

**I (4,5 values)**

Describe 3 of the following concepts:

- i. The Solow residual.
- ii. Government failures.
- iii. Public good.
- iv. Perfect technological diffusion.
- v. Conditional Convergence.

**II (11,5 values)**

In Newland, the production function is given by:  $Y_t = A_t K_t^{1/3} N^{2/3}$ , where  $A_t$  describes the technology and  $N$  is the number of workers, assumed constant. In this economy,  $A = 10$ ,  $s = 25\%$ ,  $n = 0$  and  $\delta = 2\%$ .

A. Consider that  $A_t = Ae^{0,02t}$

1. Describe the model and write down the fundamental dynamic equation of the K/L ratio, where L is labour in efficiency units.
2. Find out the equilibrium values of K/L, Y/L and K/Y. Describe the equilibrium in a graph and discuss its stability.
3. What happens to wages and the interest rate in this model? Are these findings consistent with the empirical evidence?
4. Suppose that in this economy the efficiency level falls to  $A = 20$ . Describe short and the long run effects of per capita income (Y/N), the wage rate, the interest rate and the factor income shares in GDP.

B. Assume instead that  $A_t = 0,2 \left( \frac{K}{N} \right)^{\frac{2}{3}}$

5. Explain the theory that fits in this specification.
6. Find out the dynamics of per capita income in this model and represent it in a graph.
7. Compute the interest rate and the capital-income ratio in this model. Are these results consistent with the empirical evidence?
8. Explain why this economy displays a market failure. What could be done to solve this problem?
9. Suppose that in this economy the efficiency level increases to  $A = 0,4$ . Describe the adjustment dynamics of the different variables in the model.
10. Compare the result obtained in 3 with the result obtained in 8 and discuss.

**III (4 values)**

Choose and comment two of the following sentences:

11. "In the Solow model, technological progress *has to be* exogenous".
12. "The AK model may be interpreted as the Solow model in the short run".
13. "Transpiration responds to inspiration"
14. "Countries with inefficient financial systems are more likely to tolerate bad policies than countries where financial markets are efficient"