

SUBJECT : PAPER-304

DATA STRUCTURES

SECOND YEAR B.C.A. (SEM. III) EXAMINATION

This pdf file contains 2013 to 2019 (Regular & ATKT) Years question Papers list of above subject.

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Second Year B. C. A. (Sem. III) (CBCS) Examination

October/November — 2013

Paper - 304 : Data Structures

Time : 3 Hours]

[Total Marks : 70

Instructions:

(1)

Fill up strictly the details of signs on your answer book

Name of the Examination:

☐ **Second Year B.C.A. (Sem. 3)**

Name of the Subject :

☐ **303: Data Structures**

Subject Code No.:

Seat No.:

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Student's Signature

- (2) Write to the point.
- (3) Provide examples and diagrams wherever appropriate / necessary.
- (4) Figures to the right indicates full marks to the question.

Q.1. Answer the following. (Any Seven)

(14)

- (1) Define priority queue.
- (2) What will be the position of front and rear if circular queue is empty?
- (3) What do you mean by left sub tree and right sub tree?
- (4) Let A=78. Address of variable A is 240. Pointer V pointing to variable A. Then what is the difference between *V+1 and *(V+1)?
- (5) Convert infix to postfix:- $Z + (Y * X - (W / V \wedge U) * T) * S$
- (6) What is advantage of link list?
- (7) How to pass pointer to function. Explain with an example.
- (8) List out types of queues.

Q.2.(A) What is Stack? List out operation of Stack? Write down an algorithm of operations on stack.

(7)

OR

(A) What do you mean by non-linear programming? Discuss difference between non-linear programming and linear programming?

(B) What is double ended queue? Explain difference between input restricted and output restricted Dqueue. (7)

Q.3. (A) What is searching? Discuss difference between binary search linear search. Discuss binary search algorithm for following example. (7)

| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Element | 11 | 22 | 30 | 33 | 40 | 44 | 55 | 60 | 66 | 77 | 80 | 88 | 99 |

Search out key = 40. Show all the steps of it

OR

(A) What is sorting? Compare various sorting methods with Its advantages and disadvantages. According to you which is the best sorting technique and why? (7)

(B) Explain the concept of link-list. How to create singly link-list and Display its all nodes? Explain using appropriate example and figure. (7)

Q.4.(A) What is difference between doubly link-list and singly-link list. Write an algorithm to perform insert and deletion from particular position in singly link list. (7)

OR

(A) What is recursion? Write a recursive function that generate first N Fibonacci number. Discuss advantages and disadvantages of it. (7)

(B) Briefly explain pointer. What is difference between static memory allocation and dynamic memory allocation? (6)

Q.5. Answer following (Any Three) (15)

(A) Construct tree of following traversal sequence

Inorder : HOMEISLZR

Preorder- SOHEMILRZ

(B) Write down short note of 2-3 trees.

(C) Difference between Queue and Stack.

(D) Difference between Array of pointer and pointer of array

S.Y.B.C.A. (Sem.III) (CBCS) Examination

November/December- 2014

Data Structures

Time : 3 Hours]

[Total Marks : 70

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Q.1. Answer Following: (Any Seven)

(14)

- (a) What do you mean by forest? Explain with an example.
- (b) What do you mean by NULL in link list? Explain with an example.
- (c) What is the condition of overflow in simple queue? How circular queue is better?
- (d) What is Recursion?
- (e) What do you mean by non-linear data structure? List out the example of it?
- (f) Explain use of 'typedef' with an example.
- (g) Explain array of pointer.
- (h) List out an application of stack.

Q.2.(A) What is Stack? List out operations of Stack? Write down an algorithm

(7)

of infix to postfix.

OR

Q.2.(A) What is tree? What is difference between binary tree and 2-3 tree?

(7)

Discuss various terminologies related to tree.

Q.2.(B) What is linear programming? Discuss difference between FIFO and LIFO programming. Write down algorithm how to delete an element in circular queue. (7)

Q.3.(A) What is searching? Discuss difference between binary search and linear search. (7)
Write down an algorithm for binary search.

