

**ENTRANCE EXAMINATION, 2013**

M.Phil./Ph.D.

**INTERNATIONAL TRADE AND DEVELOPMENT**

[ Field of Study Code : ITDP (106) ]

*Time Allowed* : 3 hours

*Maximum Marks* : 70

Answer Question No. **1** and *any three* other questions. All the parts of the chosen questions should be answered

1. (a) Consider the problem of maximizing the quadratic form  $X'AX$  subject to the constraint  $X'X = 1$ . Show that the optimal  $X$  is the eigenvector corresponding to the largest eigenvalue of  $X$ . 5
- (b) Show that the equation  $17x^7 - 19x^5 = 1$  has exactly one solution in  $(-1, 0)$ . 5
2. Consider the Keynesian cross model of a closed economy described by the equations

$$Y = C + I + G,$$

$$C = C_0 + c(Y - T), \quad 0 < c < 1,$$

where  $Y$ ,  $C$ ,  $I$ ,  $G$  and  $T$  are respectively, output, consumption, investment, government consumption, and taxes.  $C_0$  represents the exogenous part of consumption, and  $c$  is the marginal propensity to consume. Assume prices to be fixed and  $I$ ,  $G$  and  $T$  to be given exogenously.

- (a) Derive the *savings equation* and the expression for the equilibrium condition involving the savings equation. 5
- (b) Demonstrate the so-called *paradox of thrift* by computing the effects on output, savings and consumption of a decrease in  $C_0$ . Why do we call this phenomenon a paradox of thrift? 8
- (c) Compute the output multiplier with respect to government consumption under the assumption that the government finances its additional spending by raising the tax (i.e.,  $dT = dG$ ). Explain the intuition behind this balanced-budget multiplier. 7

3. (a) The demand for notebooks is given by

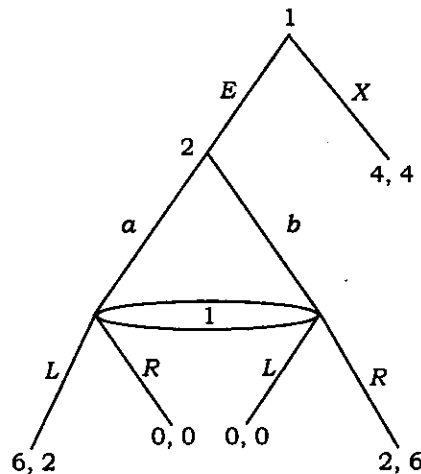
$$Q_d = 150000 - 15000 p,$$

where  $p$  is the market price. The market for notebooks is perfectly competitive. Each firm has access to the same technology and its total cost is given by

$$C(q) = \frac{q^2}{2000} + 500,$$

where  $q$  is the quantity supplied by an individual firm. There are initially 60 firms supplying notebooks.

- (i) What is the market supply curve? 3
- (ii) What are the short-run equilibrium price and quantity in the market? How many notebooks will each individual firm supply? 3
- (iii) What are the market price and quantity in the long-run equilibrium? How many firms are there in the long run? 4
- (b) In the following extensive form game between Player 1 and Player 2—
- (i) find all the pure-strategy Nash equilibria;
- (ii) find all the pure-strategy sub-game perfect Nash equilibria (SPNE);
- (iii) explain why all the Nash equilibria may not be SPNE. 3+4+3=10



4. (a) What are Transnational Corporations? It is argued that these entities cannot exist without some market imperfections. In this light, discuss some of the main imperfections listed in the literature. 10
- (b) It is argued that the formation of the North American Free Trade Agreement (NAFTA) had an adverse impact on both India and world welfare. Discuss in the context of the theory of customs union. 10

5. (a) The random variables  $x$  and  $y$  have the following joint probability density function :

$$f(x, y) = x + y, \quad 0 < x < 1, \quad 0 < y < 1 \\ 0, \quad \text{elsewhere.}$$

Find the regression of  $y$  on  $x$ . Clearly show your steps in the derivation. 8

- (b) Consider the true regression model to be given as

$$y_t = \beta_0 + \beta_1 x_{1t} + \beta_2 x_{2t} + u_t,$$

where  $E(u_t) = 0$ ,  $E(u_t^2) = \sigma^2 \forall t$ ,  $E(x_{it}, u_t) = 0$ ,  $i = 1, 2$  and  $t = 1, 2, \dots, n$ .

However, the model is misspecified during the estimation and  $x_2$  is omitted. Examine the properties of *unbiasedness* and *consistency* of the OLS estimate of  $\beta_1$  in this misspecified model. 8+4=12

6. Write short notes on the following : 10+10=20

- (a) Ricardian trap  
(b) Low-level equilibrium trap

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