

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

FIRST SEMESTER 2022-2023

Mid Semester Examination (Regular)

(Open Book)

Course No. : **ECON F311**
 Course Title : **International Economics**
 Date : **05/11/2022**

Max. Marks : **60**
 Weightage : **30%**
 Duration : **90 mints**

Q1. Assume that labor is the only factor of production and is homogenous. Further assume prices equal the cost of production. Given this information, answer the question that follows the table: **[10M]**

	N-1	N-2
Wheat(bushel/labor-hour)	6	1
Cloth (yard/labor-hour)	3	2

- (a) Express P_C relative to P_W for both the N-1 and the N-2 in the absence of trade.
- (b) Express the limits for mutually advantageous trade in terms of P_W/P_C and P_C/P_W .
- (c) Assuming that, the wage rate per labor hour in the N-1 is \$6 and that of N-2 is £1.8, express P_W and P_C in the N-1 in terms of \$ and in the N-2 in terms of £, in the absence of trade.
- (d) Which commodity will the N-1 import and export if the exchange rate is £ 1 = \$ 3. What if £ 1 = \$ 0.50? What if £ 1 = \$ 2? What if £ 1 = \$ 1?

Q2. Suppose that an economy produces and consumes only two goods, X and Y. The economy uses labor as the only input for production. The production function for good X and good Y are given as: $X = \sqrt{L_X}$ and $Y = 2\sqrt{L_Y}$. Assume that maximum labor available in the economy is 200. Again, suppose the nation has the following utility function given as $U = U(X, Y) = \sqrt{XY}$. Given this information, answer the following question: (**Note:** Take good Y along Y axis) **[8M]**

- a) What is the optimal combination of X and Y that will be produced and consumed in isolation?
- b) What is the internal equilibrium relative commodity price in isolation?
- c) Analyze the above situation with the help of suitable graph with proper labels.

Q3. Suppose that the US and Mexico have the following factor endowments given in the table below. Suppose that the production requirements for a unit of steel is 2 machines and 8 workers, and the requirement for a unit of bread is 1 machine and 8 workers. Use the information in the table to answer the question that follows. **[8M]**

	US	Mexico
Capital	40 machines	10 machines
Labor	200 workers	60 workers

- a) State Heckscher Ohlin theorem and do you think it holds true in the above situation. Indicate the criterion on which it does hold or does not hold true.
- b) Suppose that before trade takes place, the US is at a point on its PPF where it produces 20 loaves of bread and 20 units of steel. Once trade becomes possible, the price of a unit of steel is 2 units of bread. In response, the US moves along its PPF to a new point where it is producing 30 units of steel and 10 loaves of bread. Is the country better off? How do you know?
- c) Explain what happens to the returns to capital and labor in each country after trade begins.

Q4. In each of the following situations, with the help of well labeled graph, represent the trade possibility between two nations: Nation 1 and 2, with increasing opportunity costs existing in both the nations. **[8M]**

- a) Two nations have identical tastes and demand preferences but supply conditions between the nations differ.
- b) Two nations have identical supply conditions but tastes and demand preferences between the nations differ.

Q5. Suppose the world is comprised of only 2 nations: Nation 1 and Nation 2. Nation 1's demand and supply for commodity X is $P = 5 - 0.05Q$ and $P = -1 + 0.05Q$ while Nation 2's demand and supply for commodity X is $P = 4 - 0.05Q$ and $P = -2 + 0.05Q$. In the given situation, P represents the price of commodity X in terms of \$. Based on this information, answer the following questions: **[10M]**

- a) Which country has a comparative advantage in the production of commodity X? Substantiate your answer.
- b) Now allow Nation 1 and 2 to trade with each other, at zero transportation cost. What is the volume of trade between these countries and how many units are produced and consumed in each country?
- c) Now suppose the cost of transportation between the two countries is \$0.50 what is the impact of transportation costs on the units of good X being consumed, produced and volume of trade between both the countries?

