35. Incorrect. The answer is false not true. Notice in the above diagram that we are in the peak switching case and so should not charge ck+co in peak period and co in the offpeak period. We can check that this is peak switching case from the equations as well. First invert peak and off-peak demand to get:

$P_{pk} = 16 - 2Q_{pk}$

$P_{opk} = 10 - (5/3)Q_{opk}$

Set $P_{pk} = ck+co$ or $16 - 2Q_{pk} = 6 + 1 \rightarrow 2Q_{pk} = 16-7 \rightarrow Q_{pk} = 4.5$

Set $P_{opk} = co \rightarrow 10 - (5/3)Q_{opk}=1 \rightarrow (5/3)Q_{opk}=10-1 \rightarrow Q_{opk} = 5.4$

In the peak shifting case, we are able to lower price for peakers and raise price to off-peakers to get capital used continuously in each period. To figure out the optimal level of capital stock, we need to look at the marginal benefits and marginal costs of running each unit of capital. Take the first unit of capital. From the inverse demand curve, we can see that

the peak market would be willing to pay: $P_{pk} = 16 - 2Q_{pk} = 16 - 2*1 = 14$

the off-peak market would be willing to pay: $P_{opk} = 10 - (5/3)Q_{opk} = 10 - (5/3)*1 = 8\ 1/3$

Thus benefits for running this unit in peak and off -peak are 14 + 8 1/3 = 22 1/3

Similarly for the second unit of capital:

the peak market would be willing to pay: $P_{pk} = 16 - 2Q_{pk} = 16 - 2*2 = 12$

the off-peak market would be willing to pay: $P_{opk} = 10 - (5/3)Q_{opk} = 10 - (5/3)*2 = 6\ 2/3$ and

benefits peak and off peak are 12 + 6 2/3 = 18 2/3

For the continuous case, we can get the whole marginal benefit function by horizontally summing both peak and off-peak until off-peak demand becomes zero at Q = 6. Thus for any given level of Q between 0 and 6 with $Q_{pk} = Q_{opk}$, add the price the two market or the vertical sum is

$P_{pk} = 16 - 2Q_{pk}$

$\underline{+P_{opk} = 10 - (5/3)Q_{opk}}$

$P_{pk} + P_{opk} = 26 - 11/3Q$

Thus, the marginal benefit curve is $26 - (11/3)Q$ from $0<Q<6$. Thereafter, the marginal benefit curve becomes the curve from the peak market. We can see this in the figure below. To choose optimal Q* we also need the marginal cost of purchasing and running each unit of capital in both the peak and off-peak period. In this simple model, the cost of purchase is ck, the cost of running during peak is co and the cost of running during off-peak is also co so total marginal cost is ck + 2op.

Find the Q* where marginal benefit equals marginal cost:

$$26 - (11/3)Q^* = 6 + 2(1) \rightarrow (11/3)Q^*=18 \rightarrow Q^* = 4.909$$

To calculate the price to charge in each market to make quantity = 4.909, go back to inverse demands to find the solution as follows:

$$P_{pk} = 16 - 2Q_{pk} = 16 - 2*4.909 = 6.182$$

$$P_{opk} = 10 - (5/3)Q_{opk} = 10 - (5/3)4.909 = 1.818$$