OR

Q.3.(A) What is sorting? Write down an algorithm of Merge sort. (7)

Q.3.(B) What is tree? Explain how to insert and delete node in binary tree. (7)

Q.4(A) Describe the concept of Circular singly link list. Write an algorithm to perform insert and deletion from particular position in Circular singly link list (7)

OR

Q. 4(A) What is double ended queue? Explain input restricted and output restricted Dqueue. Write down an algorithm of input restricted Dqueue. (7)

OR

Q.4(B) Explain insertion Sort with an algorithm. (7)

Q.5(A) Construct tree of following expression and write down preorder, inorder and postorder

$((A+B)/D)^A (E - F) * G$ (5)

Q.5(B) Write down short note of Tower of Hanoi. (5)

Q.5(C) Explain simulation. (4)

Second Year B.C.A. (Sem. III) (CBCS) Examination

October / November — 2015

Paper - 304 : Data Structures

Time : 3 Hours]

[Total Marks : 70

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1 Answer Following: (Any Seven)

14

- (a) Define Double ended queue with an example.
- (b) What will be the position of front and rear if queue is full?
- (c) Explain recursion? Mention rules of Tower of Hanoi game.
- (d) List out application of Stack.
- (e) Convert infix to postfix :
 $O + (D * F - (G / V ^ P) * C) * S$
- (f) Explain application of link list.
- (g) Write difference between linear and binary search?
- (h) Explain difference between singly link list and doubly link list?

2 (A) What is Stack? List out operation of Stack? Write down an algorithm of various operations on Stack.

7

OR

(A) What do you mean by Tree? Explain 2-3 tree.

7

- (B) What is double ended queue? Explain input restricted and output restricted Dqueue. Write down an algorithm to insert and delete element in output restricted D-queue. 7
- 3 (A) What is searching? Discuss difference between binary search and linear search. Write down an algorithm of Binary search. 7
- OR**
- (A) What is tree? Explain AVL tree with example. 7
- (B) What is sorting? Discuss insertion sort with an example. 7
- 4 (A) Describe the concept of singly link list. Write an algorithm to perform insert and deletion in singly link list. 7
- OR**
- (A) Write an algorithm to convert infix expression in to postfix. 7
- (B) What is sorting? Explain 2-Way merge sort with an appropriate example. 7
- 5 (A) Construct tree of following expression and write down inorder, preorder and postorder. 5
- $A*(B+C)-A/B +C$
- (B) Write down short note of AVL trees. 5
- (C) Difference between linear and non linear data structure. 2
- (D) Difference between dynamic memory allocation and static memory allocation. 2
- OR**
- (D) Explain Simple, Strickly & Complete binary tree. 2

Second Year B. C. A. (Sem. III) (CBCS) Examination

October / November - 2016

Data Structures

Time : 3 Hours]

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- (2) Write to the point.
- (3) Provide examples and diagrams wherever appropriate / necessary.
- (4) Figures to the right indicates full marks to the question.

1. Answer the following in short : (any seven)

14

- (1) Define data structure. List out types of data structure.
- (2) What is 'TOP pointer in stack ?
- (3) Explain Priority Queue.
- (4) Explain difference between Simple queue and Circular queue.
- (5) What is node ? Explain with example.
- (6) What will be the position of front and rear if circular queue is full ?
- (7) Differentiate between Singly link list and Doubly link list.
- (8) What is root node and leaf node with example.

2. Answer the following in detail : (any two)

14

- (a) What is recursion ? Solve Tower of Hanoi with an example.
- (b) What is stack ? Write an algorithm to perform PUSH and POP operation.
- (c) What is queue ? Write an algorithm to insert and delete an element in circular queue.

3. Answer following in detail : (any two)

14

- (a) Compare Dynamic memory allocation and Static memory allocation. Which is better? Justify your answer with an example.
- (b) What is link list ? Write an algorithm/program to create a node in doubly link list.
- (c) Explain different types of link list with an example. Also write an algorithm/program to delete particular element from singly link list.

4. Answer following in detail : (any two)

14

- (a) What is binary tree ? Write an algorithm to traverse binary tree in In-order, Pre-order and post-order.
- (b) Explain how binary search is better than linear search. Write an algorithm for binary search.
- (c) What is sorting.? Explain which sorting technique is faster. Also write an algorithm/program to sort an element using insertion sort.