Q6. Following table gives information for two countries: Singapore and Sri Lanka producing only two goods: cheese and textiles. Assume that cheese (C) is a L - intensive commodity and textile (T) is a K - intensive commodity. Based on the information, answer the question that follows: **[16M]**

Singapore	Quantity of C	15	25	40	60	75	90
	Quantity of T	5	10	20	40	60	90
SriLanka	Quantity of T	20	30	40	60	80	90
	Quantity of C	6.25	12.5	20	37.5	60	90

- a) Sketch on a single graph the Singapore and SriLanka offer curves from the data given above. (Note: Take cheese on the X- axis and textile on the Y-axis mentioning all labels clearly). What is the equilibrium P_C / P_T with trade and the volume of trade?
- b) Starting with the two nation's offer curves from (a) above, show in tabular form what happens if Singapore imposes a 100% tariff on its importable commodity. What is the new volume of trade? What are the new calculated values of the terms of trade of Singapore and SriLanka and identify whether the terms of trade has improved or deteriorated for each of these nation?
- c) Starting with the two nation's offer curves from (a) above, show in tabular form what happens if the SriLanka imposes a 100% tariff on its importable commodity. What is the new volume of trade? What are the new calculated values of the terms of trade of these two countries and identify whether the terms of trade has improved or deteriorated for each of the nation?
- d) Based on (b) and (c) if both the situations are taken together, what is the new volume of trade?

*****END*****

Two countries, Hungary and France, trade apples (A) and bananas (B) in a Ricardian (and or Harberler) trade world. Hungary has 1,200 units of labor available, and requires 3 units of labor to produce one tonne of apples and 2 units of labor to produce one tonne of bananas. France has 800 units of labor available, and requires 5 units of labor to produce one tonne of apples and 1 unit of labor to produce one tonne of bananas.

[10.00]

- A) In autarky, what are the relative price of apples and bananas in the two countries respectively?
- B) Indicate which commodity will Hungary and France export once trade starts and the limits within which mutual advantageous trade can take place between them.
- C) Draw the PPF for both the countries taking apples along the X axis. In autarky, identify the point of consumption assuming that both the nations divide the total units of labour available equally in their respective economy to produce the quantity of apples and bananas.
- D) On the same graph drawn above, if the equilibrium relative commodity price is 2 after trade, show the gains from trade.
- E) Derive the combined supply curve of apple and banana respectively.

Q2. Suppose USA and SriLanka produces and consumes only two goods: Wheat (W) and Cloth (C). Both the economy uses labor as the only input for production. For USA: the production function for good W and good C are given as $W = (L_W)^{1/2}$ and $C = 2 (L_C)^{1/2}$. For SriLanka: the production functions for good W and good C are given as $W=(L_W)^{1/2}$ and $C = \frac{1}{2} (L_C)^{1/2}$. Assume that the maximum labor available in USA and SriLanka are 200 and 100 respectively. Further, suppose that both the nation has the following community's preferences given as $U= U(W, C) = (WC)^{1/2}$. Given this information, now answer the following question: (Note: Take good C along Y axis) [8.00]

- d) What is the range of relative commodity price between which trade will take place between these two nations?
- e) Analyze the above situation with the help of suitable graph with proper labels.

Q3. Consider the market for automobiles (of brand X) for 2 nations: China and Japan. Suppose that China's demand and supply function for X are given as: $P = 70 + Q$ and $P = 170 - Q$, while that of Japan are given as: $P = 10 + Q$ and $P = 110 - Q$. Based on these information, now answer the following questions: [12.00]

- a) Assume that importing nation imposes a quota that limits imports to 50 X, determine the amount that is produced and consumed. Calculate the effect on consumer and producer surplus. Calculate the quota revenue (if the government auctioned off import licenses of \$10 per X), and the total protection cost due to import quota.
- b) Initially assume that the importing country is a small nation and consider an import tariff of 10 per unit of X. What will be the effects on consumer welfare, producer welfare, and government revenue? Does this policy raise national welfare?
- c) Now suppose that the importing nation is not small but large and imports X from the other country. Further again consider a same import tariff as given in (b). What will be the effects on consumer welfare, producer welfare, and government revenue? Does this policy raise national welfare? Substantiate your answer.

Q4. In each of the following situations, with the help of well labeled graph, represent the trade possibility between two nations: Nation1 and 2, with increasing opportunity costs existing in both the nations. [5+5]

- c) Two nations have identical tastes and demand preferences but supply conditions between the nations differ.
- d) Two nations have identical supply conditions but tastes and demand preferences between the nations differ.

