Code: 15A05201 **R15**

B.Tech II Year II Semester (R15) Supplementary Examinations December 2018

DATA STRUCTURES

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Define asymptotic notations.
(b) Differentiate between arrays and linked list.
(c) What is linear data structure? Discuss difference between FIFO and LIFO concepts.
(d) Minimum how many numbers of queues are needed to implement the priority queue?
(e) Find the maximum height of any AVL tree with 9 nodes.
(f) What is threaded binary tree? List its advantages.
(g) What is the difference between internal sort and external sort?
(h) List the advantages and disadvantages of merge sort.
(i) Define hashing.
(j) What do you mean by double hashing?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Explain the pseudo code to insert a new node in the beginning and end of the singly linked list.
(b) Consider a 2-D array A: [-200:200, -10:100]. Find the address of the element A [199, 50] by considering the base address 10 and assume each element takes 4 bytes for storage. Follow row major order.

OR

3 Write an algorithm to perform the following operation on a singly linked list:
(i) Insert node at the beginning of list.
(ii) Insert new node at middle.
(iii) Delete a node in the middle and last.
(iv) Count the number of nodes.

UNIT – II

4 (a) Write an algorithm to implement insert operation into a circular queue using linked list representation of a queue.
(b) Draw the hash table with size 11, resulting from hashing the keys: 12, 44, 13, 88, 23, 94, 11, 39, 20, 16 and 5 using the hash function $h(\mathrm{i}) = (2\mathrm{i} + 5)$ mod 11.

OR

5 (a) Write an algorithm to implement PUSH and POP operations on stack.
(b) Convert the following infix expression into post-fix notation:
$\mathrm{A} + (\mathrm{B} * \mathrm{C} - (\mathrm{D}/\mathrm{E}/\mathrm{F}) * \mathrm{G}) * \mathrm{H}$

Contd. in page 2

UNIT – III

6 (a) What is the difference between heap and binary search tree? Construct the heap and binary search tree for the following data set: 55, 64, 82, 23, 10, 62, 98, 33, 66, 18, 76 and 55.

(b) Explain Dijkstra's algorithm for finding the shortest path in a given graph.

OR

7 Construct an AVL tree with the following numbers: 25, 46, 13, 55, 15, 30, 58, 4. And insert 50, 10 and 40, delete 25, 13 and 30 and rebalance the tree if necessary in each case.

UNIT – IV

8 Write an algorithm for bubble sort and explain it with an example.

OR

9 Write an algorithm for quick sort and trace the algorithm with the following data set: 77, 12, 8, 39, 27, 21, 44, 18, 6, 427, 117 and 600.

UNIT – V

10 (a) Discuss sequential search procedure with example.

(b) What is collision resolution? Discuss various open addressing methods to collision resolution with example and make a comparison among them.

OR

11 Given input (371, 323, 173, 199, 344, 679, 989) and has function h(x) = x mod 10, show the result using: (i) Separate chaining. (ii) Closed hashing using linear probing, quadratic probing, and double hashing $h_2(x) = 7 – (x \bmod 7)$.

*****

Code: 15A05201 **R15**

B.Tech I Year II Semester (R15) Supplementary Examinations December 2018

DATA STRUCTURES

(Common to CSE and IT)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Define big oh (O) notation and give example.
(b) What is a pointer array? Give example.
(c) Define Push and Pop operations of stack.
(d) Distinguish between open and closed hashing.
(e) Define B tree and state its properties.
(f) Define connected and disjoint graphs.
(g) Define sort efficiency. Give the efficiency of straight insertion sort and quick sort.
(h) What is external sorting? What are the phases of external sorting?
(i) What is sentinel search?
(j) What is bucket hashing?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Write an algorithm to sort an array of integers in ascending order using array.

OR

3 Implement the following single linked list operations:

(a) Insertion of a node.
(b) Deletion of a node.
(c) Searching an element

UNIT – II

4 How do you evaluate postfix expression? Give example and write a function to evaluate postfix expression.

OR

5 Give the linked list representation of a priority queue. Write the algorithms to implement insertion and deletion operations on a priority queue.

