Roll No.												

PRESIDENCY UNIVERSITY
BENGALURU

School of Information Science

Mid-Term Examinations - November 2024

Semester: III
Course Code: MAT2028
Course Name: Graph Theory
Program: BCA-AIML

Date: 06-11-2024
Time: 11:45am – 01:15pm
Max Marks: 50
Weightage: 25%

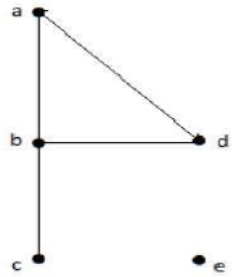
Instructions:

(i) Read all questions carefully and answer accordingly.
(ii) Do not write anything on the question paper other than roll number.

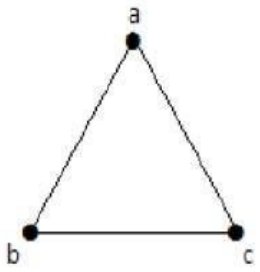
Part A

Answer ALL the Questions. Each question carries 2 marks. **5Qx2M=10M**

1	Define a pseudo graph and give one example.	2 Marks	L1	CO1
2	Find the degree of all the vertices for the given graph.	2 Marks	L1	CO1

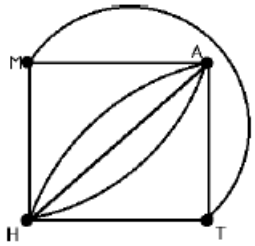
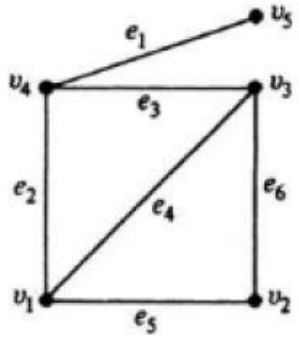
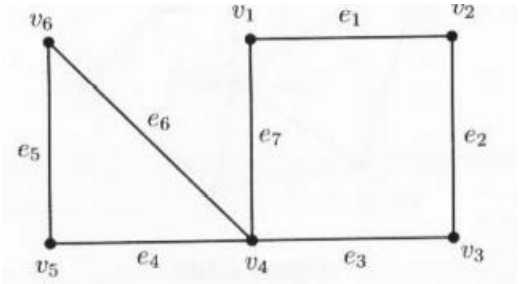


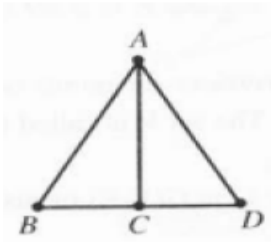
3	Can there be a graph with three vertices of degree 2 and one vertex of degree 3?	2 Marks	L1	CO1
4	Draw a cubic graph.	2 Marks	L1	CO2
5	Find the number of regions using Euler's formula for a given graph.	2 Marks	L1	CO2



Part B

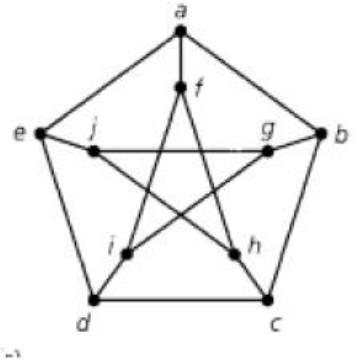
Answer ALL Questions. Each question carries 10 marks. **4QX10M=40M**

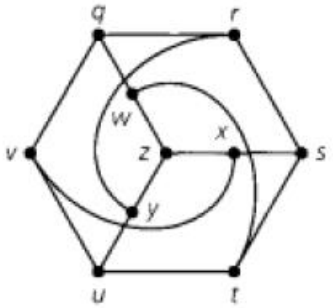
6		What are the degree and neighborhood of all the vertices of the graph below 	10 Marks	L2	CO1
		OR			
7		Represent the graph below using Adjacency matrix and Incidence Matrix 	10 Marks	L2	CO1
8	**8a**	Interpret the nature of the walks i) V1e1v2e2v3e3v4e4v5 ii) V1e1v2e2v3e3v4e7v1 iii)V6e5v5e4v4e3v3e2v2e1v1e7v4e6v6 	5 Marks	L2	CO1
	8b	Determine the number of different paths of length 2 in the graph shown below	5 Marks	L2	CO1



OR

9		Determine the graphs are isomorphic or not?	10 Marks	L2	CO1

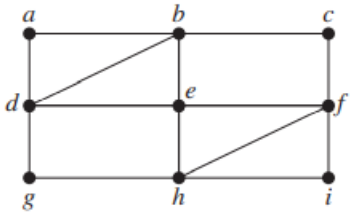




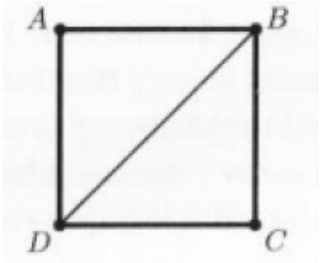
10		Discuss the Konigsberg bridge problem in detail.	10 Marks	L3	CO2

OR

11	11a	Check if the graph given has Euler path and it is an Euler graph.	5 Marks	L2	CO2



	11b	Check if the graph given has Hamilton path and it is a Hamilton graph.	5 Marks	L2	CO2



12		Explain why the complete bipartite graph $K_{3,3}$ is a non-planar graph.	10 Marks	L2	CO2

OR

13		How can the final exams at the university be scheduled so that no student has two exams at the same time. Suppose that the following pairs of courses have common students as follows 1 & 2, 1 & 3, 1 & 4, 1 & 7, 2 & 3, 2 & 4, 2 & 5, 2 & 7, 3 & 4, 3 & 6, 3 & 7, 4 & 5, 4 & 6, 5 & 6, 5 & 7, 6 & 7.	10 Marks	L3	CO2