S.E.(ComputerEngineering)
DATASTRUCTURESANDALGORITHMS
(2019Pattern)(Semester-II)

Time:2½Hours]   [Max.Marks:70

Instructionstothecandidates:
1) Answer Q.1orQ.2, Q.3orQ.4,Q.5 orQ.6,Q.7or Q.8.
2) Neatdiagramsmustbedrawnwherevernecessary.
3) Figurestotherightindicatefullmarks.
4) Assumesuitabledata,ifnecessary.

Q1) a)
Drawanydirectedgraphwithminimum6nodesandrepresentgraph
usingadjacencymatrix,adjacencylistandadjacencymultilist.   **[6]**

b) Considerthegraphrepresentedbythefollowingadjacencymatrix:

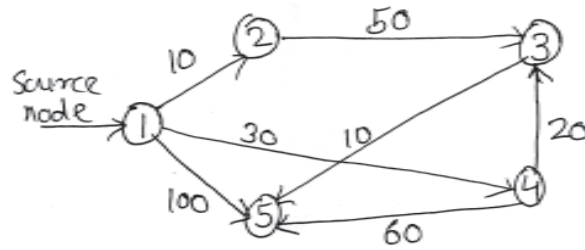|	1	2	3	4	5	6
1	0	6	1	5	0	0
2	6	0	5	0	3	0
3	1	5	0	5	6	4
4	5	0	5	0	0	2
5	0	3	6	0	0	6
6	0	0	4	2	6	0

Findminimumspanningtreeofthisgraphusingprim'sAlgorithm.

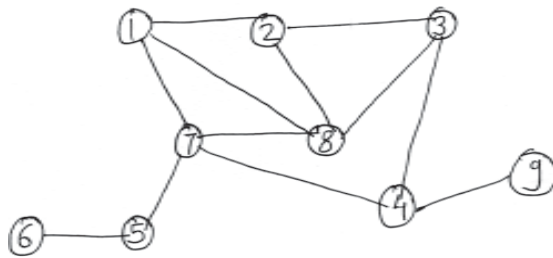c) Writeashortnoteontopologicalsorting.   **[6]**

OR

Q2) a) Writenon-recursivepseudoforDepthFirstSearch(DFS).   **[6]**

b) Consider the given graph and find the shortest path by using
Dijkstra'salgorithm.Fromsourcetoallothernodes.   **[6]**

c) ShowBFSandDFSforthefollowinggraphwithstartingvertexas1.Ex plainwithpropersteps.   **[6]**

Q3)a)   Explainwithexample   **[6]**
i)   Red-BlackTree
ii)   SplayTree

b)   ConstructAVLtreeforfollowingsequence of keys.   **[6]**
1, 2,3,4, 8,7,6,5, 11,10

c)   WhatisOBSTindatastructure?andwhatareadvantagesofOBST?**[5]**

OR

Q4)a)   Explainthefollowing:
i)   Staticanddynamictreetableswithsuitableexample.   **[3]**
ii)   Dynamicprogrammingwithprincipleofoptimality.   **[3]**

b)   Writeshortnoteon: **[6]**
i)   AAtree
ii)   K-dimensionaltree

c)   ExplainAVLtreerotationswithexample.   **[5]**

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Q5) a)   ConstructBtreeoforder5forthefollowingdata: [6]
             78,21,14,11,97,85,74,63,45,42,57

      b)   ExplainB+treedelectionwithexample.   [6]

      c)   WhatisB+tree?Givestructureofit'sinternalnote.Whatisthedifferenc
             ebetweenBandB+tree.   [6]

OR

Q6) a)
             BuildB+treeoforder3forthefollowingd
             ata:
             F,S,Q,K,C,L,H,T,V,W,M,R   [6]

      b)   WriteanalgorithmofBtreedeletion.   [6]

      c)   Explain with example trie.tree. Give advantage and applications
             of trietree.   [6]

                                                              Q7) a)
             Definesequentialfileorganization.Giveit'sadvantagesanddisadvantages.
                                                                          [6]

      b)   Whatisfile?Listdifferentfileopeningmodesinc++.Explainconcept
             ofinvertedfiles.   [6]

      c)   Writeshortnoteonexternalsort.   [5]

OR

Q8) a)
             AwriteaC++programtocreateafile.Insertrecordsintothefilebyope
             ningfileinappendmode.Searchforaspecificrecordintofile.[6]

      b)   Sortthefollowingelementsusingtwowaymergesortwithm=3.
             20,47,15,8,9,4,40,30,12,17,11,56,28,35   [6]

      c)   Explainindexedsequentialfileorganization.Compareitwithdirectacc
             essfile.   [5]