UNIT – III

6 Explain various types of binary tree traversals with example and functions.

OR

7 Explain depth first search operation of a graph with example and write the algorithm.

UNIT – IV

8 An array contains the elements shown below:

3 13 7 26 44 23 98 57

Sort the array using bubble sort and shown the contents of the array at each step.

OR

9 Write a function to implement heap sort algorithm.

UNIT – V

10 Explain the concept of sequential search with example and write the pseudocode of the algorithm.

OR

11 Explain the concepts of the following:

(a) Midsquare method of hashing.
(b) Linear probe Collision Resolution.
(c) Linked list collision resolution.

*****

Code: 15A05201

R15

B.Tech II Year I Semester (R15) Regular & Supplementary Examinations November/December 2018

DATA STRUCTURES

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Define array with syntax.
(b) What is meant by asymptotic notation?
(c) Define queue. Write some of the applications.
(d) What is the need of Hash table?
(e) Define red black tree.
(f) Differentiate full binary tree with complete binary tree.
(g) Define sorting.
(h) What are the principles of sorting by selection?
(i) What is meant by collision resolution?
(j) How sequential search algorithm is analyzed?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Write a C program for adding two matrices.

OR

3 Explain the concept of circular linked list and circular doubly linked list with an example.

UNIT – II

4 Describe about the various representation of stack. Also write the procedure for evaluating an expression using stacks.

OR

5 Explain the working principles of priority queues with an example.

UNIT – III

6 Discuss about height balanced trees and their operations with an example.

OR

7 Explain the concepts of topological sorting with suitable examples.

UNIT – IV

8 Illustrate with an example about binary insertion sort.

OR

9 Give a procedure for heap sort and analyze its complexity.

UNIT – V

10 Explain in detail about binary search with an example.

OR

11 Briefly explain about the concepts of Hashing methods.

*****

Code: 15A05201 **R15**

B.Tech II Year II Semester (R15) Supplementary Examinations December 2017

DATA STRUCTURES

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Write an algorithm to visit all the elements present in an array.
(b) Present the formulas to store the elements of tri-diagonal matrix in row and column major order.
(c) Write the procedure to evaluate a post fix expression.
(d) Define hashing. Why we need it?
(e) Distinguish between trees and binary trees.
(f) With the help of suitable example, explain full binary trees.
(g) Why we need sorting? Explain.
(h) Write the best, average and worst case time complexities for bobble sort and quick sort.
(i) Give brief description about the technique behind the linear search
(j) Assume that the key value = 1522756. Find its address by using pure folding and fold boundary methods.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Give brief description about the role of asymptotic notations in design of algorithms.
(b) What is a sparse matrix? How to store it in memory? Explain.

OR

3 (a) Explain how to represent the polynomials. Give example.
(b) What is an array? Discuss in detail about one dimensional arrays.

UNIT – II

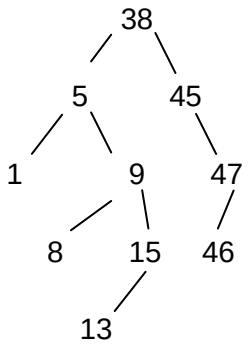
4 (a) Write the procedure to convert an infix expression into a postfix form. Convert the following infix expression into postfix by using the stack: $(\mathrm{A} + \mathrm{B}) \times (C - D) / (G + H)$.
(b) In how many ways a stack can be stored in memory. Explain any one technique with suitable example.

OR

5 (a) What are the drawbacks of queues? Discuss in detail about the circular queues.
(b) What is a dequeue? What are the various operations that can be performed on them? Explain.

UNIT – III

6 Define a binary tree. Write the procedures for various tree traversal techniques. Find the order of visiting for the following tree by using the different tree traversal techniques.



OR

7 (a) Discuss with example, the different representations of a graph.
(b) With the help of suitable example, explain warshall technique to find the shortest path for any given graph.

Contd. in page 2

UNIT – IV

8 (a) With the help of an example, explain sorting of elements by using insertion sort?

(b) Sort the following elements by using bubble sort {J, N, T, U, E, X, A, M}.

OR

9 (a) Define a max heap. Write the procedure to create the max heap. Explain with example.

(b) Discuss in detail about the merging of ordered files.

