Computer Programming Language - Test 8

Total points 55/60

Total Marks: 60

Email *

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0 of 0 points

Name of the student *

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Enrollment Number (Write Completely and in CAPITAL Ex: BT18ECE001) *

MT21MCS013

Your Academic Programme *

- [ ] B.ARCH
- [ ] B.TECH
- [x] M.TECH
- [ ] M.Sc

Your Branch / Specialisation *

- ( ) B.Arch
- ( ) B.Tech-CIVIL
- ( ) B.Tech-MECH
- ( ) B.Tech-MME
- ( ) B.Tech-CSE
- ( ) B.Tech-ECE
- ( ) B.Tech-EEE
- ( ) B.Tech-CHEMICAL
- ( ) B.Tech-MINING
- ( ) M.Tech-CAD/CAM
- ( ) M.Tech-HPE
- ( ) M.Tech-IE
- ( ) M.Tech-MATERIALS ENGINEERING
- ( ) M.Tech-PROCESS METALLURGY
- (•) M.Tech-CSE
- ( ) M.Tech-COMMUNICATION
- ( ) M.Tech-IPS
- ( ) M.Tech-PED
- ( ) M.Tech-VLSI & NANOTECH
- ( ) M.Tech-SDE
- ( ) M.Tech-STR
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- ( ) M.Tech-CHEMICAL
- ( ) M.Tech-CTM

- M.Tech-ENV
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- M.Tech-EXCV
- M.Sc-Maths
- M.Sc-Chemistry
- M.Sc-Physics

Your Training BATCH *

- BATCH 1
- BATCH 2
- BATCH 3

Quiz Questions 55 of 60 points

✓ Which of the following is false about a binary search tree? * 1/1

- The left child is always lesser than its parent
- In order sequence gives decreasing order of elements ✓
- The left and right sub-trees should also be binary search trees
- The right child is always greater than its parent

✓ What is the speciality about the inorder traversal of a binary search tree? * 1/1

- (●) It traverses in an increasing order ✓
- ( ) It traverses in a non increasing order
- ( ) It traverses based on priority of the node
- ( ) It traverses in a random fashion

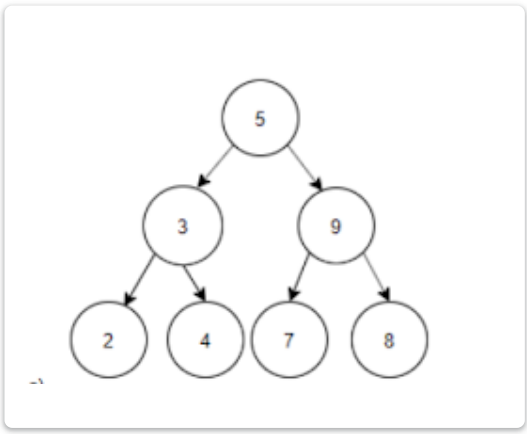
✓ What are the conditions for an optimal binary search tree and what is its advantage? * 1/1

- (●) The tree should not be modified and you should know how often the keys are accessed, it improves the lookup cost ✓
- ( ) You should know the frequency of access of the keys, improves the lookup time
- ( ) The tree can be modified and you should know the number of elements in the tree before hand, it improves the deletion time
- ( ) The tree should be just modified and improves the lookup time

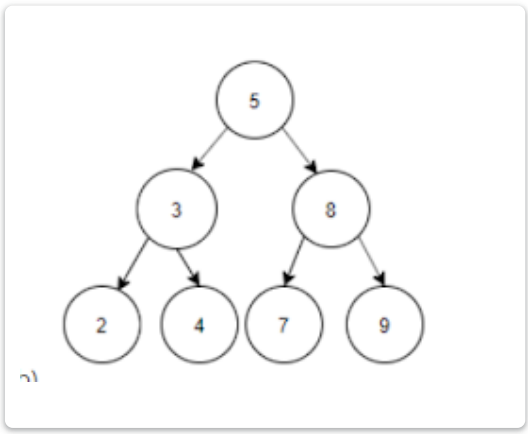
✓ Which of the following is not an advantage of trees? 1/1

- ( ) Hierarchical structure
- ( ) Faster search
- ( ) Router algorithms
- (●) Undo/Redo operations in a notepad ✓

