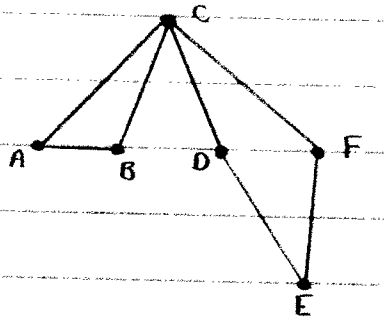
EXAM 3

NAME: SECTION:

25 pts 1.) For each network given, answer the posed questions. If an explanation is requested, you MUST provide a correct one to receive full credit.

a.) NETWORK 1:



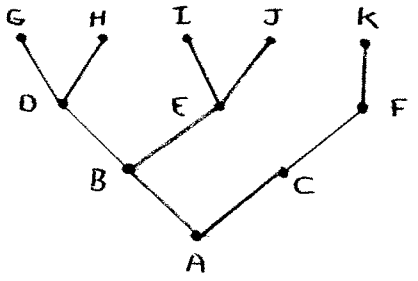
2 pts i. What is the order of this network?

2 pts ii. What is the degree of each vertex?

5 pts iii. Does this network have an Euler circuit starting at vertex A? If so, provide it. If not, explain why it does not have one.

5 pts iv. Does this network have a Hamiltonian circuit? If so, what is it? If not, explain why.

b.) NETWORK 2 :



2 pts i. What type of network is this?

a.) Complete Network

b.) Hamiltonian Network

c.) Tree Network

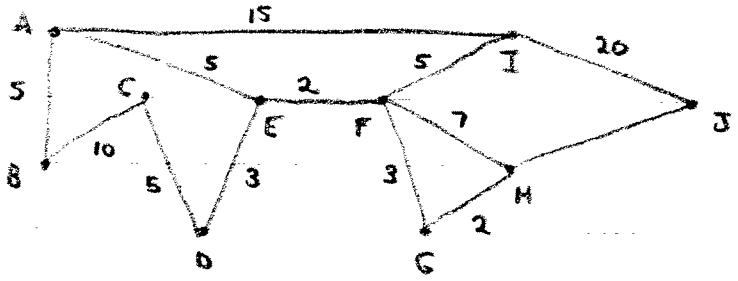
d.) None of these.

4 pts ii. Find a path from vertex D to vertex F.

5 pts iii. Does this network have an Euler circuit? If so, what is it? If not, explain why.

15 pts 2.) Do each of the following

2 pts a) Find a circuit in the following network:



3 pts b) What is the cost of a path from vertex B to vertex J? Clearly indicate the path you chose!

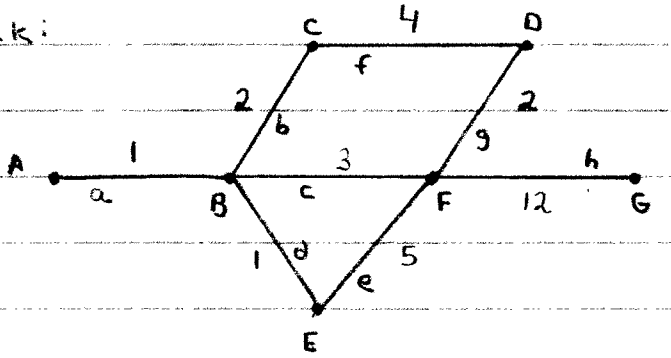
2 pts c) How many edges are there in this network?

8 pts d) Find a Hamiltonian circuit in this network. (Be careful!)

25 pts 3.) For the network given below, find a minimal cost spanning network. Demonstrate your chosen network by carefully circling the edges that should be part of the solution.

NETWORK:

12 pts



8 pts Is there more than one possible minimal cost spanning network? If so, what would you change in your solution above?

4 pts What is the cost of the spanning network?

1 pts : Multiple Choice: What type of network is this minimal-cost spanning network? IF it has a special name, what is it

i. Hamiltonian Network

ii. Tree Network

iii. Euler Network

iv. Complete Network

v. Not Classifiable

20 pts 4) The following problem deals with voting methods. Answer all posed questions.

a) True or False: In an election involving just two choices it is possible for both candidates to win a majority.

b) Consider the following election results. Who wins in each case?

Candidate A	10%
Candidate B	60%
Candidate C	30%

i) who wins by over 60% super-majority?

ii) who wins by majority?

iii) who wins by plurality?

c) Given the following preference schedule, determine who wins by a sequential runoff.

1st	A	C	B	A	C
2nd	C	A	C	B	B
3rd	B	B	A	C	A
	10	5	12	1	2

15 pts 5. Using the following table of data, do what is asked.

Cities A, B, C, D . Distance is miles

	A	B	C	D
A	-	7	12	2
B	7	-	3	1
C	12	3	-	15
D	2	1	15	-

8 pts a. Construct a network with edges as roads and vertices as cities that represents the given information. Label all vertices and edges!

3 pts b. Is there a solution to the Traveling Salesperson problem for this network? Why?

4 pts c. Suppose the salesperson wishes to begin her journey at city C and return there after traversing each road exactly once. Is this possible? Why?