UNIT – V

10 (a) Search for the element 13 from the given set by using binary search technique. {5, 10, 13, 15, 25, 28, 29, 33, 44, 55}.

(b) Write and explain any one four hashing techniques with suitable examples.

OR

11 What is collision? List various collision resolution techniques. Explain any two collision resolution techniques.

*****

Code: 15A05201 **R15**

B.Tech II Year I Semester (R15) Regular & Supplementary Examinations November/December 2017

DATA STRUCTURES

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Give the necessity of asymptotic notations and what are the various notations?
(b) List various applications of liked list.
(c) Convert the following infix form to prefix and postfix.
((A + B) * C – (D – E)) $ (F + G)
(d) Design Hash Division Algorithm.
(e) Define complete binary tree with an example.
(f) Enumerate the steps to delete an edge from an undirected graph.
(g) Differentiate insertion sort with selection sort.
(h) Give the time complexity for shell sort and heap sort.
(i) Design an algorithm for linear search and give its time complexity.
(j) What are the different collision resolution strategies?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Design an algorithm for traversing an array.
(b) Define sparse matrix. Show how memory is represented for upper triangular matrix.

OR

3 Discuss various operations on Circular Double Linked List with an example.

UNIT – II

4 Briefly define all the operations of stack by writing algorithms using linked list.

OR

5 Write a C program to implement various operations of queue using linked list.

UNIT – III

6 Prove the following properties of the Binary tree:

(a) The maximum number of nodes possible in a binary tree of height h is 2^h-1.
(b) The height of a complete binary tree with n number of nodes is $\lceil \log_2 (n+1) \rceil$.
(c) For any non-empty binary tree, if n is the number of nodes and e is the number of edges then n = e+1.

OR

7 (a) Define topological sorting.
(b) Enumerate steps in Topological Sorting Algorithm.
(c) Write a C program for topological sorting

UNIT – IV

8 Prove that the average case of Quick Sort algorithm is O (log n).

OR

9 (a) Explain merge sort with an example.
(b) Design an algorithm for merge sort.

UNIT – V

10 Design recursive algorithm for Binary Search and give its time complexity.

OR

11 (a) Define hash function.
(b) Discuss about various methods of hash functions with examples.
(c) Define bucket hashing.

*****

Code: 15A05201 **R15**

B.Tech I Year II Semester (R15) Supplementary Examinations November 2017

DATA STRUCTURES

(Common to CSE and IT)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Consider the function f(n)= $\sum_{i=1}^{n} i$. Express f(n) in terms of Big-O notation.

(b) Differentiate singly linked list and doubly linked list.

(c) State the applications of stack.

(d) Define priority queue with diagram and give the operations.

(e) Define Threaded Binary tree.

(f) Define Topological sort. What is the running time for topological sort?

(g) Write worst case and best case time complexity of the bubble sort algorithm.

(h) State the algorithmic technique used in merge sort. Define it.

(i) What are the two broad classes of collision resolution techniques?

(j) Write the time complexity of linear search and binary search techniques.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Briefly discuss about various asymptotic notations with an example.

(b) Write an algorithm for determining transpose of a matrix using multi dimensional array.

OR

3 Explain the following operations in a doubly linked list:

(a) Create an empty list.

(b) Insert the elements 10 and 20 at the front of the list.

(c) Insert the elements 30 at the middle of the list.

(d) Insert the elements 15, 45 at the end of the list.

(e) Delete the middle element from the list.

UNIT – II

4 (a) Construct an empty stack and perform PUSH operation for any five elements. Also perform POP operation for two elements and show the value on the top of stack.

(b) What do you mean by stack overflow and stack underflow?

OR

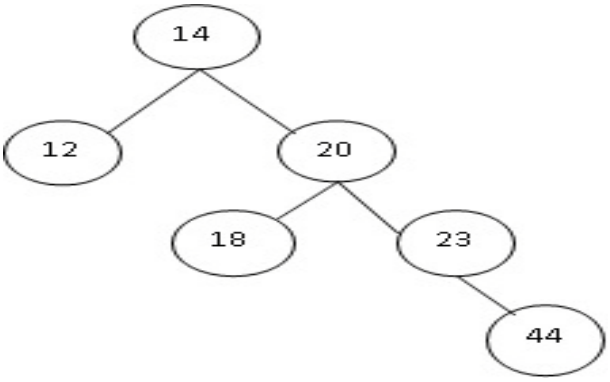
5 Write an algorithm to implement insert and delete operations in Queue with array implementation for the following elements 88, 25, 67, 15, 56 with diagrammatic representations.