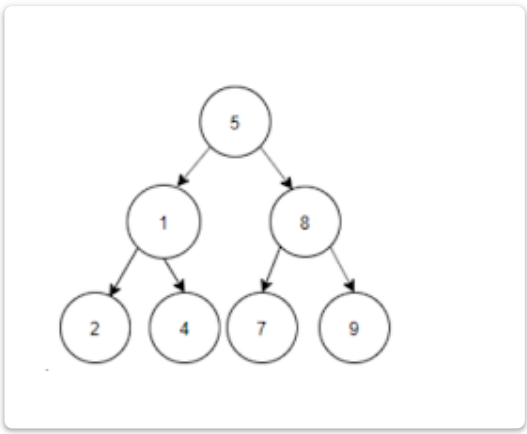
✓ Construct a binary search tree by using postorder sequence given below.Postorder: 2, 4, 3, 7, 9, 8, 5. 2/2



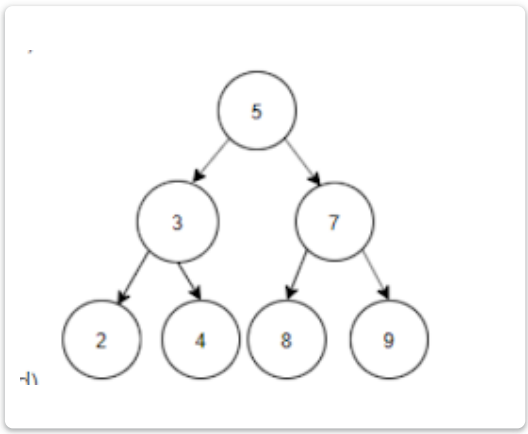
○ Option 3



◉ Option 2 ✓

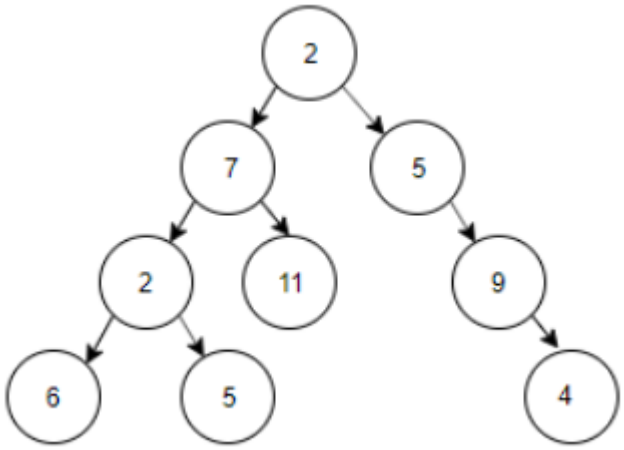


○ Option 1



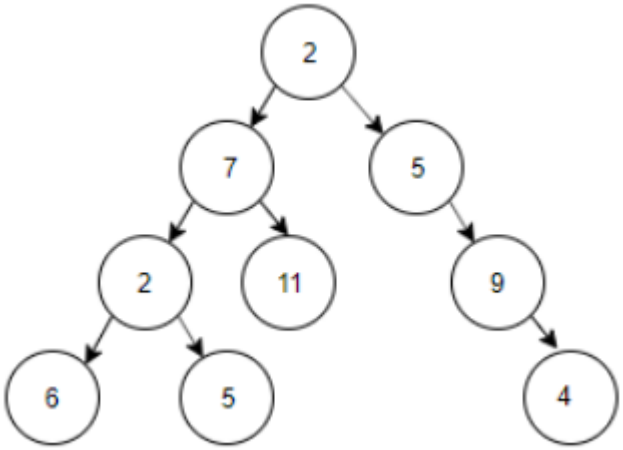
○ Option 4

✓ For the tree below, write the in-order traversal. 1/1



- ○ 6, 5, 2, 11, 7, 4, 9, 5, 2
- ○ 2, 7, 2, 6, 5, 11, 5, 9, 4
- ○ 2, 7, 6, 5, 11, 2, 9, 5, 4
- ◉ 6, 2, 5, 7, 11, 2, 5, 9, 4 ✓

