Code No: 137CY

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, December - 2019

GRAPH THEORY

(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Define cycle and circuit in graph.	[2]
b)	What is isomorphism and give example for isomorphic graphs?	[3]
c)	Define block and region in graph.	[2]
d)	What is connected graph and give two examples?	[3]
e)	Define Chordal graph.	[2]
f)	Write Cayley's formula.	[3]
g)	What is independent set of graph?	[2]
h)	Describe matching in graphs.	[3]
i)	What is edge chromatic number of graph?	[2]
j)	Describe class-2 graphs.	[3]

PART – B

(50 Marks)

2.a)	Prove that number of vertices with odd degree in a graph is even.	
b)	Show that if there is walk (u,v) in graph G then there exists (u-v)-path.	[5+5]
	OR	
3.a)	Justify that "A connected graph is Euler if and only if it can be decomposed into circuits"	
b)	Write a note on matrix representation of graphs and illustrate with example.	[5+5]
4.	Explain Algorithm for shortest path problem from source vertex to all vertices with an example.	[10]
	OR	
5.	Explain max flow min cut theorem and illustrate with an example.	[10]
6.	Describe Kruskal's algorithm and explain with an example.	[10]
	OR	
7.	What is Hamilton graph and write its necessary conditions and also show that Hamilton path is a spanning tree.	[10]

8. Explain procedure to find max independent set in graph and illustrate with example.[10]

OR

9. Prove if G is k-regular bipartite graph with K>0 then G has a perfect match. [10]

10.a) Discuss about clique and give example.

b) Prove that a graph with at least one edge is 2-chromatic if and only if it has no circuits of odd length. [4+6]

OR

11.a) Describe algorithm to find a proper edge coloring of a bipartite graph.

b) Explain Brooks theorem. [4+6]

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