Contd. in page 2

UNIT – III

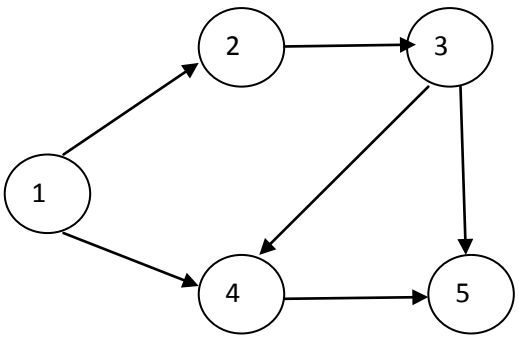
6 (a) Construct Binary Search Tree by inserting the following key elements:
10, 12, 5, 4, 20, 8, 7, 6, 15.

(b) Construct height balanced tree for the following after rotation.



OR

7 Draw the adjacency list representation for the following graph. Also perform topological sorting for the following graph.



UNIT – IV

8 Sort the following numbers using selection sort and insertion sort: 45, 25, 10, 2, 9, 85, 102, 1

OR

9 Write an algorithm to sort a set of 'N' numbers using Quick Sort. Trace the algorithm for the following set of numbers: 54, 26, 93, 17, 77, 31, 44, 55 and 20.

UNIT – V

10 (a) Compare binary search and linear search techniques.

(b) Find the number 77 from the following set of numbers using binary search:
6, 12, 17, 23, 38, 45, 77, 84, 90.

OR

11 Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function h(x) = x(mod 10), show the resulting: (i) Open hash table using linear probing. (ii) Open hash table using quadratic probing. (iii) Open hash table using double hashing with second hash function h2(x) =7-(x mod 7).

*****

Code: 15A05201

R15

B.Tech II Year II Semester (R15) Regular Examinations May/June 2017

DATA STRUCTURES

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Write an algorithm to delete an element from an array.
(b) Draw the node structure of a double linked list. Explain the various fields present in it.
(c) Define hashing. Give example.
(d) List the types of dequeue.
(e) In what way a binary search tree differs from a tree? Give example.
(f) Define balancing factor. Give example.
(g) Write the worst, average and best case time complexities for shell and quick sorts.
(h) Distinguish between min and max heaps.
(i) How can we say that linear search is least efficient search technique? Explain.
(j) Assume that the given key is 1234. By using mid-square method, find the address required to store it by using 3 digit address.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) What is a sparse matrix? What are its drawbacks? Explain lower triangular sparse matrix with suitable example.
(b) What are different positions that a node can be inserted into a single linked list? Explain them in detail.

OR

3 (a) List the advantages of double linked list over single linked list. What are the possible positions that a node can be deleted from a double linked list? Explain.
(b) Why we need to use arrays? Write the procedure to insert an element into an array.

UNIT – II

4 (a) What is a stack? List the applications of stacks. Explain any two applications with suitable example.
(b) In how many ways a queue can be stored in memory? Explain them.

OR

5 (a) List and explain the applications of queues.
(b) How can we insert and delete an element from a circular queue? Explain.

UNIT – III

6 Define binary search tree. Create a binary search tree from {7, 4, 12, 2, 6, 9, 19, 8, 15, 11, 3, 20, 5}. How can we delete an element from the binary search tree? After creation of the tree delete elements 6, 12 and 3. Explain the procedure in detail.

OR

7 How can we make an unbalanced tree as a balanced one? Explain various rotations that are involved in it. Give examples for each rotation.

UNIT – IV

8 (a) Sort the following set of elements by using insertion sort {S, T, R, U, C, T, U, R, E, S}.
(b) Distinguish between list and binary insertion sort.

OR

9 (a) With the help of algorithm and example, explain the sorting of elements by using quick sort.
(b) Give brief description about the process of merging the unordered files.

