

Reg. No.:



Y7660

Name:

University of Kerala

Fourth Semester FYUGP Degree Examination, May 2026

Discipline Specific Elective

MATHEMATICS

UK4DSEMAT200 - Elementary Graph Theory

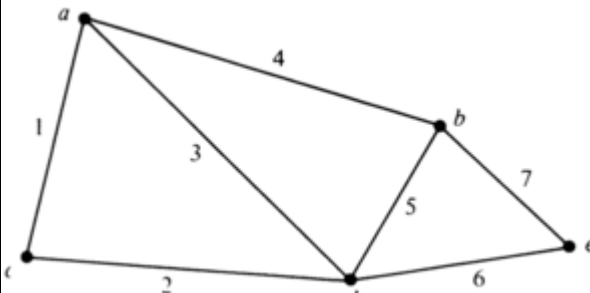
Academic Level: 200-299

2024 Admission

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark Each.Answer all questions

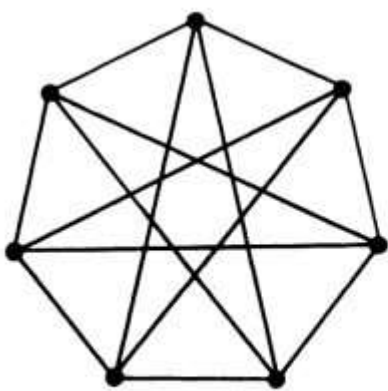
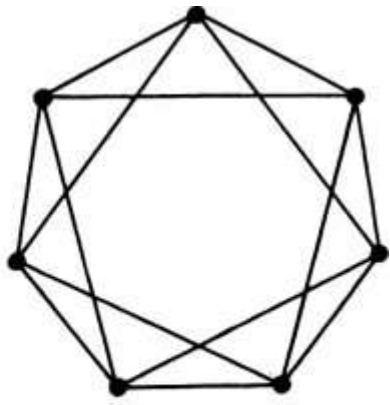
Qn No.	Question	CL	CO
1	Define an event.	RE	1
2	State the necessary and sufficient condition for a graph to be an Euler graph.	RE	2
3	Draw a regular graph which is not complete.	UN	3
4	State true or false, justify: The subgraph of a regular graph is regular.	UN	3
5	Check whether the given graph is Euler or unicursal? 	UN	3
6	Distinguish between a pendant vertex and an isolated vertex.	UN	3

Part B. 8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	How many ways are there to choose at most seven books from a pool of ten books?	UN	4
8	Give an example of a circuit which is not a cycle.	UN	2
9	Define Hamiltonian circuit of a graph. Draw a graph which has a Hamiltonian circuit.	AP	3

Qn No.	Question	CL	CO
10	Find the number of positive integers that are smaller than 100 and are not divisible by 5 nor 7.	AP	1

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	A) Construct a graph with 8 vertices where: Exactly two vertices have odd degree and all others have even degree. Show that it has an Euler path. Draw and justify. OR B) Create a graph with 7 vertices that has an Euler path but not an Euler circuit.	AP	3, 3
12	A) Show that the two graphs in the following figure are isomorphic.   (a) (b) OR B) Draw all possible vertex disjoint subgraphs of the following graph. Is the Graph is Eulerian? Justify.	AN	3, 3

Qn No.	Question	CL	CO
13	A) Show that the maximum number of edges in a simple graph with n vertices is $n(n-1)/2$. Find the number of edges of a complete graph with 4 vertices. OR B) Explain Königsberg Bridge Problem and draw the graph representing the same.	EV	2, 2
14	A) Create a real-life survey problem involving three overlapping groups and solve the problem. OR B) Construct two graphs G_1 and G_2 on the same vertex set such that: their union is a complete graph and their intersection is a disconnected graph. Draw all three graphs and justify your construction.	CR	4, 4