✓ For the tree below, write the level-order traversal. 1/1



- ○ 2, 7, 2, 6, 5, 11, 5, 9, 4
- ◉ 2, 7, 5, 2, 11, 9, 6, 5, 4 ✓
- ○ 2, 5, 11, 6, 7, 4, 9, 5, 2
- ○ 2, 7, 5, 6, 11, 2, 5, 4, 9

✓ Which of the following graph traversals closely imitates level order traversal of a binary tree? 1/1

- ○ Depth First Search
- ○ Binary Search
- ○ Depth & Breadth First Search
- ◉ Breadth First Search ✓

✓ What is the possible number of binary trees that can be created with 3 nodes, giving the sequence N, M, L when traversed in post-order. 1/1

- 15
- 3
- 5 ✓
- 8

✓ The post-order traversal of a binary tree is O P Q R S T. Then possible pre-order traversal will be _____ 1/1

- T Q R S O P
- T O Q R P S
- T Q O P S R ✓
- T Q O S P R

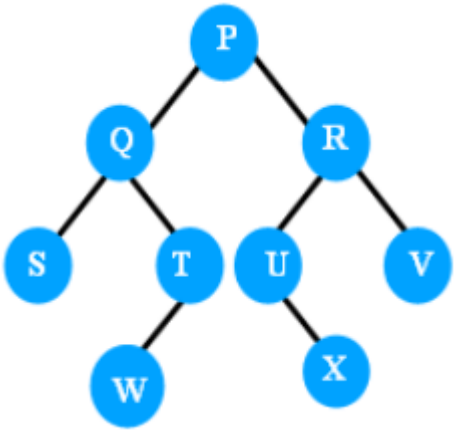
✓ A binary search tree contains values 7, 8, 13, 26, 35, 40, 70, 75. Which one of the following is a valid post-order sequence of the tree provided the pre-order sequence as 35, 13, 7, 8, 26, 70, 40 and 75? 1/1

- 7, 8, 26, 13, 75, 40, 70, 35
- 26, 13, 7, 8, 70, 75, 40, 35
- 7, 8, 13, 26, 35, 40, 70, 75
- 8, 7, 26, 13, 40, 75, 70, 35 ✓

✓ For a binary tree the first node visited in in-order and post-order traversal is same. 1/1

- ○ True
- ◉ False ✓

✓ Find the postorder traversal of the binary tree shown below. 1/1



- ○ P Q R S T U V W X
- ○ W R S Q P V T U X
- ◉ S W T Q X U V R P ✓
- ○ S T W U X V Q R P

✓ The pre-order and in-order are traversals of a binary tree are T M L N P O Q and L M N T O P Q. Which of following is post-order traversal of the tree? 1/1

- (●) L N M O Q P T ✓
- ( ) N M O P O L T
- ( ) L M N O P Q T
- ( ) O P L M N Q T

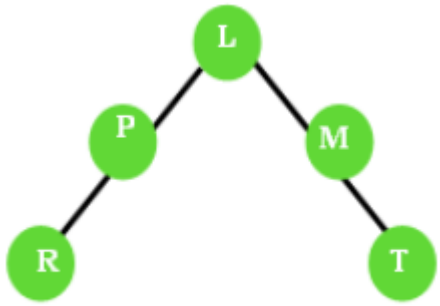
✓ To obtain a prefix expression, which of the tree traversals is used? 1/1

- ( ) Level-order traversal
- (●) Pre-order traversal ✓
- ( ) Post-order traversal
- ( ) In-order traversal

✓ Consider the following data and specify which one is Preorder Traversal Sequence, Inorder and Postorder sequences. S1: N, M, P, O, Q S2: N, P, Q, O, M S3: M, N, O, P, Q 2/2

- ( ) S1 is preorder, S2 is inorder and S3 is postorder
- ( ) S1 is inorder, S2 is preorder and S3 is postorder
- (●) S1 is inorder, S2 is postorder and S3 is preorder ✓
- ( ) S1 is postorder, S2 is inorder and S3 is preorder

✓ Figure below is a balanced binary tree. If a node inserted as child of the node R, how many nodes will become unbalanced? 1/1