UNIT – V

10 (a) Distinguish between binary and linear searching techniques.
(b) With the help of suitable example, explain the linked list collision resolution technique.

OR

11 (a) What is meant by hashing? Why we need it? Explain hashing techniques.
(b) Write short notes on bucket hashing.

*****

Code: 15A05201 **R15**

B.Tech I Year II Semester (R15) Regular & Supplementary Examinations May/June 2017

DATA STRUCTURES

(Common to CSE and IT)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) What is best case and worst case performance?

(b) Let P be a singly linked list and Q be the pointer to an intermediate node x in the list. What is the worst-case time complexity of the best known algorithm to delete the node x from the list?

(c) Assume that the operators +, -, x are left associative and ^ is right associative. The order of precedence (from highest to lowest) is ^, x, +, -. What is the postfix expression corresponding to the infix expression a + b x c - d ^ e ^ f?

(d) What are the prerequisites for implementing the queue using array?

(e) Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?

(f) Define transitive closure of a graph.

(g) Consider a file sorted in the reverse order. Calculate the total number of comparisons when the file is sorted using insertion sort.

(h) Suppose we have a O(n) time algorithm that find median of an unsorted array. Now consider a Quick Sort implementation where we first find median using the above algorithm, then use median as pivot. What will be the worst case time complexity of this modified Quick Sort?

(i) Write non recursive pseudo code for binary search.

(j) What are the ways in which rehashing can be implemented?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Describe different notations used to represent complexities.

OR

3 Write an algorithm to delete a node having minimum value from a single linked list.

UNIT – II

4 Write an algorithm to convert infix expression into polish notation.

OR

5 Write the procedure to insert and delete a data in queue. Illustrate with an example.

UNIT – III

6 Construct a binary tree given the pre-order and in-order sequences as below:
Pre order : a b c e I f j d g h k l
In order : e i c f j b g d k h l a

OR

7 Write and explain Dijkstra's algorithm for finding shortest path. Give an example.

UNIT – IV

8 Trace the quick sort algorithm to sort the list J, N, T, U, A in alphabetical order.

OR

9 Explain heap sort algorithm. Illustrate with an example.

UNIT – V

10 Illustrate the idea of searching a hash table using chaining techniques.

OR

11 Compare bucket hashing with open hashing and closed hashing. Write algorithm to search key value, insert key value and delete a key value in bucket hashing.

*****

Code: 15A05201 **R15**

B.Tech I Year II Semester (R15) Supplementary Examinations December 2016

DATA STRUCTURES

(Common to CSE and IT)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) List out the areas in which data structures applied extensively.

(b) Differentiate array and linked list.

(c) Consider the following stack of characters, where stack is allocated N = 8 memory cells.

STACK : A, C, D, F, K, _, _, _.

Describe the stack as the following operations takes place.

(i) POP (STACK, ITEM)

(ii) POP (STACK, ITEM)

(iii) PUSH (STACK, R)

(iv) PUSH (STACK, L)

(d) How do you test for an empty queue?

(e) There are 8, 15, 13, 14 nodes, were there in 4 different trees. Which of them could have formed a full binary tree?

(f) Write the applications of graph data structure.

(g) Why is quick sort better than other sorting algorithms?

(h) List the properties of heap sort.

(i) What is sentinel search?

(j) What is clustering in a hashing and list its types?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Explain in brief about multi-dimensional array with an example.

OR

3 Write the various operations of double linked list in detail.

UNIT – II

4 Explain the various stack operations and illustrate the procedure *Infix To Postfix* with the following arithmetic expression: (A + B) ^ C – (D * E) / F).

OR

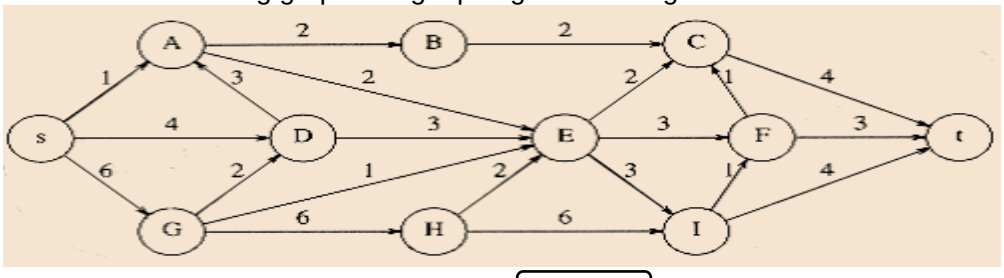
5 Write an algorithm and explain the various operations of Circular queue.