5. Answer following in detail : (any two)

14

- (a) Explain 2-way merge sort with an example.
- (b) Explain the sequential and linked storage representation of binary tree
- (c) Define 2-3 trees.

Second Year B. C. A. (Sem. III) (CBCS) Examination

October/November - 2017

Paper - 304 : Data Structures

Time : 3 Hours]

[Total Marks : 70

Instructions:

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Fill up strictly the details of signs on your answer book

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☐ **Second Year B.C.A. (Sem. 3)**

Name of the Subject :

☐ **303: Data Structure**

Subject Code No.:

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- (2) Write to the point.
- (3) Provide examples and diagrams wherever appropriate / necessary.
- (4) Figures to the right indicates full marks to the question.

1 . Answer the following : (Any Seven)

14

- (1) What do you mean by liner and non-liner data structure?
- (2) Explain Circular Queue.
- (3) Define term fink List. List out type of link list.
- (4) What is Graph?
- (5) What is binary tree?
- (6) Define Simulation.
- (7) Polynomial representation of : $x^2 + 3xy + z^2$
- (8) Which condition is not required in dynamic stack?

2. Do as Directed : (Any two)

14

- (a) What is recursion? Write an algorithm to find factorial number.
- (b) What is Queue? List out the types of queues. Write algorithms for insertion and deletion in a circular queue.
- (c) Write a note on storage representation of binary tree.

3. Do as Directed- : (Any two)

14

- (a) Write an algorithm for converting infix expression to prefix expression.
- (b) What is stack? Write an algorithm to perform various operations on stack.
- (c) Explain 2:3 trees.

4. Do as Directed : (Any two)

14

- (a) Write an algorithm to create and delete a node in doubly link list.
- (b) Explain D-Queue? Write an algorithm to insert and delete elements in input-restricted D-queue.
- (c) Explain Quick Sort.

5. Do as Directed (Any two)

14

- (a) What is searching? Differentiate between binary search and linear search.
Write an algorithm for binary search.
- (b) What is sorting? List out the types of Sorting Techniques. Which one is faster?
Write an algorithm for Selection Sort.
- (c) Explain AVL tree in detail.

S.Y. B. C. A. (Sem. III) (CBCS) Examination

October / November - 2018

Data Structures

Time : 3 Hours]

[Total Marks : 70

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☐ Second Year B.C.A. (Sem. 3)

Name of the Subject :

☐ 303: Data Structures

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- (2) Write to the point.
- (3) Provide examples and diagrams wherever appropriate / necessary.
- (4) Figures to the right indicates full marks to the question.

Q.1. Answer Following: (Any Seven)

(14)

- (1) What is TOP pointer in stack?
- (2) Explain difference between Simple queue and Circular queue.
- (3) Differentiate between Singly link list and Doubly link.
- (4) Explain simple, strictly and complete binary tree.
- (5) Convert infix to postfix : $A / (B - C + D) * E + F / G$.
- (6) Explain sibling and forest in tree.
- (7) Give polynomial representation of $8x^2 + 5xy + 3z^2$.
- (8) Find the address of $a[2][1]$ element of a 2 dimension integer row major array, if base address is 1050.
- (9) What will be the position of front and rear if circular queue is full ?
- (10) What is Simulation ?

Q.2. Answer Following: (Any Two) (14)

- (1) Compare Dynamic memory allocation and Static memory allocation. Which is better? Explain Dynamic memory allocation functions with an example.
- (2) What is sorting ? List out sorting techniques. Write an algorithm for Selection sort.
- (3) Write a short note on 2: 3 trees.

Q.3. Answer Following: (Any Two) (14)

- (1) What is queue ? List out types of queue. Write an algorithm for circular queue.
- (2) Explain different storage representation technique of binary tree.
- (3) What is searching ? Differentiate between linear search and binary search. Write an algorithm for binary search.

Q.4. Answer Following: (Any Two) (14)

- (1) Write algorithm/program to insert and delete node from doubly linked list.
- (2) What is D-queue ? Write an algorithm to insert and delete element from input restricted D-queue.
- (3) Write an algorithm for stack operations (PUSH, POP, PEEP and UPDATE).

