PURBANCHAL UNIVERSITY
2018

Bachelor in Information Technology (B.I.T.)/Third Semester/*Final*

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BIT273CO: Data Structure & Algorithm *(New Course)*

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

Figure in the margin indicate full marks.

Group A

Answer TWO questions.   2×12=24

1. What is stack? Give some of the applications and operation of stack with example.

2. Explain different types of graph. Explain different graph traversal method with example.

3. What is binary tree? Explain different binary tree traversal method with example.

Group B

Answer SEVEN questions.   7×8=56

4. What is queue? Write an algorithm to insert a value in a linear queue.

5. What is height balance tree? Construct the AVL tree for the following tree:

    7,2,1,4,5,6,7,16,15,14.

6. Explain different types of list. Write an algorithm to insert a node in the last of a singly linked list.

7. Discuss the algorithm for evaluating a postfix expression.

8. Write a algorithm for finding solution to the Tower's of Hanoi problem. Explain the working of your algorithm (with 3 disks) with diagrams.

9. Explain insertion sort method with example.

10. What is Huffman code? Where is it used? Discuss and also find out the Huffman code of the 7 data items A, B, ----, G with the given weight (frequency).

Value:	A	B	C	D	E	F	G
Weight:	13	2	19	23	29	5	9

11. Write short notes on:
   (a) Shell sort
   (b) Priority Queue

PURBANCHAL UNIVERSITY
2017

Bachelor in Information Technology (B.I.T.)/Third Semester/*Final*

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BIT273CO: Data Structure & Algorithm *(New Course)*

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

Figure in the margin indicate full marks.

Group A

Answer TWO questions.   2×12=24

1. What are the advantages of doubly linked list our singly linked list? Write an algorithm to insert a node in the middle position of doubly linked list.

2. Define spanning tree. Find the minimum spanning tree from the following graph using kruskals algorithm.
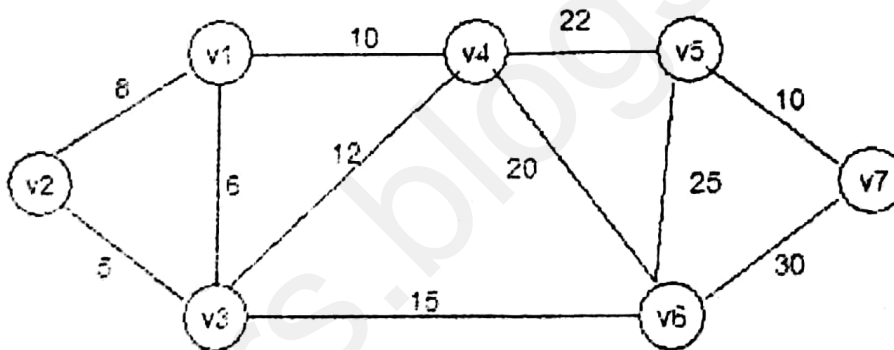
3. What do you mean by Hashing and Hashing function? Explain different collision resolution technique of hash value with example.

Group B

Answer SEVEN questions.   7×8=56

4. What is data structure? What are the advantages of data structure? Write an algorithm to perform Primitives operation of stack.

5. Define ADT. Write an algorithm to evaluate post fix expression with example.

6. What are the advantages of circular queue over linear queue? Show that queue is an ADT.

Contd....

7. Compare recursion with iteration. Create a recursion tree of TOH with example.

8. Explain different graph traversal method with example.

9. Define tree with its application. Explain various tree traversal methods with example.

10. Write an algorithm to sort the data using bubble sort with example.

11. Define graph and explain the various graph representation technique with example.

12. Write short notes on any TWO:
    (a) Heap sort
    (b) Priority Queue
    (c) Efficiency of sorting

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PURBANCHAL UNIVERSITY
2016

Bachelor in Information Technology (B.I.T.)/Third Semester/*Final*

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BIT273CO: Data Structure & Algorithm *(New Course)*

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

Figure in the margin indicate full marks.

