

PURBANCHAL UNIVERSITY

2015

B.E. (Computer)/Third Semester/*Chance*

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG273CO: Data Structure & Algorithm (Old Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer EIGHT questions.

1. Define Stack. Write the algorithm for stack operation. What are the different functions used for the operation of stack as a linked list? 2+3+5
2. Define queue with example. Explain the differences between linear queue and circular queue with example. 3+7
3. Discuss the differences between singly linked list and doubly linked list. Write an algorithm to insert and delete a node in the beginning of a singly linked list. 3+7
4. What is Recursion? Write a program for TOH. Explain its structure for disk=4. 2+4+4
5. What is tree? Explain different tree traversal algorithm with example. 10
6. Explain Quick sort and Merge sort with an example. 5+5
7. What is binary search? Explain binary search with appropriate example. 2+8
8. Explain Dijkstra's algorithm with suitable example. 10
9. Write short notes on any TWO: 5+5
 - (a) Hashing
 - (b) Huffman tree
 - (c) Priority queue

PURBANCHAL UNIVERSITY

2016

(Computer)/Third Semester/Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

3273CO: Data Structure & Algorithm (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question are specified along its side.

Answer EIGHT questions.

What is data structure? Explain abstract data type and Big 'O' notation with its definition and importance.

Explain stack with its operation and implementation. Discuss applications of stack with example.

Explain linear queue and circular queue and explain how it can be removed.

Discuss doubly linked list and singly linked list. Also write an algorithm to insert a node in the middle of the doubly linked list with illustrations.

Explain the need and importance of Recursion. Discuss 'TOH' in terms of recursion.

Discuss Huffman tree with proper example and also write its application.

What is meaning of efficiency of sorting? Explain Heap Sort with example.

What is Binary search? Explain with proper illustrations.

Discuss shortest path algorithm with an example.

Write short note any TWO.

- (a) Graph Traversal
- (b) Big omega notation
- (c) Hashing

Q.7. Sort the numbers: [25, 5, 46, 35, 10, 50, 84, 31, 66] using exchange sort and heap sort. [4+4]

Q.8. a) Explain the searching procedure in Binary Search with an example. [4]

b) Explain in details about Hashing. [4]

Q.9. Define weighted graph. Use Prim's Algorithm to convert a graph into minimum spanning tree taking a suitable example. [2+6]

Q.10. Sort notes: [4×2=8]
a. Tree Traversal
b. AVL Tree.
c. Shortest Path Algorithm
d. Graph Traversal

The End

PURBANCHAL UNIVERSITY

2018

B.E. (Computer)/Third Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG273CO: Data Structure & Algorithm (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

- 1(a) ✓ Define data structure and Algorithm. What are the features of an algorithm? Write an example of an algorithm. 6
- (b) Explain the Asymptotic Analysis of an Algorithm. ✓ 4
- 2(a) (a) Differentiate between linear data structure and non-linear data structure. 4
- (b) Define STACK. Write an algorithm for PUSH, POP and display the content in a STACK. 6
3. ✗ Write an algorithm for evaluating the postfix expression. Convert the following infix expression into its equivalent postfix expression.
 $((a+b)*(x+y)/(f-c*e)+d)$ 10
- 4 ✓ Differentiate between linear Queue and Circular Queue. Write an algorithm and program to enqueue, dequeue and display the content of linear Queue. 10
- 5 ✓ Define Linked list. Write an algorithm and function to insert a node at the end, delete a node of a specific position and display the content of doubly linked list. 10
6. (a) Differentiate between iteration and recursion. Write an algorithm and program for Tower of Hanoi Problem (TOH) using recursion. 10
- 7(a) (a) Differentiate between binary tree and binary search tree. Make the binary tree from following data: 6
Post-order: I D B G C H F E A
In-order: B I D A C G E H F

Contd. ...

(2)

- (b) Define and explain Height balance tree with an example. 4
- 8(a) What are the importance of sorting in data structure?
Differentiate between internal sort and external sort with an example. 5
- (b) Sort the numbers: 4, 9, 2, 5, 3, 10, 8, 33, 6 using heap sort. 5
9. What is importance of searching in data structure? Explain the various type of searching. Write an algorithm and program for binary searching. 10
10. Write short notes on any TWO: 5+5
- (a) Dijkstra's Algorithm
 - (b) Priority queue
 - (c) Hashing

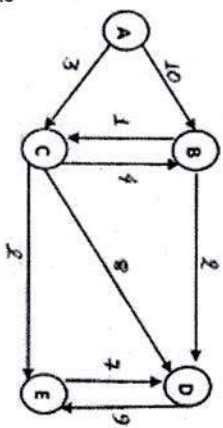
Instructions:

Dear Students!

