

**R16**

Code No: 137CY

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, March - 2021

**GRAPH THEORY**  
(Computer Science and Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any Five Questions  
All Questions Carry Equal Marks

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- 1.a) Show that minimum number of edges in simple graph is  $n(n-1)/2$  with  $n$  vertices. [7+8]  
b) Give note on Hamilton circuit and complete graph with examples. [7+8]
- 2.a) Write floyd's algorithm for all pairs shortest path problem.  
b) Analyze and find shortest path distance in between every pair of vertices for a weighted graph (take any example). [8+7]
- 3.a) Discuss about vertex connectivity, edge connectivity and its relation.  
b) What is block and give steps to find blocks in graph. [8+7]
- 4.a) Write Kruskal's Algorithm for finding minimum spanning tree for a graph.  
b) Illustrate above algorithm with an example. [8+7]
- 5.a) Discuss about matching, max matching and perfect matching with examples.  
b) Explain Hungarian method to find max match in bipartite graphs. [7+8]
- 6.a) Give the steps to find the max independent sets in graph.  
b) What is Covering in graph and explain in detail with examples. [8+7]
- 7.a) State and show Vizing's theorem.  
b) Explain class-1 and class-2 graphs. [7+8]
- 8.a) Prove every tree with two or more vertices is 2-chromatic.  
b) Write four color problems and illustrate with an example. [7+8]

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