- ○ 2
- ◉ 1 ✓
- ○ 0
- ○ 3

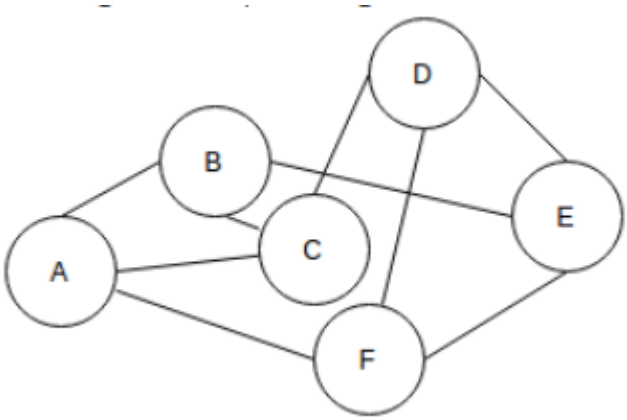
✓ Which of the following statements for a simple graph is correct? 1/1

- ◉ Every path is a trail ✓
- ○ Every trail is a path
- ○ Every trail is a path as well as every path is a trail
- ○ Path and trail have no relation

✓ What is the number of edges present in a complete graph having n vertices? 1/1

- (n*(n+1))/2
- (n*(n-1))/2 ✓
- n
- Information given is insufficient

✓ The given Graph is regular. 1/1



- True ✓
- False

✓ In a simple graph, the number of edges is equal to twice the sum of the degrees of the vertices. 1/1

- True
- False ✓

✓ A connected planar graph having 6 vertices, 7 edges contains _____ regions. 1/1

- ○ 15
- ◉ 3 ✓
- ○ 1
- ○ 11

✓ Which of the following properties does a simple graph not hold? 1/1

- ◉ Must be connected ✓
- ○ Must be unweighted
- ○ Must have no loops or multiple edges
- ○ Must have no multiple edges

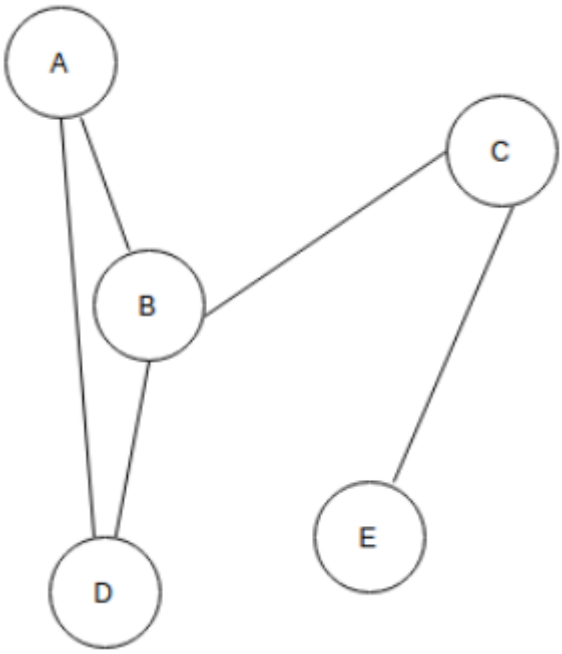
✓ For a given graph G having v vertices and e edges which is connected and has no cycles, which of the following statements is true? 1/1

- ○ v=e
- ◉ v = e+1 ✓
- ○ v + 1 = e
- ○ v = e-1

✓ Which of the following ways can be used to represent a graph? 1/1

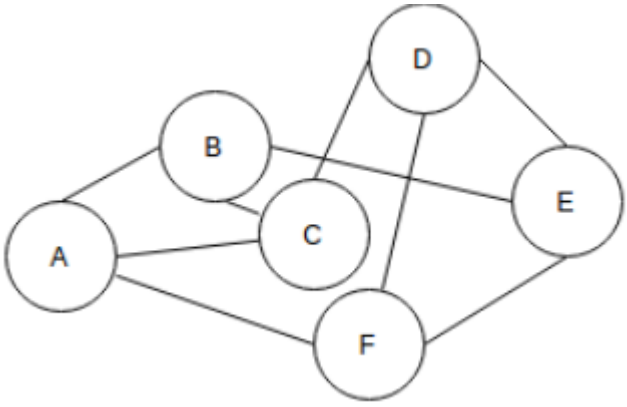
- ○ Adjacency List and Adjacency Matrix
- ○ Incidence Matrix
- ◉ Adjacency List, Adjacency Matrix as well as Incidence Matrix ✓
- ○ No way to represent

