Answer on Question #62966 -Economics - Microeconomics

Low-skilled workers operate in a competitive market. The labor supply is QS = 10W (where W is the Price of labor measured by the hourly wage) and the demand for labor is QD = 240 – 20W. Q measures the quantity of labor employed (in thousands of hours).
a. Find the equilibrium wage (W) and quantity (Q) of low-skilled labor workers in equilibrium.
b. If the government passes a minimum wage of $10 per hour, what will be the new quantity of labor (Q) demanded? Comparing labor demand and supply at the minimum price, will there be a shortage or surplus of labor? How large?
c. Calculate the deadweight loss of this price floor.
d. By comparing the producers' surplus before and after the minimum wage is introduced, how much better off are low-skilled workers in this case? How much worse off are employers?

Answer.

a) Find the equilibrium wage (W) and quantity (Q) of low-skilled labor workers in equilibrium from equation:

$$QS = QD$$
$$10W = 240 - 20W$$
$$30W = 240$$
$$W = \$8$$
$$Q = 80$$

b) If the government passes a minimum wage of $10 per hour, the new quantity of labor (Q) demanded is
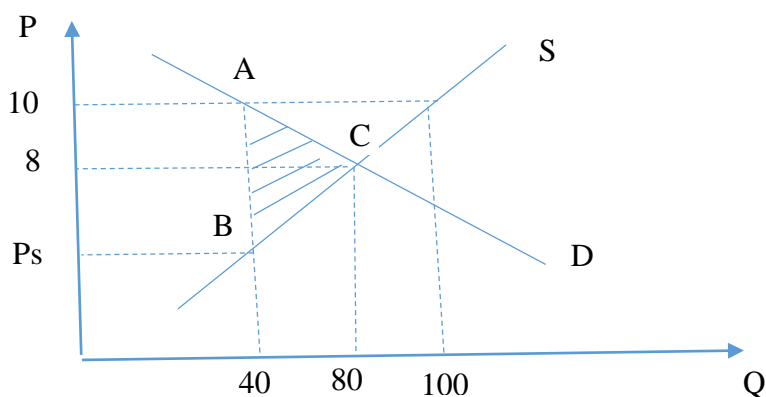
$$QD = 240 - 20 \times 10 = 40$$

Supply is

$$QS = 10 \times 10 = 100$$

Then, there is surplus of labor:

$$QS - QD = 100 - 40 = 60$$

c) Calculate the deadweight loss of this price floor, using the graph:

Deadweight loss is calculated as the area of triangle ABC.
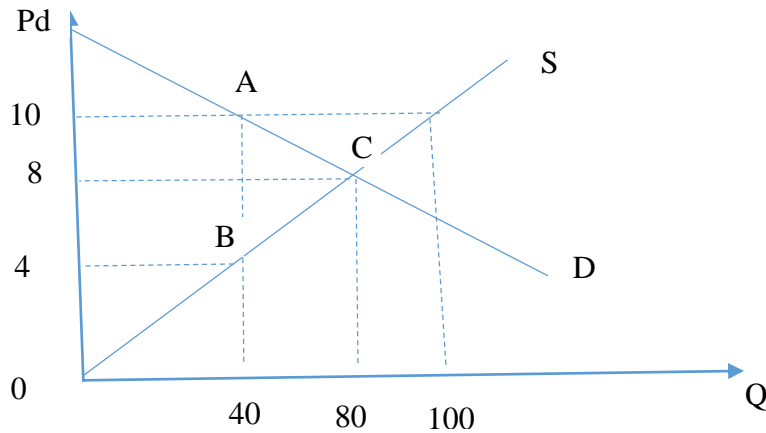First find Ps from the equation:

$$QS = 10 \times W = 40$$
$$W(Ps) = 4$$

So, the area of triangle ABC is

$$Dwl = \frac{1}{2} \times (80 - 40) \times (10 - 4) = 120$$

d) Producer surplus before the minimum wage is an area of triangle (0;8;C):

$$\frac{1}{2} \times 80 \times 8 = 320$$

Producer surplus after the minimum wage is an area of (10; A; B; 0)

$$40 \times (10 - 4) + \frac{1}{2} \times 4 \times 40 = 240 + 80 = 320$$

So, low-skilled workers in this case didn't win anything, their surplus didn't change.

Consumer (employers) surplus before the minimum wage is an area of (Pd;8;C).
Find Pd from equation

$$QD = 240 - 20 \times W = 0$$
$$Pd = 12$$

Consumer (employers) surplus before the minimum wage is

$$\frac{1}{2} \times (12 - 8) \times 80 = 160$$

Consumer (employers) surplus after the minimum wage is the area (Pd;10;A):

$$\frac{1}{2} \times (12 - 10) \times 40 = 40$$

So, employers lost 160-40=120.

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