Development Economics 2022 Exercise set

1) Romer's (1986) model: Imagine firms (indexed by j∈ $[0,1]$) have acccess
to the same production function:

$Y_j = K^{1-\alpha}K_j^{\alpha}L_j^{1-\alpha}$ K is average capital i.e K=$\int_0^1 K_j$.Assume L=$\int_0^1 L_j$ .Assume
all firms are identical.

a)Calculate the profit max conditions for each firm. Will profits be positive,
negative or zero?

b)Calculate the market clearing conditions for the labour and the capital
market.

c)State if any efficiency condition will be violated and prove the statement.

2) Golden Rule: Start from the Solow Model seen in the slides and in class
(non population growth, no technical progress) . What is the level of s that
allows the economy to max consumption in steady state?

3) Consider the following CES production function:
Y=$[\beta L^{-\rho} + (1-\beta)K^{-\rho}]^{-\frac{1}{\rho}}$,$0 < \beta < 1, \rho > -1$

a) Show that the function has CRS

b) Calculate the marginal productivity of capital (MPK).

c) What happens to the MPK when K goes to infinity?
d) Given this production function can we be sure that a ss. will be reached
in the Solow model? Motivate your answer.