Problem 1

The student should analyze the problem using the tools reviewed in Lecture 9.

a) The import demand curve: slide 4, export supply curve: slide 6, world market prices determined on slide 7.

b) Domestic prices increase (slide 8), consumption falls and production increases (slide 8)

c) Consumer loss, producer gain and government revenue: slide 12. If there is no terms of trade effect, then the area e is zero, and the net welfare change is unambiguously negative.

d) A dynamic model might yield additional insights. E.g. in the short run, capacity constraints (bottlenecks in production and transportation) might be problem, especially if a single country is the only producer of PPE. Encouraging production in several countries might alleviate these concerns.

Problem 2

An export tax is like a negative export subsidy (Lecture slides 9, p15).

It increases the PPE price in Norway and decreases it in ROW.

ROW: Loss for producers, gain for consumers, gain for government. The net effect might be positive because of better terms of trade.

Norway: Gain for producers, loss for consumers, no income for government. The net effect is always negative because of worse terms of trade.

Problem 3

a) Short run: Mixed specific factors model. The pMPL curve for PPE shifts out. This raises nominal wages. But the increase in nominal wages is less than the PPE price increase. So purchasing power in terms of PPE has decreased, but purchasing power in terms of the other good has increased (Lecture slides 4, p12-16).

b) Long run: Hecksher-Ohlin model. The student should explain the Stolper Samuelson theorem (Lecture slides 5, p22-23). The real wage is increasing because a higher wage/rental ratio is lowering the L/K ratio in both sectors. This increases MPL and therefore the real wage.

c) The long-run response is different because capital is reallocated to the PPE sector. The expanding PPE sector requires relatively more labor, which pushes up labor demand.

Problem 4

a) The production function can be rewritten as $y = Ak^{\alpha}$.

Using the hat algebra notation, this becomes $\hat{y} = \hat{A} + \alpha\hat{k}$, or $\hat{A} = \hat{y} - \alpha\hat{k}$. This yields $\hat{A} = 0$ in 2021-2026 and $\hat{A} = -3/2$ in the second period. Hence,

there is no productivity growth in the first period, and strongly negative growth in the second period.

b) $\hat{A} = \hat{y} - \alpha\hat{k} - (1-\alpha)\,\hat{h}$. Not accounting for human capital is only a problem if h is chaning over the 2021-2031 period. If h is increasing, the $\hat{A}$ calculated in a) will be too big.