Total No. of Questions : 8]

SEAT No. :

**PD-4097**

[Total No. of Pages : 3

# [6402]-57
# S.E. (I.T.)
# DATA STRUCTURE AND ALGORITHM (DSA)
## (2019 Pattern) (Semester-III) (214443)

*Time : 2½ Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8 .***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

***Q1)*** a) Convert following Infix Expression to Postfix and evaluate using stack (A/(B-C+D))*(E-F)
A = 100 B =20 C= 1 D=6 E= 6 F=2 **[6]**

b) Explain stack PUSH and POP operations with example. **[6]**

c) Explain Priority Queue with example. **[6]**

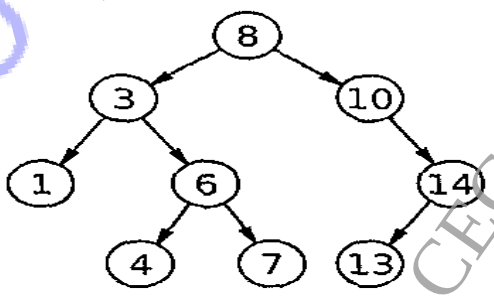
OR

***Q2)*** a) Convert following Infix Expression to Prefix and evaluate using stack ((A + B) — C * (D / E))
A=10 B=10 C=6 D=15 E=5 **[6]**

b) Explain stack using Linked List with example. **[6]**

c) Explain Implicit stack and explicit stack with example. **[6]**

***Q3)*** a) **[6]**




In a given BST state the output of Inorder, preorder, postorder, level wise traversals. Also draw mirror image.

***P.T.O.***

b) Explain recursive algorithm to display height of Binary Tree. **[6]**

c) Construct BST from below data

Inorder-7, 9, 4, 2 ,5,1, 3, 6, 8

Preorder-1, 2, 4, 7, 9, 5, 3, 6, 8 **[5]**

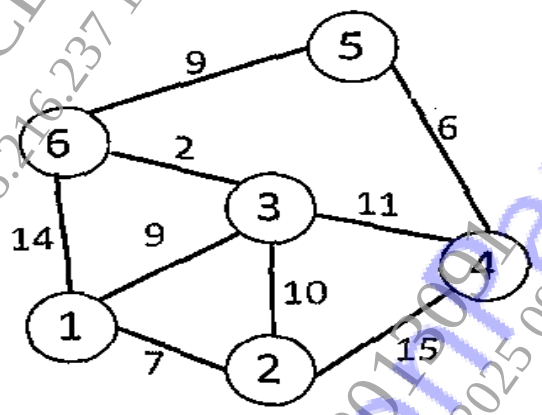
OR

***Q4)*** a) Construct the expression tree from the following postfix expression using stack.AD * BC+ - **[6]**

b) State and Explain the algorithm to search data in BST. Give example. **[6]**

c) Explain advantages and disadvantages of TBT. **[5]**

***Q5)*** a)



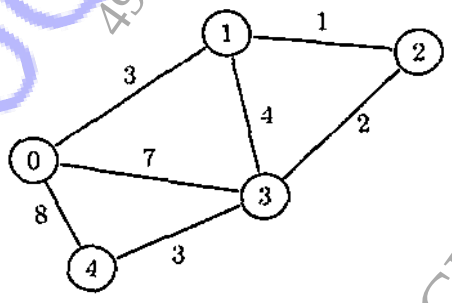

If '1' is the resource, explain step by step minimum spanning tree by 'Prims' algorithm. **[6]**

b) Explain with example by which methods Graph is represented? **[6]**

c) Explain the heap sort technique with the help of example. **[6]**

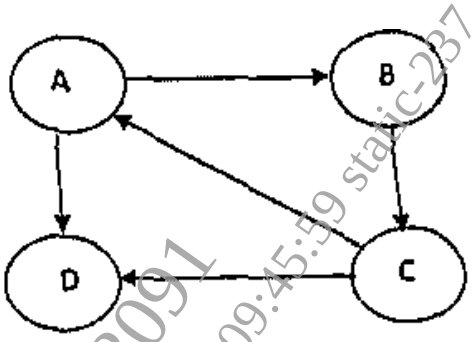
OR

***Q6)*** a)




If '1' is the source, find the shortest path from source to all vertices, using Dijkstra's algorithm. Show answer step by step. **[6]**

b)




Show the output of DFT using stack. Use 'A' as a starting node. **[6]**

c) Explain with example OBST. **[6]**

***Q7)*** a) Create the hash table using Linear Probing

Table size : 12

Data : 3, 2, 46, 6, 11, 13, 53, 12, 70, 90

Hash function: data% table size **[6]**

b) Explain in brief any 3 Collision resolution techniques. **[6]**

c) Compare sequential file and direct access file with example. **[5]**

OR

***Q8)*** a) Explain chaining without replacement with example. **[6]**

b) Explain with example different types of Hash functions. **[6]**

c) Differentiate 'ifstream' and 'ofstream' with example. **[5]**

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Total No. of Questions : 8]

SEAT No. :

**PD4101**

[Total No. of Pages : 2

# [6402]-61
# S.E. (Information Technology)
# DATABASE MANAGEMENT SYSTEM
# (2019 Pattern) (Semester - IV) (214452)

*Time : 2½ Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6. Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

***Q1)*** a) What is view in SQL and how it is define? Discuss the problem that may arise when one attempt to update views. How views are typically updated? **[8]**

b) Write a note on Database modification using SQL. **[6]**

c) Differentiate between: WHERE and HAVING clauses in SQL. **[4]**

OR

***Q2)*** a) Describe the circumstances in which you would choose to use embedded SQL rather than using SQL alone or using only a general purpose programming language. Compare dynamic and embedded SQL with suitable example. **[8]**

b) With suitable example explain SQL aggregate functions. **[6]**

c) Explain the concept of trigger with suitable example. **[4]**

***Q3)*** a) Define BCNF? How does it differ from 3NF? Why is it consider a stronger form of 3NF? **[7]**

b) Relation R (A,B,C,D,E) having following set of FD. Convert it to 3NF and also check whether it is in BCNF or not. **[6]**

$A \rightarrow BD,\ B \rightarrow C,\ D \rightarrow E$

c) Write a note on Measures of Query cost. **[4]**

OR

***Q4)*** a) Given a relation schema R = (A,B,C,D,E) and function dependency as $A \rightarrow C$, $C \rightarrow D$, $CE \rightarrow A$, $B \rightarrow C$, $DE \rightarrow C$. Relation R is decomposed into r1= AD, r2=AB, r3 = BE, r4 = CDE, r5=AE. Decide this decomposition is lossy or lossless ? Justify. **[6]**

b) Show that with suitable example: if a relation schema is in BCNF, then it is also in 3NF. **[6]**

c) Write a note on evaluation of expression. **[5]**

***P.T.O.***