Q.5. Write short notes for following: (any two) (14)

- (1) Array and its storage representation.
- (2) Tower of Hanoi.
- (3) Quick Sort.

S.Y.B.C.A (Sem.-III) Examination October / November - 2019 Data Structures

Time : 3 Hours]

[Total Marks : 70

Instructions:

Subject Code No: 1911000103040001

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Q.1. Answer Following: (Any Seven)

14

- 1) Differentiate linear and nonlinear data structure.
- 2) What is critical node?
- 3) Write an over flow and underflow condition of input restricted Dqueue.
- 4) What will be the location of front and rear pointers after three consecutive insert and 1 delete operation in simple queue of size 5 with starting location of front and rear at -1 position?
- 5) Write node representation of following polynomial equation.
 $4X^3 - 7X^2 + 8X + 9$
- 6) Define simulation.
- 7) List out applications of stack.
- 8) Write a difference between Simple Queue and Circular Queue.

Q:2(A) What is stack? Write algorithms of various stack operations.

7

OR

(A) Explain AVL tree in detail.

7

(B) Explain storage representation of binary tree.

7

Q:3(A) Discuss advantages of dynamic memory allocation scheme. Which scheme is followed by link list and stack? Write an algorithm to sort a singly link list. **7**

OR

(A) Define Circular Queue. Discuss advantages of Circular Queue over simple queue.

Write algorithms to insert and delete element in circular queue. **7**

(B) Explain 2-Way merge sort in detail with example. **7**

Q:4 Write a short note on following (Any 2) **14**

- 1) Selection sort.
- 2) Output restricted D-queue.
- 3) Storage representation of array.

Q:5 (A) Write an algorithm to evaluate prefix expression. Convert the expression $P * (Q + R / S) ^ T$ into prefix and evaluate this prefix expression using stack tracing with suitable value of P, Q, R, S, T **7**

OR

(A) Write an algorithm to insert node at beginning and end of singly link list. **7**

(B) Explain Tower of Hanoi as application of stack.

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Second Year B. C. A. (Sem. III) (CBCS) Examination

March/April - 2013

Paper - 304 : Data Structures

Time : 3 Hours]

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1. Answer following : (any five)

10

- (a) Find the address of 4th element of an integer array A[10], if base address is 1050.
- (b) What is forest and leaf node ?
- (c) What is array of pointer ? Give appropriate example.
- (d) Which condition is not required in dynamic stack ?
- (e) List out non-primitive data structures.
- (f) Which built-in function is used to create node for link-list ?

2.(a) Explain the concept of stack. Write an algorithm to reverse string using stack.

7

OR

- (a) Explain the difference between stack and queue. Discuss their functional difference. 7
- (b) What is difference between call by value and call by difference? Give appropriate example. 5

OR

- (b) Explain pointer to structure and pointer declared within the structure of type structure. What is difference between them ? 5
- (c) How to create an instance of structure ? What is difference between declaring an instance of structure and declaring it using typedef ? 3

3. (a) Discuss various sorting methods. Which method is faster and why ? 7

OR

(a) Discuss sequential search and binary search methods. 7

Explain binary search providing appropriate algorithm.

(b) Explain concept of circular queue. Describe using appropriate algorithm. 5

OR

(b) Explain concept of insertion sort providing its algorithm. 5

(c) Convert following expressions into postfix : (any one) 3

(i) $A + (B * C - D / E * G) + H$

(ii) $(A + B) * (C - D / E) * G + H$

4. (a) Describe the concept of dynamic memory allocation. 7

How link-list is more appropriate ?

OR

(a) Describe the concept of Doubly link-list. Write an algorithm to perform Delete and Display nodes of Doubly link-list. 7

(b) Discuss the traversal of singly link-list nodes. 5

OR

(b) Explain the process of searching in case of singly link-list. 5

(c) Discuss the insert operation in doubly link-list. 3

5. Answer following : (any three) 15

(a) What is difference between strictly Binary Tree and complete Binary Tree ? Explain the concept of Tree.

(b) What is difference between DFS and BFS ?

(c) Describe the Traversal of binary Tree and its various methods.

(d) How to implement stack using link-list ?

(e) Discuss pointer to array and pointer to structures.