UNIT – III

6 Write a routine to perform a tree traversal with one example.

OR

7 Simulate the following graph using topological ordering.



UNIT – IV

8 Explain in brief about Two Way merge sort with an example.

OR

9 Explain quick sort with an example.

UNIT – V

10 Briefly explain about probability search and Ordered list search.

OR

11 Explain linear probing and quadratic probing with an example.

*****

Code: 15A05201

R15

B.Tech II Year I Semester (R15) Regular Examinations November/December 2016

DATA STRUCTURES

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Which are the different asymptotic notations?
(b) Define singly linked list.
(c) What are the different operations on stack?
(d) What are the various different queue structures?
(e) What do you mean by binary search tree?
(f) Define graph and how does it is represented in computer memory.
(g) What is average case, best case and worst case complexity of bubble sort algorithm?
(h) How do we do choice of Pivot in Quick Sort?
(i) What is hash function? Also give features of good hash function.
(j) What are different collision resolution strategies?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 What is an array? Also explain concept of multidimensional array & write a pseudo code for inserting into and deleting data from array.

OR

3 Compare sequential and linked organization? Which are the different primitive operations associated with linked list? Write a pseudo code to insert into Singly linked list.

UNIT – II

4 Describe all the stack operations as well as applications.

OR

5 Describe all the queue operations as well as applications.

UNIT – III

6 What is binary tree? What are the different binary tree traversal techniques?

OR

7 Describe shortest path algorithm with example.

UNIT – IV

8 What are the different types of sorting? Explain File sort in detail.

OR

9 What is sort stability and sort efficiency? Explain bubble sort with example.

UNIT – V

10 Which are the different methods of implementing hash function? Explain any two in detail.

OR

11 Describe open addressing and Chaining.

*****

Code: 15A05201 **R15**

B.Tech I Year II Semester (R15) Regular Examinations May/June 2016

DATA STRUCTURES

(Common to CSE and IT)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) What is meant by garbage collection?
(b) What is meant by asymptotic notation?
(c) Explain how address of an element in array is calculated.
(d) What is meant by abstract data type?
(e) What is the difference between full binary tree and complete binary tree?
(f) What is an articulation point in a graph?
(g) What is the difference between internal sorting and external sorting?
(h) Define a B-tree.
(i) What are self-referential structures?
(j) What is meant by collision in hashing?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 List out at least ten differences between array and linked list w.r.t. storage, accessing, size etc.

OR

3 Write a procedure to add two polynomials using linked lists.

UNIT – II

4 Write a procedure to evaluate an expression using stacks.

OR

5 Explain working of priority queues with an example.

UNIT – III

6 Explain insertion and deletion of a new element in height balanced tree.

OR

7 Write a procedure for topological sorting in a graph.

UNIT – IV

8 Give a procedure for heap sort and analyze its complexity.

OR

9 Explain merge sorting with examples and analyze its complexity.

UNIT – V

10 Explain linked list collision resolution.

OR

11 Explain Fibonacci search using an example.

*****

Code: 15A05201

SS

B.Tech II Year I Semester (R15) Regular & Supplementary Examinations November/December 2017

DATA STRUCTURES

(Computer Science & Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Define big 'O' notation and big Omega notation.
(b) List the advantages of linked lists over arrays.
(c) State the basic operations that can be performed on a stack.
(d) How the enqueue and dequeue operations are performed in queue?
(e) Compare binary tree and binary search tree.
(f) Discuss representation of graph with an example in brief.
(g) What is the advantage of quick sort and its time complexity?
(h) What is the main idea behind selection sort?
(i) Distinguish between linear search and binary search.
(j) What is collision? List the different types of collision resolving techniques.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Describe the role of space and time complexities in measuring the performance of a program with an example.

