GIET MAIN CAMPUS AUTONOMOUS,
GUNUPUR - 765022

Registration No: | | | | | | | | | | |

Total Number of Pages :2

B.TECH. DEGREE EXAMINATION-Nov-Dec.2018
End Semester Examination-III Semester
BITPC3010-ADVANCED DATA STRUCTURES
(Regulations 2017)(Information Technology Branch)

Time : 3 Hours Maximum : 100 Marks Question Code:261712

Answer ALL Questions

PART-A (10 X 2=20 Marks)

1. a) A data structure in which elements can be inserted or deleted at/from both the ends but not in the middle is? [CO2][PO1]
   a)Queue b) Circular queue c) Dequeue d) Priority queue
   b) How many stacks are needed to implement a queue. Consider the situation where no other data structure like arrays, linked list is available to you. [CO2][PO1]
   a) 1 b) 2 c) 3 d) 4
   c) Which of the following is an application of Red-black trees? [CO2][PO1]
   a)used to store strings efficiently b) used to store integers efficiently
   c)can be used in process schedulers, maps, sets d) None of the above
   d) A man wants to go different places in the world. He has listed them down all. But there are some places where he wants to visit before some other places. What application of graph can he use to determine that? [CO2][PO1]
   a)Depth First Search b) Breadth First Search c) Topological Sorting
   d) Dijkstra's Shortest path algorithm
   e) Procedure of sorting algorithms for larger records that does not fit in main memory and are stored on disk is classified as [CO3][PO1]
   a) parser sorting b) external sorting c) internal sorting d) secondary sorting
   f) Which algorithmic technique does Fibonacci search use? [CO4][PO1]
   a)Brute force b) Divide and Conquer c) Greedy Technique d) Backtracking
   g) What is a hash table? [CO4][PO1]
   a)A structure that maps values to keys b) A structure that maps keys to values
   c) A structure used for storage d) A structure used to implement stack and queue
   h) What is a skip list?
      a. a linked list with size value in nodes [CO2][PO1]
      b. a linked list that allows faster search within an ordered sequence
      c. a linked list that allows slower search within an ordered sequence
      d. a tree which is in the form of linked list
   i) What is buddy memory management of free lists?
      a) modified version of first fit [CO2][PO1]
      b) buddy allocation keeps several free lists, each one holds blocks which are of one particular size
      c) modified version of best fit
      d) a tree representation of free lists
   j) How does implicit free lists (garbage collection) works in adding memory to free list?
      a) whichever comes last will be added to free list [CO2][PO1]
      b) whichever comes first will be added to free list
      c) certain blocks cannot be used if there are no pointers to them and hence they can be freed
      d) makes a probabilistic guess

PART-B (10 X 2=20 Marks)

2. a) Define Big O notation. [CO1][PO1]
   b) What is a stack? Explain their applications. [CO2][PO1]
   c) What do you mean by amortized analysis? [CO2][PO1]
   d) Mention different representation of a graph. [CO2][PO1]
   e) Explain single ended priority queue operations. [CO2][PO1]

f) Analyze sequential search vs binary search [CO4][PO1]
g) What is the maximum number of nodes in a binary tree with height n, where root is height 0. [CO4][PO1]
h) What is the lower Bound on Complexity for Sorting Methods. [CO3][PO1]
i) What is rehashing? [CO4][PO1]
j) Explain first-fit memory allocation method? [CO4][PO1]

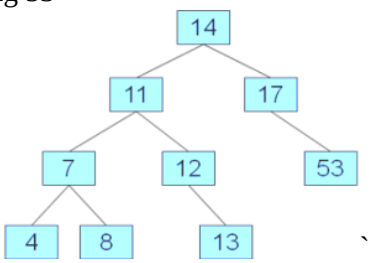
PART-C (4 X 15=60 Marks)

3a. i. Analyze the Ω-notation for the function given as : f(n)= 5n3+n2+3n+2 [8][CO1][PO2]
ii. Design an algorithm to convert infix expression into postfix expression. [7][CO1][PO3]

(or)

b. i. Design an algorithm for creating a heap. [7][CO2][PO3]
ii. Define Max Heap. Write an algorithm to delete a node into Max heap. [8][CO2][PO1]

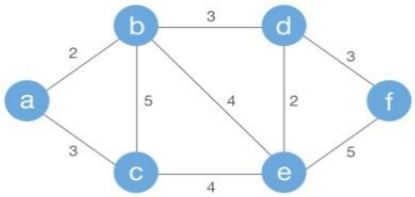
4a. i. Construct the AVL tree after deleting 53 [8][CO2][PO1]



ii. Construct a 2-3 B tree for the list C, O, M, P, U, T, I, N, G. [7][CO2][PO1]

(or)

b. i. Design an algorithm to perform insertion operation in binary search tree. [7][CO2][PO3]
ii. Describe prim's algorithm for minimum cost spanning tree for the following graph. [8][CO2][PO1]



5a. i. Explain Radix sorting with an example? [7][CO3][PO1]
ii. Design a recursive procedure to search an element in a BST. [8][CO4][PO2]

(or)

b. i. The file F containing 600 records is to be sorted. The main memory is capable of sorting of 1000 records at a time. The input file F is stored on one disk and we have in addition another scratch disk. The block length of the input file is 500 records. Explain the disk sorting method. [10][CO3][PO1]
ii. Illustrate analysis of Fibonacci searching. [5][CO3][PO1]

6a. i. What is skip lists? Explain the insertion and deletion operation in a skip list. [5][CO2][PO1]
ii. Following elements are inserted into an empty hash table with hash function f(x) = x% 13 and linear probing 112, 44, 52, 45, 37, 278, 89, 28, 61,249 a) Draw the hash table for each insertion. b) What is the load factor after last insertion? c) What is the maximum number of buckets examined in an unsuccessful search. [10][CO4][PO1]

(or)

b. i. Explain different memory allocation and garbage collection methods in data structure. [8][CO4][PO2]
ii. What is a dictionary? Describe its features. [7][CO2][PO1]

==0==