Second Year B. C. A. (Sem. III) (CBCS) Examination

March/April - 2014

Paper - 304 : Data Structures

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(2) Marks are indicated to the right side of the question.

Q.1. Answer following : (any seven)

14

- (a) What do you mean by forest? Explain with an example.
- (b) What do you mean by NULL in link list? Explain with an example.
- (c) What is the condition of overflow in simple queue?
- (d) What is Recursion?
- (e) What do you mean by non-linear data structure? List out non-linear data structures.
- (f) Explain use of 'typedef' with an example.
- (g) What is an array of pointer?
- (h) List out applications of stack.

Q.2(a) What is Stack ? List out operation on Stack ?

7

OR

- (a) What is tree? Explain the concept of binary tree. Discuss various terminologies related to tree.
- (b) What is linear data structure? Discuss difference between FIFO and LIFO concept.

7

Q.3.(a) What is searching ? Discuss difference between binary search and liner search.
Write down an algorithm of binary search. 7

OR

- (a) What is sorting? Explain any two sorting techniques and their complexities.
- (b) What is queue? Explain difference between circular and simple queue. 7

Q.4.(a) Describe the concept of Circular singly link list. Write an algorithm to perform insert and deletion from particular position in Circular singly link list. 7

OR

- (a) What is double ended queue? Explain input restricted and output restricted Dqueue. Write down an algorithm of input restricted Dqueue. 7
- (b) How to implement stack using link-list ? 6

Q.5 Answer following : (any three) 15

- (a) Construct tree of following expression and write down preorder, inorder and postorder :
 $((A+B)/D)^{(E-F)*G}$
- (b) Write short note on Polish notation.
- (c) How to pass pointers to functions ? Explain providing appropriate example.
- (d) How to create node in link-list? Explain difference between creation of singly link-list node and doubly link-list node. Give appropriate example.

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S.Y.B.C.A. (Sem. III) (CBCS) Examination

March/April - 2015

Data Structures

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Q.1. Answer Following: (Any Seven)

14

- (a) Explain the application of link list.
- (b) Explain self referential structure with an example.
- (c) Evaluate postfix expression: 5 , 6 , 2 , + , * , 12 , 4 , / , - .
- (d) Explain sibling and forest in tree.
- (e) Explain Priority queue.
- (f) What do you mean by terminal node? Explain with an example.
- (g) Discuss the real world example of stack.
- (h) Differentiate between $\text{int } *p$ and $\text{int } **p$.

Q. 2. (A) What do you mean by stack? List out the application of stack and write down the algorithm of infix to postfix.

07

OR

(A) Comparison between dynamic stack and static stack. Write down the program of dynamic stack.

07

(B) Comparison between dynamic memory allocation and static memory allocation. Which is

better? "Justify your answer with an example."

07

Q .3. (A) Comparison between simple queue and circular queue. Write down the algorithm of insert and delete an element in circular queue.

07

OR

(A) What do you mean by doubly link list? Write down the algorithm of **(1)** Insert an element in beginning **(2)** Insert an element at middle position.

07

(B) What do you mean by Sorting? Discuss the comparison of sorting technique and according to you which sorting technique is more efficient.
binary tree

07

Q. 4.(A) What do you mean by tree? Discuss various terminologies of trees with an example.

07

(B) Construct the tree and write down the preorder, postorder and inorder of following expression:

07

$[a + (b - c)] * [(d - e) / (f + g - h)]$

OR

(B) Explain sequential representation or linked storage representation of binary tree.

07

Q.5. Answer the following questions:

(A) Discuss tower of Hanoi.

05

(B) What do you mean by searching? Differentiate between binary search and linear search. Write down an algorithm of binary search.

06

(C) Comparison between LIFO and FIFO.

03

Second Year B. C. A. (Sem. III) (CBCS) Examination

March/April - 2016

Paper - 304 : Data Structures

Time : 3 Hours]

[Total Marks : 70

Instructions:

(1)

Fill up strictly the details of signs on your answer book

Name of the Examination:

☐ Second Year B.C.A. (Sem. 3)

Name of the Subject :

☐ 303: Data Structures

Subject Code No:

Seat No.:

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Student's Signature

(2) Marks are indicated to the right side of the question.

