trees. [4]

c) Explain splay trees in detail and compare it with AVL tree. [4]

OR

Q.6) a) Construct AVL tree for the following data: MAR, MAY, NOV, AUG, APR, JAN, DEC, JUN, FEB, JUL, OCT, SEP. Show the balance factor of each node and the type of rotation. [6]

b) Explain R-B tree in detail. [4]

c) Compare B-tree and B+ tree with suitable example. [4]

Q.7) a) Explain direct access file with advantages, disadvantages and example. [6]

b) Write a pseudo code for searching a record in index sequential file. [4]

c) Distinguish between logical and physical deletion of records. Write an example of each. [4]

OR

Q.8) a) Explain different types of external storage devices. [6]

b) Write and explain the algorithm for insertion in direct access file. [4]

c) Explain different C++ functions used for navigation in file. Write syntax [4]