Question - 1

SCORE: **5 points**

Graphs

Maximum degree of any vertex in a simple graph of vertices n is

- 2n - 1
- n
- n + 1
- (•) n - 1

Question - 2

SCORE: **5 points**

Graphs

Which of the following is an advantage of adjacency list representation over adjacency matrix representation of a graph?

- In adjacency list representation, space is saved for sparse graphs.
- DFS and BSF can be done in O(V + E) time for adjacency list representation. These operations take O(V^2) time in adjacency matrix representation. Here is V and E are number of vertices and edges respectively.
- Adding a vertex in adjacency list representation is easier than adjacency matrix representation.
- (•) All of the above

Question - 3

SCORE: **5 points**

Graphs

In a simple graph, the sum of degree of the vertices is equal to twice the number of edges.

- (•) True
- False

Question - 4

SCORE: **5 points**

Graphs

Given two vertices in a graph s and t, which of the two traversals (BFS and DFS) can be used to find if there is path from s to t?

- BFS
- DFS
- (•) Both DFS and BFS
- Neither BFS nor DFS

Help

Question - 5

SCORE: **5 points**

Graphs

Which algorithms can be used to most efficiently determine the presence of a cycle in a given graph? DFS or BFS?

- ( ) BFS is most efficient
- (•) DFS is most efficient
- ( ) BFS and DFS have same efficiency
- ( ) None of them

Question - 6

SCORE: **5 points**

Graphs

Given the following adjacency matrix of a graph(G) determine the number of components in the G.

```
[0 1 1 0 0 0],
[1 0 1 0 0 0],
[1 1 0 0 0 0],
[0 0 0 0 1 0],
[0 0 0 1 0 0],
[0 0 0 0 0 0].
```

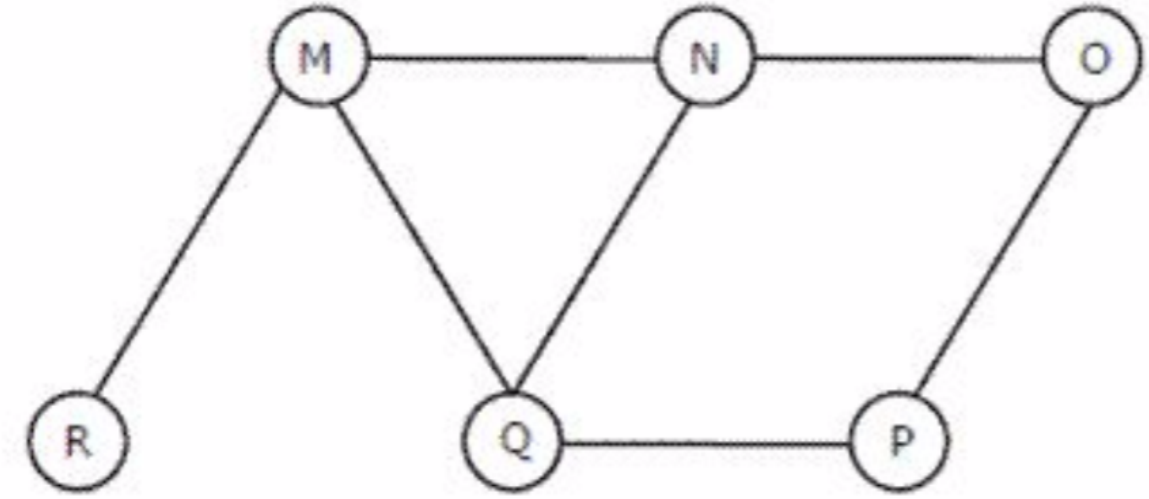
- ( ) 1
- ( ) 2
- (•) 3
- ( ) 4

Question - 7

SCORE: **5 points**

BFS - 10 points

Using Breadth First Search algorithm one possible order of visiting the nodes of the following graph is

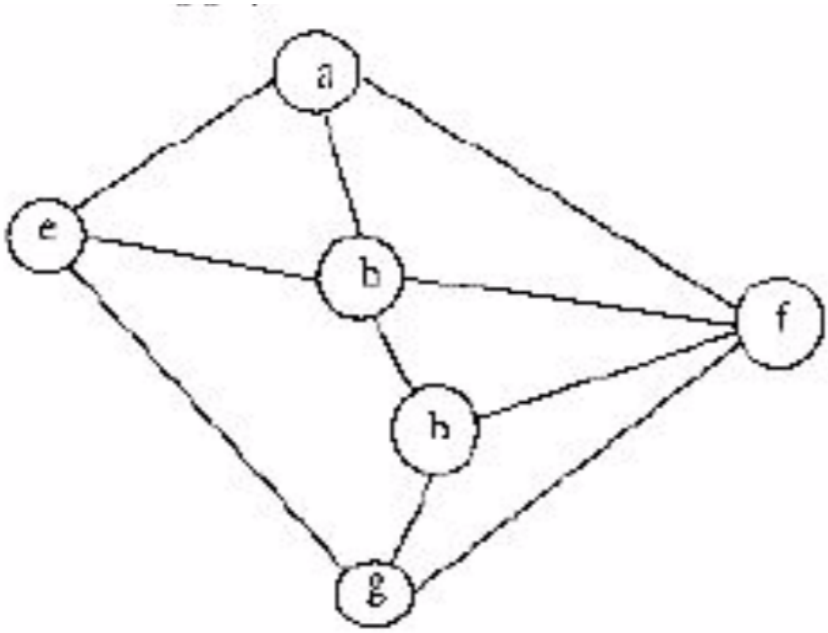


- MNOPQR
- NQMPOR
- QMNPRO
- QMNPOR

Question - 8
DFS - 10 points

SCORE: **5 points**

Consider the following graph



I) a b e g h f
II) a b f e h g
III) a b f h g e
IV) a f g h b e
Which are depth first traversals of the above graph? (10 marks)

- I, II and IV only
- I and IV only
- II, III, IV only
- I, III and IV only