Q.1. Answer following : (Any Seven)

14

- Explain Priority queue.
- List out applications of stack.
- Explain simple, strictly and complete binary tree.
- What do you mean by self referential structure.?
- Convert Infix to Postfix: $A / (B - C + D) * E + F ^ G$
- What do you mean by priority queue?
- Explain graph with an example.
- Write down advantages of Quick sort.

Q.2(a) What do you mean by linear Data Structure? Explain Stack with real world example. Also write an algorithm of infix to prefix.

7

OR

- How to insert and delete an element in binary tree? Explain with an appropriate algorithm.

7

- (b) What is queue? Discuss difference between simple and circular queue. Write down algorithm how to insert an element in circular queue. 7

Q.3.(a) What is searching ? Discuss difference between binary search and liner search. Write down an algorithm of binary search. 7

OR

- (a) What is sorting? Explain selection sort. 7
(b) What is tree? Explain Link and threaded storage representation of binary tree. 7

Q.4.(a) Describe the concept of Singly link list. Write an algorithm to perform delete and Display nodes of Singly link list. 7

OR

- (a) Describe the traversal operations of binary tree. 7
(b) Explain Insertion Sort with an algorithm 7

Q.5 Answer following

- (a) Explain Tower of Hanoi. 6

OR

- (a) Explain Simulation. 6
(b) Construct tree: (Show every Steps) 4

Inorder: - + / 8 4 6 * 2 - 9 8

Preorder: 8 / 4 + 6 - 2 * 9 - 8

- (c) Explain 2-3 tree 4

S.Y.B.C.A. (Sem. III) (CBCS) Examination

March / April - 2017

Data Structures

Time : 3 Hours]

[Total Marks : 70

Instructions:

(1)

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| <p>Fill up strictly the details of signs on your answer book</p> <p>Name of the Examination: <input type="checkbox"/> Second Year B.C.A. (Sem. 3)</p> <p>Name of the Subject : <input type="checkbox"/> 303: Data Structures</p> <p>Subject Code No: <input type="text" value="3"/> <input type="text" value="7"/> <input type="text" value="3"/> <input type="text" value="3"/></p> | <p>Seat No.: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <div style="border: 1px solid black; height: 80px; margin-top: 10px;"></div> <p style="text-align: center;">Student's Signature</p> |
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- (2) Write to the point.
- (3) Provide examples and diagrams wherever appropriate I necessary
- (4) Figures to the right indicate full marks to the question.

Q.1. Answer Following: (Any Seven)

14

- (1) Differentiate between linear and nonlinear data structure.
- (2) Justify : Link List is a dynamic list.
- (3) Explain Output Restricted D- queue.
- (4) Give the polynomial representation of $2x^2 + 3xy + y^2 + z$
- (5) What is pointer ? Explain with example.
- (6) Define complete binary tree with example.
- (7) Differentiate between singly link list and doubly link list.
- (8) Define graph with example.

Q.2. Answer following in detail: (any two)

14

- (a) What is recursion ? Explain type of recursion. Write a program to find factorial of given number using recursion.
- (b) Write an algorithm to convert infix expression into prefix expression.
- (c) What is queue ? Write an algorithm to insert and delete an element in circular queue.

Q.3. Answer following in detail: (any two)

14

- (a) Compare dynamic memory allocation and static memory allocation. Which is better ? Justify your answer with an example.
- (b) What is link list ? Write an algorithm / program to insert a node at particular position in singly link list.
- (c) Explain stack. Write an algorithm to perform various operations on stack.

Q.4. Answer following in detail (any two)

14

- (a) Explain AVL Tree in detail.
- (b) What is searching ? Explain the difference between binary search and linear search. Also write an algorithm for linear search.
- (c) What is sorting ? Explain which sorting technique is faster. Also write an algorithm / program to sort an element using Quick Sort.

Q.5. Answer following in detail (any two)

14

- (a) Explain Tower OF Hanoi with an example.
- (b) Explain 2-way merge sort with an example.
- (c) Explain Simulation.