Group A

Answer TWO questions.   2×12=24

1. What is stack? Write an algorithm to evaluate a postfix expression with example.

2. What is tree? Explain Huffman algorithm with a suitable example.

3. Explain Disjkastra's algorithm with example.

Group B

Answer SEVEN questions.   7×8=56

4. Discuss different types of graph. Explain Graph Traversal method with example.

5. Explain Radix Sort with example.

6. What is linked list? Differentiate between single linked list and double linked list.

7. What is recursion? Write algorithm to move n disks in tower of Hanoi problem.

8. What is hashing? Discuss different collision resolution technique in brief.

9. Trace insertion sort to sort following data in ascending order:

    50 20 -10 40 30 -20 90 25

10. What is searching? Compare sequential search with binary search.

11. Explain Kruskal's algorithm to find minimum spanning tree.

12. Write short notes on any TWO:

    (a) Big O notation   (b) ADT   (c) Priority Queue

PURBANCHAL UNIVERSITY
2015

Bachelor in Information Technology (B.I.T.)/Third Semester/*Chance*
Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32
BIT273CO: Data Structure & Algorithm *(New Course)*

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

Figure in the margin indicate full marks.

Group A

Answer TWO questions.   2×12=24

1(a) What is a doubly linked list? How does it differ from a singly linked list?   2+2

(b) Write an algorithm to delete the first node of a singly linked list. Write an algorithm for deletion of the first node of the singly linked list.   3+5

2(a) What is merge sort? Explain it with the help of an example.   2+4

(b) Write an algorithm of merge sort.   6

3(a) What is a spanning tree? Explain Kruskal's algorithm with example.

(b) Explain breadth first search of graph traversal with the help of a suitable example.   6

Group B

**Answer SEVEN questions.**   7×8=56

4. What is a stack? Write algorithm for performing PUSH and POP operations in the stack.   2+2+4

5. What is a queue? Describe briefly any two type of queue.   3+5

6. Translate the following infix expression into its equivalent postfix expression: 8

(A – B) * ((C+D)/E)

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7. What is recursion? How does it differ from iteration? Explain recursion giving an example of calculation of factorial   2+2+4

8. What is binary tree? Write an algorithm of inorder traversal of a binary tree. Also show the postorder traversal of the binary tree given below: 2+2+4
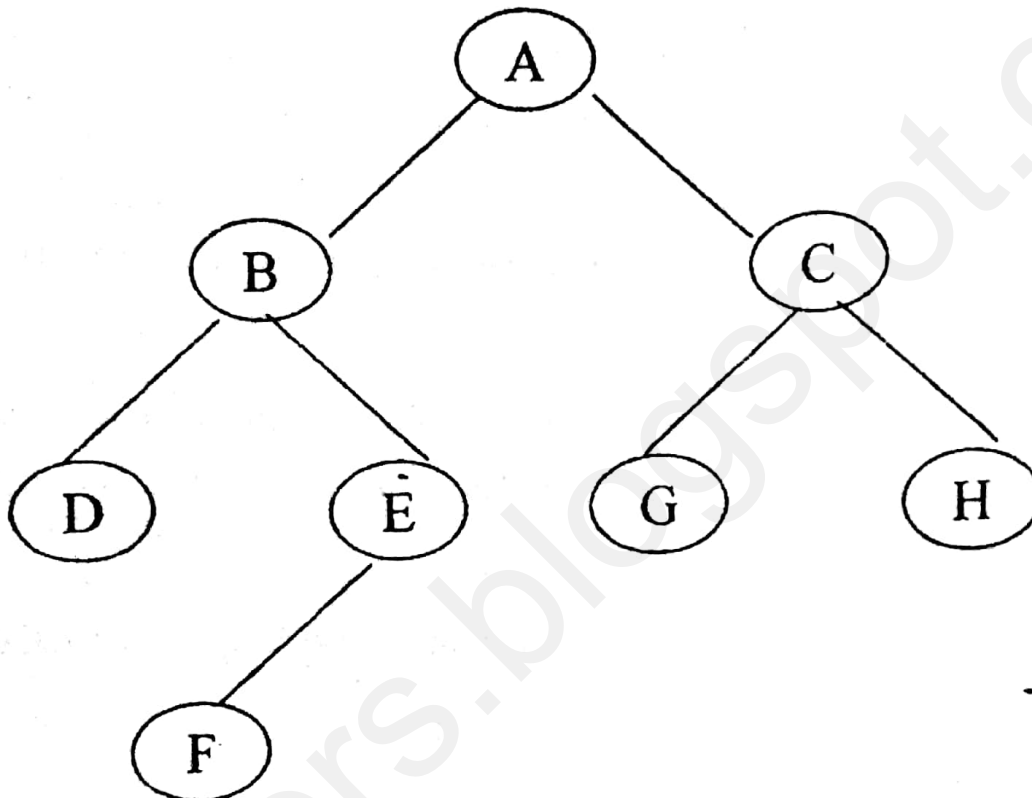
9. What is searching? Explain sequential search with an example.   3+5