✓ In the given graph identify the cut vertices. 1/1



- ○ B and E
- ○ C and D
- ○ A and E
- ◉ C and B ✓

✓ The given Graph is regular. 1/1



- (●) True ✓
- ( ) False

✓ The number of elements in the adjacency matrix of a graph having 7 vertices is _____ 1/1

- ( ) 7
- ( ) 14
- ( ) 36
- (●) 49 ✓

✓ The time complexity to calculate the number of edges in a graph whose information in stored in form of an adjacency matrix is _____ 1/1

- ( ) O(V)
- ( ) O(E)
- ( ) O(E^2)
- (●) O(V^2) ✓

✓ For the adjacency matrix of a directed graph the row sum is the _____ degree and the column sum is the _____ degree. 1/1

- ○ in, out
- ◉ out, in ✓
- ○ in, total
- ○ total, out

✓ What is the maximum number of possible non zero values in an adjacency matrix of a simple graph with n vertices? 2/2

- ○ (n*(n-1))/2
- ○ (n*(n+1))/2
- ◉ n*(n-1) ✓
- ○ n*(n+1)

✓ Which of these adjacency matrices represents a simple graph? 1/1

- ○ [[1, 0, 0], [0, 1, 0], [0, 1, 1]]
- ○ [[1, 1, 1], [1, 1, 1], [1, 1, 1]]
- ○ [[0, 0, 1], [0, 0, 0], [0, 0, 1]]
- ◉ [[0, 0, 1], [1, 0, 1], [1, 0, 0]] ✓

✓ If A[x+3][y+5] represents an adjacency matrix, which of these could be the value of x and y. 1/1

- (●) x=5, y=3 ✓
- ( ) x=3, y=5
- ( ) x=3, y=3
- ( ) x=5, y=5

✓ Incidence matrix and Adjacency matrix of a graph will always have same dimensions? 1/1

- ( ) True
- (●) False ✓

✓ The column sum in an incidence matrix for a simple graph is _____ 1/1

- ( ) depends on number of edges
- ( ) always greater than 2
- (●) equal to 2 ✓
- ( ) equal to the number of edges

✓ What are the dimensions of an incidence matrix? 1/1

- Number of edges*number of edges
- (●) Number of edges*number of vertices ✓
- Number of vertices*number of vertices
- Number of edges * (½ * number of vertices)

✗ Time complexity to check if an edge exists between two vertices would be _____ 0/1

- O(V*V)
- (●) O(V+E) ✗
- O(1)
- O(E)

Correct answer

- (●) O(E)

✗ Suppose we run Prim's algorithm and Kruskal's algorithm on a graph G and the twoalgorithms produce minimum-cost spanning trees TP and TK, respectively. Which of the following is true? 0/2

- (●) TP must be identical to TK. ✗
- ( ) If e is a minimum cost edge in G, e belongs to both TP and TK.
- ( ) If TP is different from TK, some pair of edges in G have the same weight.
- ( ) If e is a maximum cost edge in G, e belongs to neither TP nor TK.

Correct answer

- (●) If TP is different from TK, some pair of edges in G have the same weight.

✗ Consider the following strategy to solve the single source shortest path problem with edge weights from source s. 1. Replace each edge with weight w by w edges of weight 1 connected by new intermediate nodes. 2. Run BFS(s) on the modified graph to find the shortest path to each of the original vertices in the graph. Which of the following statements is correct? 0/2

- ( ) This strategy will solve the problem correctly but is not as efficient as Dijkstra's algorithm
- (●) This strategy will solve the problem correctly and is as efficient as Dijkstra's algorithm. ✗
- ( ) This strategy will not solve the problem correctly.