S.Y.B.C.A. (Sem.III) (CBCS) Examination

March / April - 2018

Data Structures

Time : 3 Hours]

[Total Marks : 70

Instructions:

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Name of the Examination:

☐ Second Year B.C.A. (Sem. 3)

Name of the Subject :

☐ 303: Data Structures

Subject Code No.:

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Student's Signature

(2) Write to the point.

(3) Provide examples and diagrams wherever appropriate/ necessary.

(4) Figures to the right indicate full marks to the question.

Q.1. Answer Following: (Any Seven)

14

(1) What do you mean by link list? List out types of link list.

(2) What is recursion?

(3) What is the difference between Sequential and Binary Search?

(4) Differentiate between liner and non-liner data structure.

(5) Explain D-Queue.

(6) Define the term: Simulation

(7) Explain the difference between Singly and Doubly link list.

(8) Which condition is not required in dynamic stack?

Q.2. Do as Directed : (Any Two)

14

- (a) Explain 2-3 trees in detail.
- (b) What is stack? Write an algorithm to perform various operations on stack.
- (c) What is sorting? Explain which sorting technique is faster. Write an algorithm to sort an element using Insertion Sort.

Q.3. Do as Directed. : (Any Two)

14

- (a) Write a short note on storage representation of binary tree.
- (b) Write an algorithm to insert and delete elements in Output restricted D-queue.
- (c) Write an algorithm to insert and delete elements in Singly link list.

Q.4. Do as Directed : (Any Two)

14

- (a) Write an algorithm for binary search.
- (b) Compare dynamic memory allocation & static memory allocation. Which is better? Justify your answer with suitable examples.
- (c) What is Binary Tree? Explain traversal operation on binary tree.

Q.5. Write Notes on Following : (Any Two)

14

- (a) Tower of Hanoi
- (b) Quick sort
- (c) AVL tree

S.Y.B.C.A. SEM - III (CBCS) Examination
March / April - 2019
Data Structures
(Old or New to be mentioned where necessary)

Time : 3 Hours]

[Total Marks : 70

Instructions:

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| <p>Fill up strictly the details of signs on your answer book</p> <p>Name of the Examination: <input type="checkbox"/> Second Year B.C.A. (Sem. 3)</p> <p>Name of the Subject : <input type="checkbox"/> 303: Data Structures</p> <p>Subject Code No. <input type="text" value="3"/> <input type="text" value="5"/> <input type="text" value="3"/> <input type="text" value="9"/></p> | <p>Seat No.: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <div style="border: 1px solid black; height: 80px; margin-top: 10px;"></div> <p align="center">Student's Signature</p> |
|---|---|

- (2) Write to the point.
- (3) Provide examples and diagrams wherever appropriate / necessary.
- (4) Figures to the right indicates full marks to the question.

Q.1. Answer Following: (Any Seven)

(14)

1. What is TOP pointer in stack?
2. Explain difference between Simple queue and Circular queue.
3. Differentiate between Singly link list and doubly link list.
4. Explain simple, strictly and complete binary tree.
5. Convert Infix to postfix:- $A/(B - C + D) * E + F/G$.
6. Explain sibling and forest in tree.
7. Give polynomial representation of $2x^2 + 3xy + y^2 + z^2$.
8. Find the address of $a[2][1]$ element of an 2 dimension integer row major array, if base address is 1050.
9. What will be the position of front and rear if circular queue is full?
10. Which condition is not required in dynamic stack?

Q.2. Answer the following. (Any Two) (14)

1. Explain 2:3 trees in details.
2. What is stack? Write algorithm for all stack operation.
3. What is D-queue? Write an algorithm to insert & delete elements from Output restricted D-queue.

Q.3. Answer the following. (Any Two) (14)

1. What is queue? List out types of queue. Write an algorithm for circular queue.
2. What is sorting? Explain which is sorting technique is faster. Also write an algorithm to sort an element using Quick Sort.
3. What is searching? Differentiate between linear search and binary search. Write an algorithm for binary search.

Q.4. Answer the following. (Any Two) (14)

1. Write algorithm/program to create and delete node in singly link list.
2. Write an algorithm to convert infix expression to prefix.
3. Explain Insertion sort in detail.

Q.5. Write a Short note for the following. (Any Two) (14)

1. Simulation.
2. Tower of Hanoi.
3. Storage representation of binary tree.
