

AT23-2 EM384 Quiz 2 (Solution)

* This form will record your name, please fill your name.

1

The following transportation problem is balanced. (2 Points)

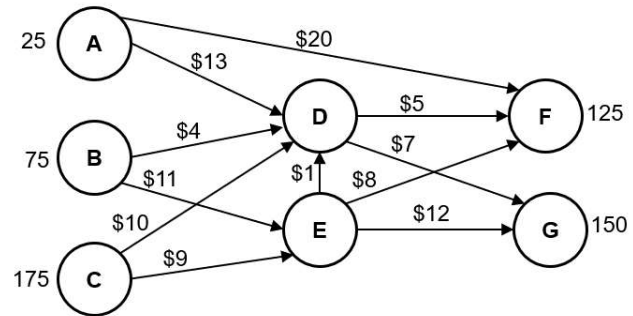
	Unit Shipping Cost			Unit
	Warehouse 1	Warehouse 2	Warehouse 3	Production Cost
Plant A	\$22	\$14	\$30	\$600
Plant B	\$16	\$20	\$24	\$625
Monthly Demand	80	60	80	

☐ True

☒ False

2

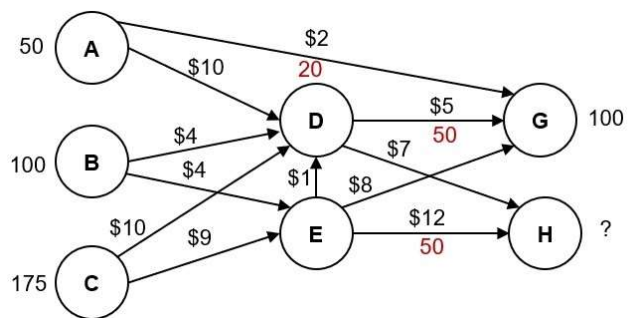
What is the correct constraint formulation for node D?
(Assume x_{ij} is the flow from node i to node j) (2 Points)



- ☐ $x_{AD} + x_{AF} = 25$
- ☐ $x_{BD} + x_{DF} = 0$
- ☐ $13x_{AD} + 4x_{BD} + 10x_{CD} = 100$
- ☒ $x_{AD} + x_{BD} + x_{CD} + x_{ED} = x_{DF} + x_{DG}$
- ☐ $13x_{AD} + 4x_{BD} + 10x_{CD} + x_{ED} = 5x_{DF} + 7x_{DG}$

3

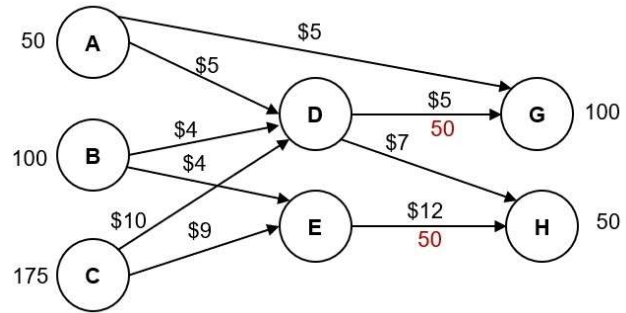
This is a balanced problem. How much demand should node H contain? (2 Points)



225

4

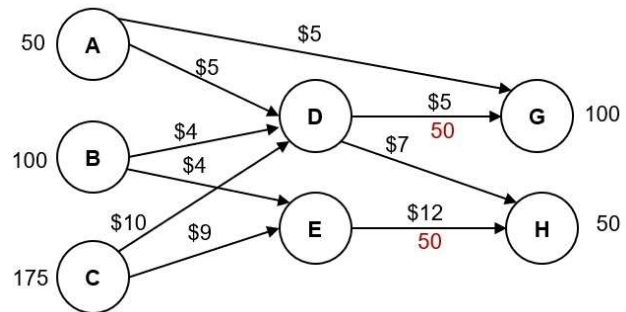
How many constraints does the linear program formulation have for the following capacitated min cost network flow problem? (Count each non-negativity constraint separately) (2 Points)



