

## ENTRANCE EXAMINATION, 2018

M.Phil/Ph.D

## INTERNATIONAL TRADE AND DEVELOPMENT

[ Field of Study Code : ITDP (106) ]

Time Allowed : 3 hours

Maximum Marks : 80

Attempt **any two** out of the **three** questions given in Part A. In addition, also attempt **any three** out of the **four** questions given in Part B, i.e., a total of **five** questions need to be attempted **two** from Part—A and **three** from Part—B.

All the Parts of the chosen questions should be answered.

## PART—A

1. (a) State the properties of the indirect utility function that is derived from income-constrained maximization of a direct utility function. 4

(b) Formally prove any three of them. 4×3=12

2. Consider the system of linear equations

$$3x + 2y + 2az = -13$$

$$x + 2y + az = -5$$

$$5x + 2ay - 3z = -18$$

where  $a \in R$  is a constant.

(a) Using elementary row transformation, reduce the system of equations into its row echelon form and show each step of the transformations that you performed. 8

(b) Based on your answer in part (a) above, classify the solution of the system of equations according to the values of  $a$  i.e., under what conditions on the value of  $a$  will the system have a unique solution, infinite solutions or no solution. 4

- (c) Solve the above linear system for the values of  $a$  for which the system has infinitely many solutions. How many parameters are needed to describe the solution? 4

3. Suppose that  $X$  and  $Y$  are two random variables having the following joint probability density function (pdf) :

$$f(x, y) = \begin{cases} x+y; & 0 < x < 1, \quad 0 < y < 1 \\ 0; & \text{otherwise} \end{cases}$$

- (a) Derive the conditional mean and conditional variance of  $Y$ , given  $X = x$ . 8
- (b) Compute the correlation coefficient between  $X$  and  $Y$ . 8

### PART—B

4. Suppose the Phillips curve is given by  $\pi_t = \pi_t^e + 0.2 - 5u_t$ , where  $\pi_t^e = \theta\pi_{t-1}$ .
- (a) What is the natural rate of unemployment in this economy? 4
- (b) First, assume that  $\theta = 0$ . What does that mean? Suppose that the government decides to lower unemployment to 3% and keep it there forever. What is the rate of inflation for  $t = 100$ ? Is this realistic? Why? 6
- (c) Next, assume that only for the first three periods ( $t = 1, t = 2$  and  $t = 3$ ) people form their expectations using  $\theta = 0$ . After the third period, from  $t = 4$  on, they start using  $\theta = 1$  forever. Also, the government still wants to keep unemployment at 3%. What is the rate of inflation for  $t = 4, 5$  and  $6$ ? What is the expected rate of inflation for  $t = 4, 5$  and  $6$ ? Is this setup more realistic? Why? 6
5. Happyland is a dual economy and the main occupations are agriculture and garment manufacturing. The economy also has high land inequality. Assume that the market for agricultural labour in Happyland functions according to the nutritional efficiency wage model. Is it possible that increased demand for agricultural labour may have little impact on the earnings of individual workers in that sector? Would a low or moderate inequality of landholdings slow down the pace of migration from agriculture to manufacturing? 16
6. (a) Two countries  $A$  and  $B$  are engaged in trade of two commodities  $X$  and  $Y$ , where  $X$  is labour-intensive and  $Y$  is capital-intensive. In this  $2 \times 2 \times 2$  world, country  $B$  imposes a 20% import tariff on commodity  $X$ , and the world relative price of commodity  $X$  falls from 1 to 0.8. What is the impact of the import tariff on the terms of trade of country  $B$ ? Examine the effect of the import tariff on the domestic relative price of  $X$  and wage rate in country  $B$ . 2+6=8

- (b) Consider the Rybczynski theorem in the context of immobile capital and mobile labour in an economy producing two commodities  $X$  and  $Y$  ( $X$  is labour-intensive and  $Y$  is capital-intensive). What is the effect of an increase in labour endowment on the output of  $X$  and  $Y$ , wage rate, and rental? 8

INTERFACCE EXAMINATION, 2018

7. (a) Explain the shape of the long-run supply curve according to the Malthusian theory of population. 4
- (b) Assuming this long-run labour supply function, the process of economic growth driven by capital accumulation in the modern industrial sector, as envisaged by David Ricardo, would ultimately come to a halt as the economy hits the Ricardo-Malthus trap. Explain this trap. 4
- (c) Explain Ricardo's rationale for advocating the repeal of the Corn Law to overcome this trap. 4
- (d) Would the same policy of liberalization of grain imports work for the present-day developing economies when they face the 'trap'? 4

Attempt any two out of the three questions given in Part A. In addition, also attempt any three out of the four questions given in Part B, i.e., a total of five questions need to be attempted ★★ from Part-A and three from Part-B.

All the Parts of the chosen questions should be answered.

PART-A

- (a) State the properties of the indirect utility function that is derived from money-constrained maximization of a direct utility function. 4
- (b) Formally prove any three of them. 4×3=12

2. Consider the system of linear equations

$$3x + 2y + 2z = -17$$

$$4x + 3y + 2z = 5$$

$$5x + 2ay - 3z = -18$$

where  $a$  is a constant

- (i) Use elementary row transformation, reduce the system of equations into its row echelon form and show each step of the transformations that you perform. 8
- (ii) Based on your answer in part (i) above, discuss the solution of the system of equations according to the value of  $a$ , under what conditions on the value of  $a$  will the system have a unique solution, infinite solutions or no solution. 4