Correct answer

- (●) This strategy will solve the problem correctly but is not as efficient as Dijkstra's algorithm

✓ Prim's Algorithm is used to: 1/1

- ○ Find the shortest path from one vertex to another
- ○ Find the Longest Common Subsequence
- ◉ Find the Minimum Spanning Tree ✓
- ○ Sort edge weights

✓ If a graph has n vertices, how many edges will be there in its Minimum Spanning Tree? 1/1

- ○ n
- ◉ n-1 ✓
- ○ n-2
- ○ n+1

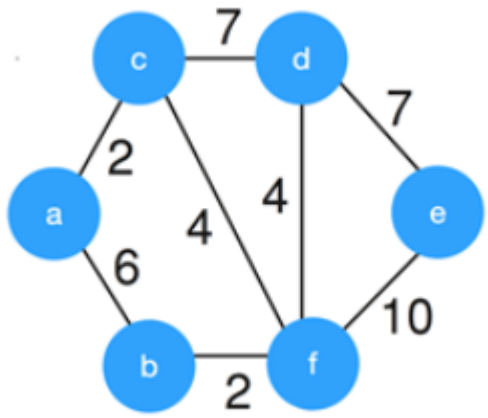
✓ Let G be an undirected connected graph with distinct edge weight. Let emax be the edge with maximum weight and emin the edge with minimum weight. Which of the following statements is false? 2/2

- ○ Every minimum spanning tree of G must contain emin.
- ○ If emax is in a minimum spanning tree, then its removal must disconnect G
- ◉ No minimum spanning tree contains emax ✓
- ○ G has a unique minimum spanning tree

✓ Kruskal's algorithm is a _____ 1/1

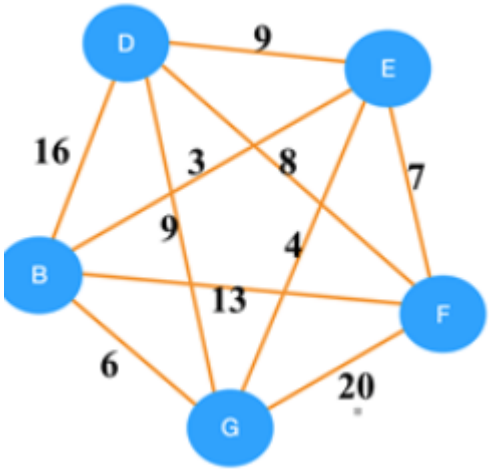
- divide and conquer algorithm
- dynamic programming algorithm
- greedy algorithm ✓
- approximation algorithm

✓ Consider the given graph. What is the weight of the minimum spanning tree using the Kruskal's algorithm? 2/2



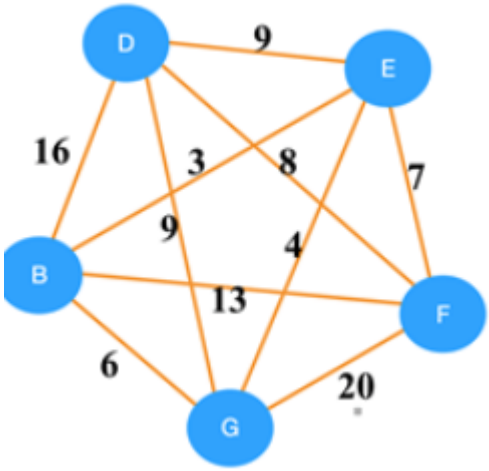
- 24
- 23
- 15
- 19 ✓

✓ Consider the following graph. Using Kruskal's algorithm, which edge will be selected first? 1/1