- This model of examination is for you as the end of your current semester. This examination allows you to write answer from your own place of residence. Follow the following instructions without fail.
- Do not write your name in the answer-sheet(s).
- All the answer-sheets should be sent to college through your approved email in which you have received your question paper.
- Do not write questions in the answer-sheet but mention clearly the question number.
- All the scan/photos of answer-sheets should be clearly visible. Any blur scan/photo will not be considered for evaluation. Responsibility lies with the students to make sure that scan/photos of the answer-sheet are of readable quality.
- Leave 1 inch margin on each side of the answer-sheet.
- Clearly mention your Roll no, subject, program, semester, page number at the right-top of each page as instructed by the Office of the Examination Management.
- Make sure that you send your answer-sheets within the given time. Any email received after the given time will not be acceptable.
- You are strictly advised to write with your own handwriting and that you are not using any unfair means to answer the questions.
- Do not consult during the examination period to any other person in answering the questions.
- Do not post any pictures of taking examination or your answer-sheets in any social-media. Found that may be taken action from University.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side. **Answer EIGHT questions. 8*10=80** 1(a) List out the operations on STACK. Write an algorithm to evaluate postfix expression with an example. 2+3

- (b) How STACK is used for checking validity of an Arithmetic expression? Illustrate with an example. 5 2. Explain the operations in Queue. Write a program to implement the operations of a Queue. 4+6
3. Write an algorithm to insert a node at specified position of a singly linked list and delete the node from the end of a singly linked list. List out the advantages and disadvantages of singly linked list. 7+3
4. What is recursion? Briefly explain the advantage of recursion over iteration. Write a program of TOH implementing recursion. 2+3+5
5. Sort the numbers: [25, 55, 46, 35, 10, 90, 84, 31] using exchange sort and insertion sort. 5+5 6(a) Explain the searching procedure in Binary Search with an example. 5 (b) What is a Hash collision and how it is resolved? 5 7(a) Differentiate between Depth first traversal and Breadth first traversal. 4 (b) Construct an AVL tree for the given input data: 6 35, 39, 55, 86, 5, 11, 45, 76, 95, 42.
- 8(a) Define weighted graph. Use Dijkstra Algorithm to find the minimum path cost from node A to node E for the following graph. 2+6



- (b) What is circular queue? Explain. 2
- (2)
9. Write short notes on any TWO: 2*5=10 (a) Big O () Notation

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PURBANCHAL UNIVERSITY

2021

B.E. (Computer)/Third Semester/ Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG273CO: Data Structure & Algorithm (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

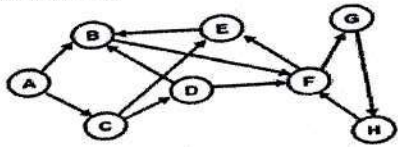
- 1(a) Define an Algorithm. List out its feature. 2+2
(b) Explain the types of Data Structure and list out the various operations performed in data structure. 4+2
- 2(a) What are the applications of STACK. Write an algorithm to evaluate the Postfix expression. 2+3
(b) Convert the infix expression to postfix expression. 3+2
 $(A+(B*C-(D/E^F)*G)*H$
3. Why an asymptotic notation is important? Write the algorithm and program to enqueue, dequeue and display all the elements of a queue. 5+5
4. Write an algorithm to insert a node at the end of a doubly linked list and delete the specified node of a doubly linked list. List out the advantages and disadvantages of doubly linked list. 8+2
5. Why recursion is important and write its type? Write a program to generate the Fibonacci Series using recursion. 5+5
- 6(a) Define Binary tree, Strictly Binary tree, Complete Binary tree and Binary Search tree. 5
(b) Create a tree of following 5
- Preorder: E A C K F H D B G**
Inorder: F A E K C D H G B
7. Sort the numbers: [25, 50, 70, 35, 10, 90, 84, 20] using Insertion sort and heap sort. 5+5

Contd. ...

(2)

8. Explain the searching procedure in Binary Search with an example. 10

9. Define a Graph. Define the terms (Regular Graph, Weakly Connected Graph, and Degree of a vertex). Differentiate between depth first traversal and Breadth first traversal. Use breadth first traversal algorithm for the following graph. 2+2+2+4



10. Define weighted graph. Use Dijkstra Algorithm to convert a graph into minimum spanning tree taking a suitable example. 2+8

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PURBANCHAL UNIVERSITY

2022

B.E. (Computer)/Third Semester/*Final*

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG273CO: Data Structure & Algorithm (*New Course*)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

8×10=80

1. Why data structure are important with proper example. Explain different types of data structure. 4+6
- 2(a) Write an algorithm to perform PUSH and POP operation on Stack. 6
- (b) Why Circular queue is better than Linear queue ? Explain with example. 4
- 3(a) Differentiate between Singly Linked List and Doubly Linked List. 4
- (b) Write an algorithm to insert the node at the beginning and end of the singly linear linked list. 3+3
- 4(a) Write the algorithm to evaluate Postfix Expression. 5
- (b) Explain TOH game and the algorithm to solve the game. 3+2
- 5(a) Create a binary tree with following tree traversal. 4
Inorder: D B F E A G C K J H L
Preorder: A B D E F C G H J K L
- (b) Why AVL tree is better than BST. Explain the balancing algorithm used to balance the tree while creating AVL tree. 2+4
6. Explain heap sort with its types. Sort the following elements by using Radix sort 9 11 54 83 23 644 565. 5+5
- 7(a) Explain Dijkstra's algorithm to find the shortest path of the graph with example. 6
- (b) Differentiate between Depth First and Breadth First traversal in graph. 4

Contd. ...

(2)

- 8(a) What is hash function and hash table? Explain collision resolution technique using chaining with example. 2+4
- (b) Write an algorithm to search the given data by using binary search. 4
9. Write short note on any TWO: 2×5=10
- (a) Big OH notation
 - (b) Tree Traversals
 - (c) Huffman tree and its application

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