RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Faculty of Engineering and Technology
Term-Test1 Question Paper – B.Tech.

Department : **Computer Science and Engineering**
Programme : **B. Tech. in Computer Science and Engineering**
Semester / Batch : **6th Semester 2018 Batch**
Date of Test : **17thMay 2021**
Course Code : **19CSC311A**
Course Title : **Graph Theory and Optimization**

Term Test – 1

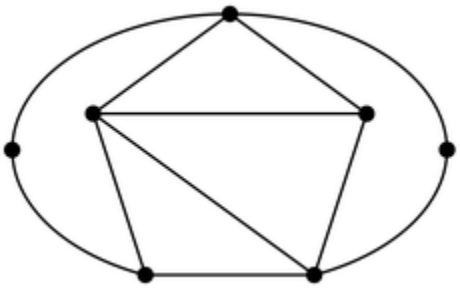
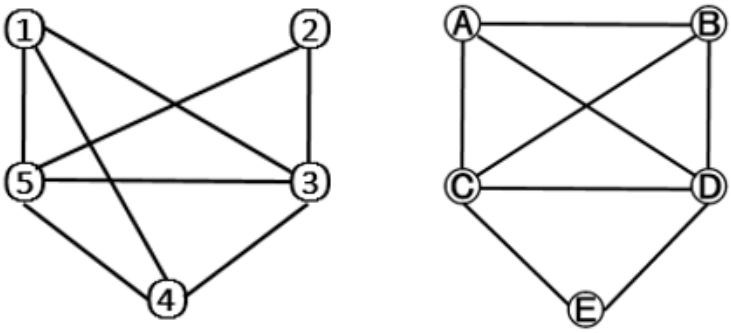
INSTRUCTIONS TO STUDENTS

1. Answer all **five** Questions
2. Use of non-programmable scientific calculator is permitted
3. Missing data may be appropriately assumed
4. Notations used have usual meaning
5. **Upload the scanned answer sheets in PDF format within the stipulated time to**
   Section A:
   https://u.pcloud.com/#page=puplink&code=8OkkZXEv38yqQ3O8nUsUovV6UBYDGlRV0
   Section B:
   https://u.pcloud.com/#page=puplink&code=QOkkZjFplaM45r7HE9baCKxLSahEd5Rsk
   Section C:
   https://u.pcloud.com/#page=puplink&code=YOkkZ9NRSRh3eUe5bsTKJ9qzne0414Tty

Maximum Duration: 1 Hour and 15 Minutes **Maximum Marks: 25**

IMPORTANT
You may retain the question paper for future reference

Q. No.	Question	Marks	CO
1	Describe the characteristics used to classify a graph as (i) Hamiltonian graph (ii) Euler graph. Draw the graphs required to aid your description.	5	1
2	a. Determine the number of regions in the planar graph given below using Euler's formula. Validate the formula by marking the regions on the graph.	3	1

			
	b. Show, by drawing, that complete bipartite graphs $K_{2,3}$ and $K_{2,4}$ are planar graphs.	**2**	**3**
3	Determine whether the following graphs are isomorphic by appropriately mapping the edges and vertices. 	**5**	**2**
4	Draw the structure of a K-Regular Graph. Show that any simple K_n graph is $(K-1)$ Regular.	**5**	**2**
5	Determine the number of vertices of graph G=(V,E) in the following cases: • G has 16 edges and all vertices of degree 4 • G is regular with 15 edges • G has 10 edges with 2 vertices of degree 4 and all other vertices of degree 3	**5**	**3**

CO (ILO) – Course Outcomes:-

1. Describe the concepts, theories and techniques of graph theory and discrete optimization
2. Explain the principles of graph theory, discrete optimization and their applications in Computer Science and Engineering
3. Identify and apply appropriate approach from graph theory and discrete optimisation to formulate a given problem
4. Design graph theory and discrete optimisation based algorithms to solve problems in Computer Science and Engineering
5. Synthesize efficient algorithms for problems in Computer Science and Engineering using graph structures and discrete optimisation methods
6. Evaluate the utility of discrete optimisation and graph structures for modelling and analysis of computing systems