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JNUEE: Question Papers (2010-2012) Rs.10/-

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ENTRANCE EXAMINATION, 2012

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

1. *(a)* Consider the function $U\alpha(x) = \frac{x^{\alpha}-1}{\alpha}$; $0 < \alpha \le 1$ and $0 \le x < \infty$. Show that on R_{++} (i.e., for any $x > 0$), $\lim_{\alpha \to 0} U\alpha(x) = \ln x$. Further show that $U\alpha(x)$ is concave and monotone increasing in x. 5

(b) The probability density function of a random variable x is given as follows :

$$f(x) = Ae^{-(1/5)x}, \quad \text{for } x > 0$$

Obtain the value of A and find the probability of $x > 10$. 5

2. In the home country, demand for X is given by

$$q_d^h = 100 - P_h, \quad (0 < P_h < 100)$$

and in the rest of the world by

$$q_d^f = 200 - 2P_f, \quad (0 < P_f < 100)$$

P_h and P_f are the home and foreign prices of X respectively, and both are measured in terms of a common numeraire. The industry is everywhere competitive with the home supply function given by

$$q_s^h = 2P_h - 50, \quad (P_h > 25)$$

and for the rest of the world

$$q_s^f = 10P_f - 40, \quad (P_f > 4)$$

Shipping a unit of the good X from one country to the other costs 5.

(a) Find the domestic and foreign price of the good under free trade. 5

(b) Derive the transport demand equation. Hence find the level of transport which will eliminate trade. Evaluate the elasticity of the transport demand with respect to its price when transport costs are 10. (*Hint* : Work out the import demand function.) 15

3. "The infant industry argument for protection can never be justified on the basis of developments in trade theory." Discuss, theoretically, using models of trade that you are familiar with. 20

4. "Urban wage may not fall despite the evidence of involuntary unemployment." Explain this proposition using Stiglitz's turnover model. 20

5. (a) Define a stochastic process. When is a stochastic process called strictly stationary and when is it called weakly stationary? Show that for a Gaussian process, weak stationarity implies strict stationarity. 10

(b) An econometrician was given the task of investigating how public expenditure in welfare schemes and per capita GDP affect the human development of an economy. The econometrician sets up the following regression model for the study :

$$HDI_i = \ln(PE_i) + \ln(PGDP_i) + \varepsilon_i$$

where, HDI_i = Human development index for country i

PE_i = Public expenditure on welfare schemes in country i

$PGDP_i$ = Per capita GDP of country i

ε_i = Disturbance term following classical linear regression model assumptions

Comment on whether the above model is a valid one. If so, explain why. If not, explain why and suggest an alternative model. 10

6. Consider the following Keynesian model for a closed economy :

$$Y = C + I + G$$
$$C = C_0 + c(Y - T), \; 0 < c < 1$$
$$I = I_0 + \dot{Z}$$
$$\dot{Y} = -\gamma \dot{Z}$$

where Y is output, C is consumption, I is actual investment, G is government consumption, T is taxes, I_0 is planned investment and Z is the stock of inventories. A variable with dot denotes its rate of change over time, that is, $\dot{Z} = \frac{dZ}{dt}$ and $\dot{Y} = \frac{dY}{dt}$. C_0 and I_0 are exogenous parts of consumption and investment respectively, and c denotes the marginal propensity to consume. Assume that prices are fixed and that G and T are both exogenous.

(a) Interpret the equations of the model. 5

(b) Show that the model is stable. Illustrate your answer graphically by using a phase diagram for the model. 7

(c) Show the effects over time on output, consumption, actual investment and inventories of a tax-financed increase in government consumption ($dT = dG$). 8

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ENTRANCE EXAMINATION, 2011

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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

1. *(a)* Solve : 5

$$\frac{dy}{dt}+2y=\frac{3}{y}$$

(b) On a line segment, three points X, Y, Z are taken at random. What is the probability that Z lies between X and Y? 5

2. Let the production function be given by $f(z_1, z_2)=\sqrt{z_1+z_2}$, where z_1 and z_2 are inputs 1 and 2 used to produce output. Let p, w_1, w_2 represent prices of output and the two inputs respectively. Derive the profit function and supply function. 20

3. *(a)* The economy of Ruritania is labour abundant and the economy of Salvia is capital abundant. If the two economies are opened up to trade, what are the minimum necessary assumptions required for trade to take place according to the Heckscher-Ohlin theory? Suppose trade takes place according to this theory, then show with diagrams when factor prices are equalised by trade. 10

(b) Suppose Ruritania imposes a tariff on its imports from Salvia. Examine the effects of tariff on the production and distribution of income in Ruritania. 5

(c) What do you understand by the price-specie flow mechanism under the Gold Standard? 5

4\. (a) In what sense is the Harris-Todaro equilibrium suboptimum? 10

(b) Show that an optimum wage subsidy uniformly given to both the rural and the urban sectors can shift the economy towards its optimum position. 5

(c) Without knowing the precise value of this optimum subsidy, would it be wise to spend as much as possible on a uniform wage subsidy to both sectors? 5

5\. Write short notes on : 10+10=20

(a) Dummy variable trap.

(b) Simultaneous equation bias

6\. Consider the Solow model of growth, where output is given by the neoclassical production function

$$Y(t) = \{A(t).L(t)\}^{\alpha}\{K(t)\}^{1-\alpha}, \quad 0 < \alpha < 1$$

where $L(t)$ and $K(t)$ are labour and physical capital at time t and $A(t)$ is the state of technology (which is labour augmenting). The technology grows at rate x, the population at rate n and the stock of capital depreciates at rate δ. There is a constant saving rate s.

(a) Derive the convergence equation, that is, find an expression for the rate of growth of income towards the steady state that depends on the initial income. What is the rate of convergence? 10

(b) Given the expression derived in (a) above, what is the convergence conditional on? 10

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ENTRANCE EXAMINATION, 2010

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.
Analytical precision must be attempted.

1. *(a)* The irritation of carrying a shopping bag always reduces my utility by $\frac{1}{2}$ a unit. If I actually go shopping, the shopkeeper refuses to give me a bag, I cannot buy one and the process of getting a bag eventually reduces my utility by 3 units. If, however, I carry a bag then shopping reduces my utility by only 1 unit. The probability that I will go shopping is $\frac{1}{2}$. Show that if I maximise my expected utility, I should always carry a bag. 5

   (b) Using monotonicity and boundedness, show that the following functions are convergent : 5

   (i) $a_n = \frac{1}{n+1} + \frac{1}{n+2} + \cdots + \frac{1}{n+n}$

   (ii) $a_n = 1 + \frac{1}{1!} + \frac{1}{2!} + \cdots + \frac{1}{(n-1)!}$

6. [illegible] model where the production function takes the form

$$F[K(t),\ A(t).L(t)] = K(t)^{\alpha}[A(t).L(t)]^{1-\alpha}$$

$0 < \alpha < 1$, K and L are capital and labor respectively, t is time and α, the technology parameter. Further, suppose S is the exogenous savings rate, n, the growth rate of labor force, δ, the rate of depreciation of capital stock and g is the rate of change of knowledge or labor effectiveness.

(a) Find the expressions for the variables k, y and c in steady state as functions of the parameters of the model where k, y and c are the capital, output and consumption per unit of labor.

(b) What is the golden rule value of k?

(c) What savings rate yields the golden rule capital stock? 20

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