

Indian Institute of Engineering Science and Technology, Shibpur
B. Tech. (6th Semester) Mid Term Examination, 2022
Graph Theory (CS 3224)

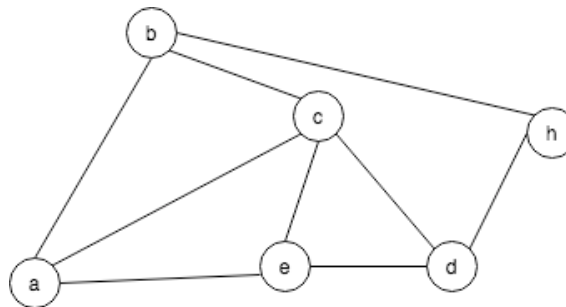
Full Marks: 30

Time: 45 minutes

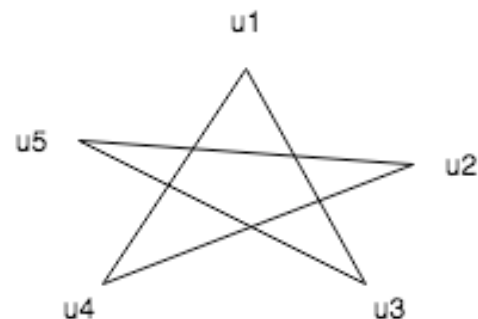
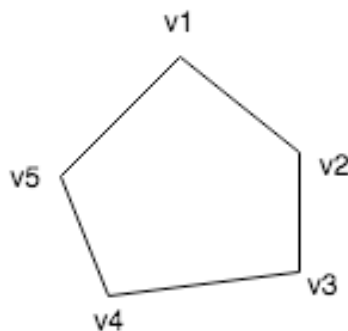
Attempt all Questions.

(10 x 3)

1. (a) What is meant by complement of a graph? Find the complement of the following graph.



- (b) What do you mean by isomorphic graphs? Determine whether the following two graphs are isomorphic. Justify your answer.



2. (a) Define Unicursal graphs. Prove that a connected graph is unicursal if and only if it has exactly two vertices of odd degree.
- (b) Consider vertex 'c' of the graph given in question 1. (a) as the starting vertex, search the graph using both BFS and DFS Algorithms.
3. (a) Prove that in a complete graph with n vertices there are $(n - 1)/2$ edge-disjoint Hamiltonian cycles, if n is an odd number, $n \geq 3$.

(b) Define the Ring sum of two graphs and find it for the following two graphs.