OR

3 Explain how to create circular linked list and insert nodes at end.

UNIT – II

4 Write a program to perform basic operations on stack.

OR

5 Write an algorithm to insert and delete a key in a circular queue.

UNIT – III

6 Discuss about all cases in deleting an element from a BST. Give suitable example for each case.

OR

7 What is graph? Explain how a graph is represented as a hash table.

UNIT – IV

8 What is meant by sorting? Write an algorithm for bubble sort and illustrate with an example.

OR

9 Sort the following numbers using merge sort: 45, 34, 12, 46, 27, 56, 11, 87, 6, 33, 28.

UNIT – V

10 Differentiate between DFS and BFS with an example.

OR

11 Write short notes on the following:

(a) Open addressing.
(b) Bucket hashing.

*****

Code: 15A05201 **SS**

B.Tech II Year I Semester (R15) Regular Examinations November/December 2016

DATA STRUCTURES

(Computer Science & Engineering)

Time: 3 hours Max. Marks: 70

PART - A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) What are the applications of list?

(b) What are the different types of circular linked list?

(c) What are the conditions that followed in the array implementation of queue?

(d) Define stack ADT with an example.

(e) What are the various transformations performed in AVL tree?

(f) Define lazy deletion.

(g) Explain the performance analysis of the algorithm.

(h) Write the function in c for shell sort.

(i) What is replacement selection?

(j) What is rehashing?

PART - B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT - I

2 (a) Given two sorted lists L_1 and L_2 , write a procedure to compute $L_1 - L_2$ using only the basic operations.

(b) Write a routine to insert an element in a linked list.

OR

3 Design and implement an algorithm to search a linear ordered linked list for a given alphabetic key or name.

UNIT - II

4 (a) What is a stack? Write down the procedure for implementing various stack operations.

(b) Explain the various applications of stack.

OR

5 Explain the implementation of stack using linked list.

UNIT - III

6 (a) Explain the Prim's algorithm to find minimum spanning tree for a graph.

(b) What are strongly connected components? Explain.

OR

7 Formulate an algorithm to find the shortest path using Dijkstra's algorithm.

UNIT - IV

8 Explain the algorithm for bubble sort and give a suitable example. Explain the algorithm for exchange sort with a suitable example.

OR

9 Explain a sorting technique which follows divide and conquer mechanism with an example.

UNIT - V

10 Write a C program that search for a value in a stored array using non recursive binary search.

OR

11 What is collision resolution technique? What are the types of collision resolution strategies in open addressing?

*****

Code: 15A03201

SS

B.Tech II Year I Semester (R15) Regular & Supplementary Examinations November/December 2018

DATA STRUCTURES

(Computer Science & Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Arrays are kept in row major order. How is the statement relevant to a programmer?

(b) What are the applications of linked list?

(c) Write the prefix equivalent of the expression (3+5)* 7/(8*9+(10*11)%12).

(d) Find out how many no. of elements will present in a circular queue [0-11] when front = 10 and rear = 3.

(e) What is the average no.of comparisons in BST?

(f) Define transitive closure of a graph.

(g) What is the run time complexity of selection sort and insertion sort?

(h) List the drawbacks of merge sort.

(i) Write non recursive pseudo code for BSF.

(j) Define hashing.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 A two dimensional array is stored row by row then what is the address of matrix element A[I, J] for n row and m column matrix. How array representation of polynomial $6x^2 + 7xy + y^2$ can be done.

OR

3 What is the need of DLL? Consider a problem of inserting a node into DLL to the left of a specified node whose address is given by variable M. Give details of algorithm.

UNIT – II

4 State the steps to implement PUSH and POP operations of a stack.

OR

5 Write an algorithm to implement queue using linked list.

UNIT – III

6 What is BST? Create a BST for the following data 20,45,30,16,5,7,8,26,23,14. Explain deleting node 23 in the resultant BST.

OR

7 Write an algorithm of DFS.

UNIT – IV

8 Apply quick sort on the following data 42,23,74,11,65,58,94,36,99,87.

OR

9 Explain Heap sort with an algorithm.

UNIT – V

10 Discuss any one of the rehashing method with an example.

OR

11 Illustrate an algorithm for binary search which tells how many comparisons it did to search an element given as user input.

*****