The Open University of Sri Lanka

B.Sc/ B.Ed Degree Programme

Applied Mathematics – Level 05

ADU5308 – Graph Theory

CAT I – Open Book Test – 2024/2025
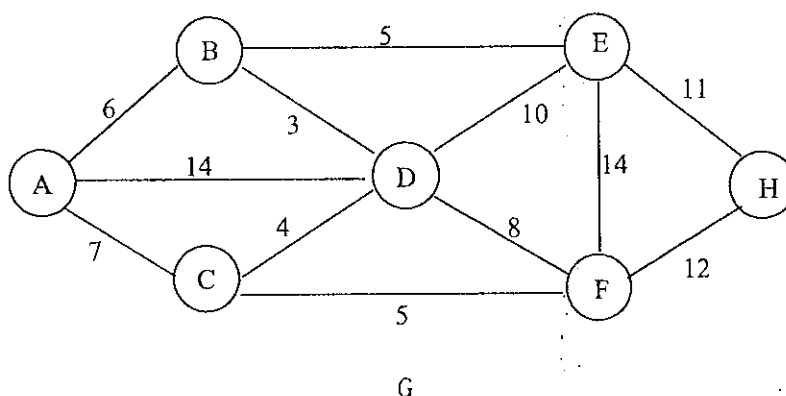
DURATION: ONE HOUR

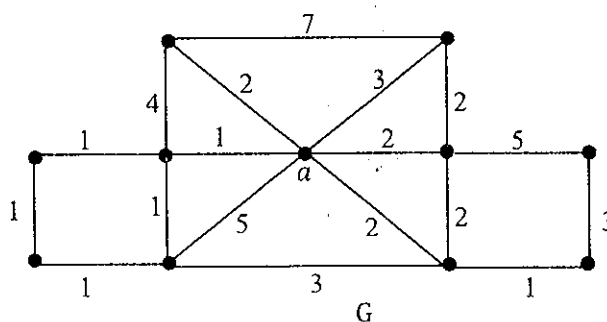Date: 21.02.2025   Time: 4.00p.m. – 5.00p.m.

ANSWER **ALL** QUESTIONS.

1.

   a) Draw the complement graph of the *wheel graph* W_5.

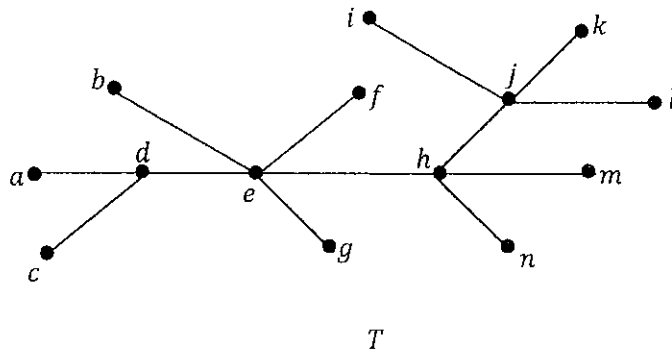   b) Use *Alternative method* to find the shortest path from A to H for the following graph G.

G

   c) Use *Prim's Greedy algorithm* to find a minimum weighted spanning tree of the following graph G, starting with the vertex a.

G

1

2.

a) Considering the following tree graph T,

T

    i.   Draw the rooted tree, choosing the vertex e as the root.

    ii.   For the rooted tree in part (i), write down the post order traversal.

b) Draw the corresponding parse tree for the mathematical expression $2y(x^2 + 5) - (3x - y)$.

c) Color the vertices of the graph G using backtracking.

G