

M.A. Examination, 2016
(Semester – III)
Economics
Course: X (Core)
(Quantitative Methods)

Time: Three Hours

Full Marks: 40

Questions are of value as indicated in the margin

Answer **Question No. 1** and **any three** from the rest of the following questions.

1. Consider a version of Solow model with the standard assumptions: constant population growth rate, $\frac{L(t)}{L(t)} = n > 0$; and the constant saving rate, $s(t) = sY(t)$, $s \in (0,1)$. The only difference with the standard Solow model is that the production function, $Y(t) = F(K(t), L(t))$, satisfies the property of diminishing returns to scale.
 - a) Write down the time path of labour, $L(t)$.
 - b) Derive the intensive form from the production function $y(t) = f(k(t))$, where $y(t) = \frac{Y(t)}{L(t)}$ and $k(t) = \frac{K(t)}{L(t)}$.
 - c) Using the time path of, $L(t)$, and the intensive form production function, $y(t) = f(k(t))$, derive the expression for the capital accumulation equation, $\frac{\dot{k}(t)}{k(t)}$.
 - d) Explain the possibility of the existence of a steady-state equilibrium for this formulation of the Solow model. 1+2+3+4

 2. Draw the phase diagram and analyse the nature of stability of steady state growth equilibrium in the following two sector dynamic model, given by\ $\dot{k}_1 = 12 - k_1 - k_2$; and $\dot{k}_2 = \sqrt{k_1} - k_2$
Here \dot{k}_1
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