LNMIIT
The LNM Institute of Information Technology

The LNM Institute of Information Technology
Department: Humanities and Social Sciences
Applied Economics (4161)
Exam Type: Mid Term

Time: 180 minutes **Date:** 04/10/2019 **Max. Marks:** 50 (Weight: 50%)

General Instructions:

- Questions are self-explanatory. Read the questions well!
- Any answer that does not follow the instruction mentioned in the respective question will not be awarded marks.
- **NO PART MARKING**

Q. 1 Joe and Rebecca are two sellers of bread in a Hamlet in the Ratnagiri district of Maharashtra. The market demand function is $Q^d = 10000 - 100P$; where P is the price of per loaf of bread and Q^d is the number of loaves demanded. Marginal cost of bread is Rs. 40 per loaf. *Competition* in the market is described by the *Cournot* Model. What are Joe and Rebecca's *Nash equilibrium outputs*? What is the resulting *Prices*? Draw the *reaction functions* for Joe and Rebecca and point out the Nash equilibrium output level. [2+ 1 + 2 = 5]

Q. 2 The market demand function for Juicers is $Q^d = 10000 - 100P$ where P is the price of a Juicer and Q^d is the number of Juicers demanded. Two companies Bajaj Electricals and Reconnect (of the Reliance Industries Ltd.) are two sellers producing this currently. The marginal cost is Rs. 40 per Juicer. However, it is Bajaj Electricals that has entered the market first and chooses its output before Reconnect. Calculate the two companies optimal level of output. Find out which among the two firms has a larger profit. [3 + 2 = 5]

Q.3 There are two mobile network companies (denoted by 1 and 2) operating in a city $p = 8 - (q_1 + q_2)$. Their objective is to maximize profit. Each has a total cost function given as $C_i = 4q_i$; $i = 1,2$. Show *mathematically*, why the firm's *wouldn't* cooperate. How can a cooperation be reached among them. [4 + 1 =5]

Q.4 (a) Arnab and Pranoy are playing the game Rock, Paper and Scissors. In each round the players choose one of three items (i.e., either of Rock, Paper and Scissors) independently from each other. They show the items with their hands: a rock, scissors or paper. The winner is determined by the following rules: the rock beats the scissors, the scissors beat the paper and the paper beats the rock. If the players choose the same item, the round finishes with a draw and get zero. Player get +1 on winning and – 1 for losing for their respective strategies. Represent the game in normal form clearly mentioning the strategies. [2]

(b) Consider the following normal form game and find out the mixed-strategy Nash equilibrium. [3]

		Player 2	
		L	R
Player 1	T	(2, 1)	(0,2)
	B	(1,2)	(3,0)

Q. 5 Explain *mathematically* why two producers selling *homogenous* goods, having the *same* cost structures and *competing* in prices are likely to charge a price which equals their marginal cost of production. [3]

Q.6 What are the differences between *grouped*, *proportionate* and *perceived* demand curves. Explain *graphically* why it is unlikely the firm who sells inferior quality products to charge the consumers a higher price of the product. [2+2 = 4]

Q.7 (a) In the Keynesian cross, assume the consumption function is given by $C = 200 + 0.75(Y - T)$. Planned investment is 100; government purchases and taxes are both 100. Based on this information answer the following: [1+1 = 2]

i. What is the equilibrium level of income?
ii. What level of government purchases is needed to achieve an annual income of 1600?

(b) Using the concept of Keynesian cross derive the government expenditure multiplier. Explain the economic logic behind it. [3]

Q.8 Why is the slope of the Aggregate Demand curve *negative*? [4]

Q.9 Why does an increase in interest rate in an economy reduces the income or the output level. Explain using diagram and prove it mathematically. [5]

Q. 10 Looking at the current situation of the economy, the Finance Minister of Djibouti has increased the tax rate. Using the IS-LM framework, show the following: [1×3 = 3]

i. The central bank of Djibouti aims to hold the money supply constant
ii. The central bank of Djibouti aims to hold the interest rate constant
iii. The central bank of Djibouti aims to prevent the tax increase from lowering income

Q.11 Calculate the elasticity of substitution for the production function $Q = \left[K^{\rho} + L^{\rho}\right]^{\frac{\gamma}{\rho}}$; $\gamma > 0$ and $0 < \rho \leq 1$; where Q is the output, K and L of inputs. [3]

Q. 12 Explain the different ways through which a monopoly can be regulated. [3]

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