K26FY0663 Pages: 2 Reg No:.....
Name:.....

Fourth Semester FYUGP Degree (Reg) Examination April 2026

KU4VACMAT202 - GRAPH THEORY

2024 Admission onwards

Time : 1.5 hours Maximum Marks : 50

Section A

Answer any 6 questions. Each carry 2 marks.

1. Explain Euler tour.
2. State Konigsberg bridge problem.
3. Define graph and give an example.
4. Define a tree in Graph Theory.
5. Define matching in a graph G.
6. Define plane graph.
7. State Euler's polyhedron formula.
8. When is a map said to be k-face colourable?

Section B

Answer any 4 questions. Each carry 6 marks.

9. Represent Personnal Assignment Problem using graphs.
10. Represent using graphs, the problem of assigning n qualified teachers to a set of n classes.
11. State the Jordan Curve Theorem and explain its significance in the study of planar graphs.
12. Name all the regular polyhedra. Draw the graph of atleast two of them.
13. Represent the street map of a city using graphs.
14. Find the chromatic number of a cycle with 4 vertices.

Section C

Answer any 1 questions. Each carry 14 marks.

15. (a) Define Euler trail and Euler tour with example.
    (b) Draw a Hamiltonian graph.
16. (a) How would you represent a city's air routes as a graph to find the cheapest route between two cities? Define what the vertices and edges would represent.
    (b) Draw a graph with $v = 1, 2, 3, 4, E = a, b, c, d, e$ where $a = (2, 3)$, $b = (2, 4)$, $c = (1, 1)$, $d = ((1, 3)$, $e = (4, 1)$.