10. Define hashing. What is a hash function? Explain with the help of a suitable example.   2+2+4

11. Write short notes on any TWO: 4+4

   (a) Abstract datatype
   (b) Evaluation of postfix expression
   (c) Collision resolution techniques for designing a good hash function
   (d) AVL trees

PURBANCHAL UNIVERSITY
2011

Bachelor in Information Technology (B.I.T.)/Third Semester/Final

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BIT215CS: Data Structure & Algorithm

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

Figure in the margin indicate full marks.

Group A:

Answer TWO questions.   2×12=24

1. Explain balanced binary tree (AVL tree). Discuss the insertion process in a AVL tree. With example.   4+8

2. What is graph? Explain different types of graph. Discuss graph traversal method with example.   2+3+7

3(a) Discuss the advantages of circular Queue over linear Queue with example.   3

(b) Explain different tree traversal method with example.   9

Group B:

Answer SEVEN questions.   7×8=56

4. Discuss stack operation (algorithm) with example.

5. Define Queue. Write an algorithm to insert an element in a linear Queue.

6. Write an algorithm to insert an element in the middle of a doubly linked list.

7. Differentiate between recursion and iteration. Write an algorithm for TOH (Tower of Hanoi).

8. Describe Radix sort with example.

9. What is hashing? What is collision in Hashing? What are the methods to resolve the collision? Explain any one method with example.

10. Write an algorithm of Binary search.

11. What is Big O Notation? What are the different types of Big O Notations?

12. Write short notes on any TWO:
    (a) Priority Queue
    (b) ADT (Abstract data type)
    (c) Divide and Congure Algorithm /Parallel algorithm

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Bachelor in Information Technology (B.I.T.)/Third Semester/Final

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BIT215CS: Data Structure & Algorithm

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

Figure in the margin indicate full marks.

Group A:

Answer TWO questions. $2 \times 12 = 24$

1. Discuss Dijkstra's shortest path problem with example.   12

2. What is minimum weighted path length? Explain Huffman minimum weight path length Algorithm with example.   3+9

3. What is different types of Graphs? Explain graph traversal method with example.   4+8

Group B: $7 \times 8 = 56$

Answer SEVEN questions.   8

4. Explain different operating or stack.

5. Differentiate between linear queue and circular queue. Why circular queue is more useful than linear one?

6. What is doubly linked list? Write an algorithm to insert a node in the middle of the doubly linked list.   2+6

7. Differentiate between recusion and interation. Discuss Fibonacci sequence with example.   4+4

8. Define Binary tree and discuss different Binary tree traversal method with example.   2+6

9. What is sorting? Explain bubble sort with example.

10. Discuss hashing with example and explain one collision resolution technique.   4+4

11. Evaluate the following arithmetic expression written in postfix notation.

P = 7 2 8 + * 10 5 ↓ =

12. Write short notes on any TWO:

    (a) Quick sort

    (b) Sequential search

    (c) Abstract data type

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PURBANCHAL UNIVERSITY
2019

Bachelor of Information Technology (B. I. T.)/Third Semester/*Final*

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BIT280CO: Numerical Methods *(New Course)*

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

The figures in the margin indicate full marks.

Group A

Answer TWO questions.   **2×12=24**

1(a) Define absolute and relative error with example.   2+2

 (b) Solve the following system of linear equations by Gauss Siedal Iteration Method correct up to 3 decimal places.   8

$$5x - 2y + z = 4$$
$$7x - y - 5z = 8$$
$$3x + 7y + 4z = 10$$

2(a) Find the positive root of the equation: $x.e^x = 1$, using Bisection method correct to three decimal places.   7

 (b) Find square root of 5 using Newton-Raphson method.   5

3. Write an algorithm, flowchart and a program to solve a given non-linear equation using Newton Raphson Method in any High Level Language.   12

Group B

Answer SEVEN questions.   **7×8=56**

4. Compute the value of $I = \int_0^2 \dfrac{dx}{1 + x^2}$ by using Simpson's 1/3 rule with 6 stripes.   8

5. Solve $\dfrac{dy}{dx} - x^2 - y^2 = 0$; using Euler's method for y(1.8). The intial condition is y(1)=1 and h=0.2.   8