18

5

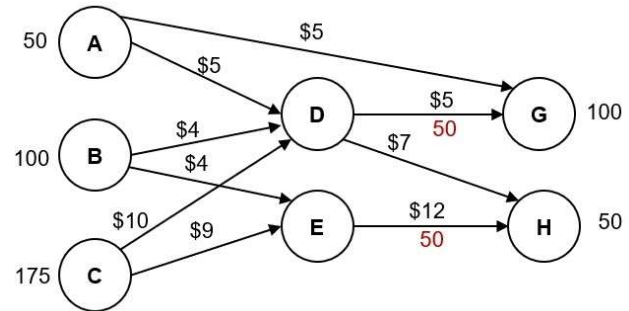
How many decision variables does the linear programming formulation for the following capacitated min cost network flow problem have? (2 Points)



9

6

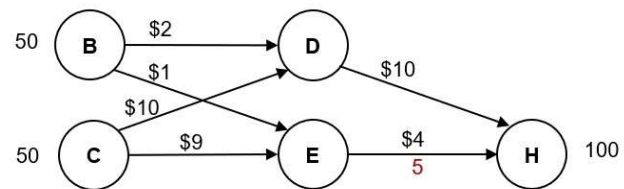
In an optimal solution, what is the net flow for Node E?
(2 Points)



0

7

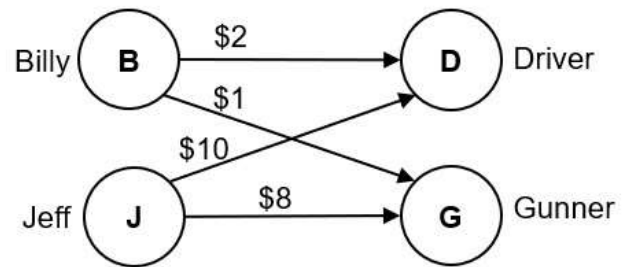
What is the LOWEST possible total cost (in \$) of transporting 10 goods from node B to node H? (2 Points)



\$85

8

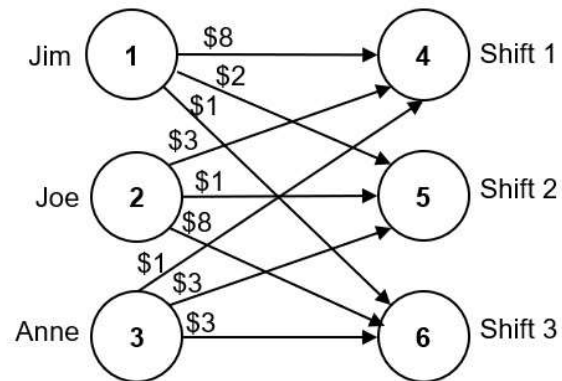
What task does Billy get assigned to in the optimal solution to the following problem? Assume we want to minimize the cost. (2 Points)



- ☒ Driver
- ☐ Gunner

9

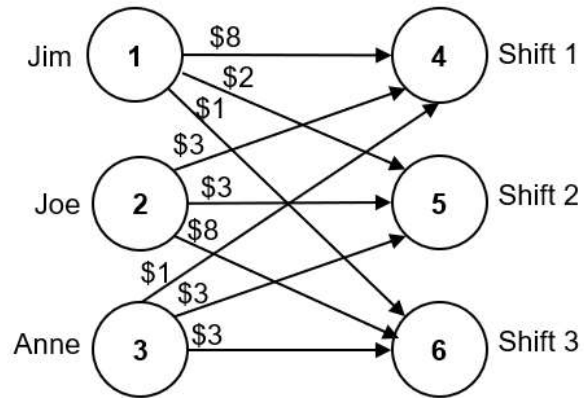
What is the constraint for Anne in this assignment problem? Assume x_{ij} is the assignment of person i to shift j . (2 Points)



- ☐ $x_{34} + x_{35} + x_{36} = 3$
- ☐ $1x_{34} + 3x_{35} + 3x_{36} = 1$
- ☐ $x_{34} + x_{35} + x_{36} = x_{14} + x_{24} + x_{34}$
- ☐ $x_{BD} + x_{DF} = 0$
- ☒ $x_{34} + x_{35} + x_{36} = 1$

10

You are told that in the optimal solution of this minimum cost assignment problem, Jim is assigned to Shift 3, and Joe is NOT assigned to Shift 1. What is the final objective function value? (2 Points)



\$5

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