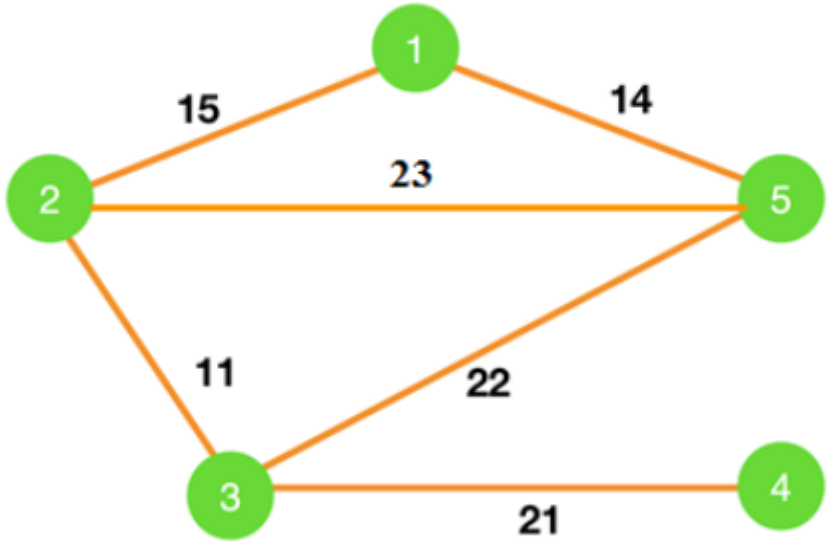
- GF
- DE
- BE ✓
- BG

✓ Which of the following edges form minimum spanning tree on the graph using kruskals algorithm? 1/1



- (B-E)(G-E)(E-F)(D-F) ✓
- (B-E)(G-E)(E-F)(B-G)(D-F)
- (B-E)(G-E)(E-F)(D-E)
- (B-E)(G-E)(E-F)(D-F)(D-G)

✓ Consider the graph shown below. Which of the following edges form the MST of the given graph using Prim's algorithm, starting from vertex 4. 1/1

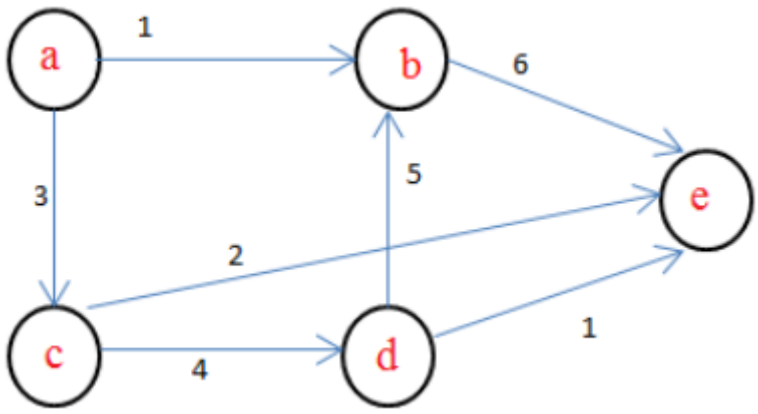


- (4-3)(5-3)(2-3)(1-2)
- (4-3)(3-5)(5-1)(1-2)
- (4-3)(3-5)(5-2)(1-5)
- (4-3)(3-2)(2-1)(1-5) ✓

✓ Which of the following is false about Prim's algorithm? 1/1

- It is a greedy algorithm
- It constructs MST by selecting edges in increasing order of their weights ✓
- It never accepts cycles in the MST
- It can be implemented using the Fibonacci heap

✓ In the given graph, identify the shortest path having minimum cost to reach vertex E if A is the source vertex. 1/1



- a-b-e
- a-c-e ✓
- a-c-d-e
- a-c-d-b-e

✓ The maximum number of times the decrease key operation performed in Dijkstra's algorithm will be equal to _____ 1/1

- Total number of vertices
- Total number of edges ✓
- Number of vertices − 1
- Number of edges − 1

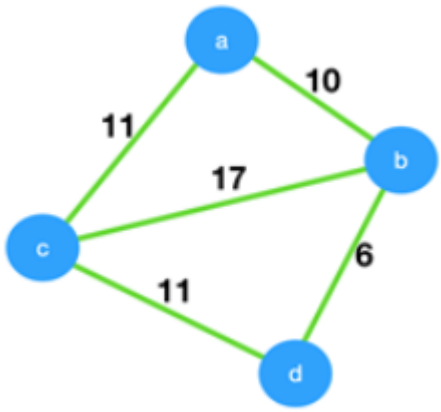
✓ Dijkstra's Algorithm cannot be applied on _____ 1/1

- ○ Directed and weighted graphs
- ◉ Graphs having negative weight function ✓
- ○ Unweighted graphs
- ○ Undirected and unweighted graphs

✓ Dijkstra's Algorithm is used to solve _____ problems. 1/1

- ○ All pair shortest path
- ◉ Single source shortest path ✓
- ○ Network flow
- ○ Sorting

✓ Consider the given graph. What is the weight of the minimum spanning tree using the Prim's algorithm, starting from vertex a? 1/1



- 23
- 28
- 27 ✓
- 11