

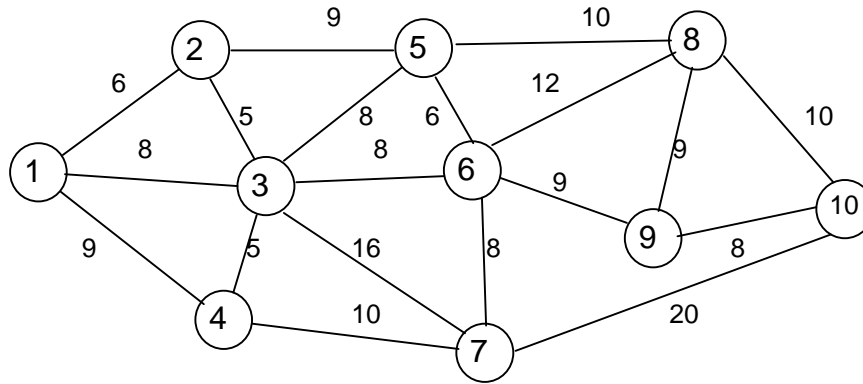
## BADM 604 Practice Test 2 Summer II 2000 Dr. Silver

Answer all the problems below. You may use notes, books, and calculators.

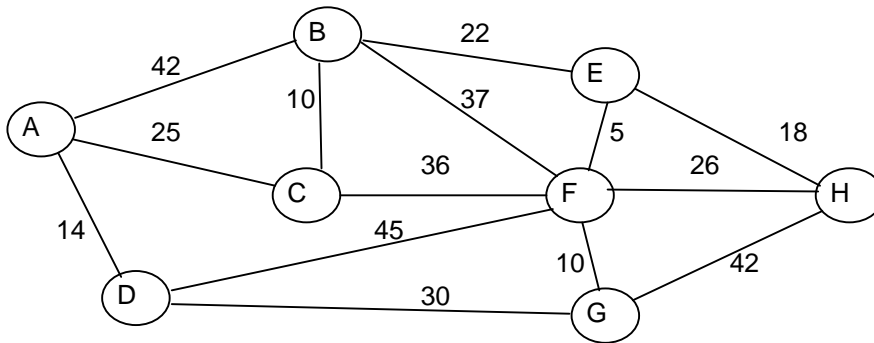
1. Each year ABC Manufacturing Company sells 120,000 tons of finished product. Setup costs are \$1000 per run and annual carrying costs per ton are \$100. Daily demand during production is 1000 tons and daily production is 2500 tons. Find the optimal number of units per run and the total inventory costs.
  
2. The NOW Computer Corporation would like to determine how many units of the NOW-100 and NOW-200 personal computers to manufacture during the current production period. Both models use a Pentium II microprocessor. The assembly times are 1.5 hours for each NOW-100 and 3 hours for each NOW-200. The firm has 3400 microprocessors and 6000 hours of assembly time. Management has specified that no more than 1000 units produced will be NOW-200 computers. If profit contributions for the models are \$500 for each Now-100 and \$750 for each NOW-200, how many units of each model should NOW manufacture and what are total profits? Assume NOW can sell all the units they manufacture.
  
3. The reference desk at a university library receives requests for assistance. Assume that a Poisson probability distribution with a mean rate of 10 requests per hour can be used to describe the arrival pattern and that service times follow an exponential probability distribution with a mean service rate of 12 requests per hour.
  - a. What is the probability that there are no requests for assistance in the system?
  - b. What is the average number of requests that will be waiting to be serviced?
  - c. What is the average time in minutes before service begins?
  - d. What is the average time at the reference desk in minutes (waiting time plus service time)?
  - e. What is the probability that a new arrival has to wait?
  
4. The table below shows the costs of transporting widgets from each of three warehouses to each of four retail outlets. Find the least-cost solution to this transportation problem.

Origin	Destination				Total
	A	B	C	D	
1	\$7	\$5	\$2	\$4	4000
2	\$6	\$3	\$3	\$3	6000
3	\$4	\$7	\$6	\$5	4000
Total	4000	4000	3000	3000	14000

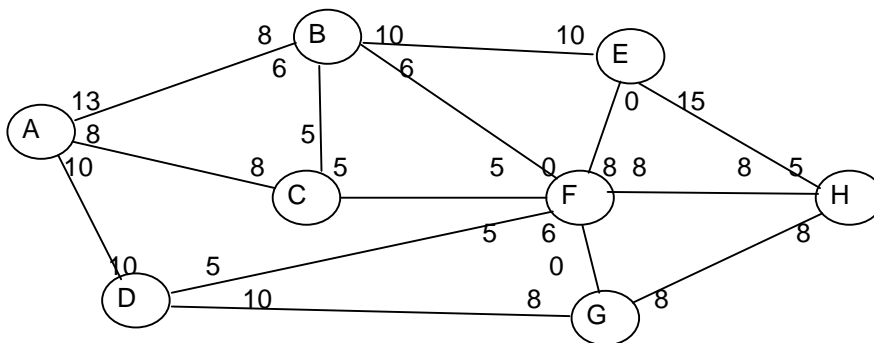
5. The diagram below shows the possible links in a network of pipes connecting office buildings in a neighborhood of a midwestern city. The numbers between links indicate the distance in hundreds of feet. What is the minimum amount of pipe needed to connect the buildings?



6. The diagram below is of a road system of a small State in rural Mexico. The times are in minutes and the nodes are towns. Find the shortest time between town A and town H.



7. The diagram below is the road system of a small county in rural South Carolina. The maximum traffic flow in cars per minute are also given. Find the maximum flow between towns A and H.



# St. Adolf's Hospital Project

8. The chart below lists the activities, sequence and expected completion times, in weeks, for the construction of St. Adolf's Hospital. Diagram the project, identify the critical path, and determine the latest start times for each of the activities.

Activity		Immediate	Expected
Letter	Activity Description	Precdecessor	Time
A	Select administrative and medical staff	---	12
B	Select site and do site survey	---	9
C	Select equipment	A	10
D	Prepare final construction plans and layout	B	10
E	Bring utilities to the site	B	24
F	Interview applicants and fill postitions in nursing, support staff, maintenance, and security	A	10
G	Purchase and take delivery of equipment	C	35
H	Construct the hospital	D	40
I	Develop an information system	A	15
J	Install the equipment	E,G,H	4
K	Train nusrses and support staff	F,I,J	6