Q5. Suppose the world is comprised of only 2 nations: Nation 1 and Nation 2. Nation 1's demand and supply for commodity X is $P = 5 - 0.05Q$ and $P = -1 + 0.05Q$ while Nation 2's demand and supply for commodity X is $P = 4 - 0.05Q$ and $P = -2 + 0.05Q$. In the given situation, P represents the price of commodity X in terms of \$. Based on this information, answer the following questions: **[20]**

- d) Which country has a comparative advantage in the production of commodity X? Substantiate your answer.
- e) Now allow Nation 1 and 2 to trade with each other, at zero transportation cost. What is the volume of trade between these countries and how many units are produced and consumed in each country?
- f) Now suppose the cost of transportation between the two countries is \$0.50 what is the impact of transportation costs on the units of good X being consumed, produced and volume of trade between both the countries?
- g) Assume that the importing country is a small nation (with zero transportation cost) and consider an import tariff of \$0.25 on import of good X. What will be the effects on consumer surplus, producer surplus, and government revenue of the importing nation? Does this policy raise net national welfare? Substantiate your answer.

Q6. Prove that in a two factor model, the factor that is used intensively in the import competing good will always gain when the nation is moving from free trade to protectionism. **[8.00]**

Q7. Following table gives information for two countries: Singapore and Sri Lanka producing only two goods: cheese and textiles. Assume that cheese (C) is a L - intensive commodity and textile (T) is a K - intensive commodity. Based on the information, answer the question that follows: **[10.00]**

Singapore	Quantity of C	15	25	40	60	75	90
	Quantity of T	5	10	20	40	60	90
SriLanka	Quantity of T	20	30	40	60	80	90
	Quantity of C	6.25	12.5	20	37.5	60	90

- e) Sketch on a single graph the Singapore and SriLanka offer curves from the data given above. (Note: Take cheese on the X- axis and textile on the Y-axis mentioning all labels clearly). What is the equilibrium P_c / P_T with trade and the volume of trade?
- f) Starting with the two nation's offer curves from (a) above, show in tabular form what happens if Singapore imposes a 100% tariff on its importable commodity. What is the new volume of trade? What are the new calculated values of the terms of trade of Singapore and Srilanka and identify whether the terms of trade has improved or deteriorated for each of these nation?
- g) Starting with the two nation's offer curves from (a) above, show in tabular form what happens if the SriLanka imposes a 100% tariff on its importable commodity. What is the new volume of trade? What are the new calculated values of the terms of trade of these two countries and identify whether the terms of trade has improved or deteriorated for each of the nation?
- h) Based on (b) and (c) if both the situations are taken together, what is the new volume of trade?

Q8. Srilanka is a small closed economy. Srilanka's domestic supply curve and domestic demand curve for coconuts is given by the following equations where Q is units of coconuts and P is the price per unit of coconuts: (assume coconut is a L-intensive commodity) **[15.00]**

$$P = 100 - (1/20)Q \quad P = (1/60)Q$$

- a) Given the above information, what is the value of consumer surplus and producer surplus in autarky?
- b) Suppose the world price per unit of coconuts is \$10 and Srilanka opens its coconut market to trade, calculate the value of consumer surplus and producer surplus with trade?
- c) Suppose Srilanka implements a specific tariff that results in 600 units of coconuts being imported. Given the imposition of this tariff, what are the partial equilibrium effects from the tariff?
- d) Does this policy raise national welfare? Substantiate your answer.
- e) What is impact of tariff on returns of labor? Substantiate and state the theorem behind it.

Q9. Assume a 2x2x2 model with two nations: N-1 and N-2 having comparative advantage in X and Y respectively using 2 factors of production: labor and capital. Further assume that N-1 is L rich and N-2 is K

rich economy and both the nations are large nations. Graphically demonstrate and clearly state for each of the following cases separately the impact on volume of trade and the terms of trade in both the nations in a general equilibrium analysis: (note: Commodity X measured along X axis) [12.00]

- a) If labor doubles in N-2 only.
- b) If labor doubles in N-1 only.
- c) If capital doubles in N-1 only.
- d) If capital doubles in N-2 only.
- e) If labor doubles in N-1 and capital doubles in N-2
- f) N-2 desire for commodity X increases only

Q10.

Q11. Consider the market for steel for two nations i.e., Nation 1 and Nation 2. These nations demand function for steel takes the form $P = 170 - Q$ and $P = 110 - Q$ and their supply function for steel takes the form $P = 70 + Q$ and $P = 10 + Q$ respectively. Suppose that the importing nation is large and imports steel from the other country. Further again consider an import tariff of 10 per unit of steel. Given this information now answer the following questions: [3.00]

- a) What is the price of steel after the imposition of tariff? How much quantity of steel will the importing country consume, produce and import at this price?
- b) Calculate the change in the importing country consumer surplus due to the tariff-induced price of steel. Calculate the consumption, production, redistribution, and domestic revenue effects. What are the domestic welfare gain / loss of the tariff?
- c) What will be the new world price of the steel that the foreign producers will receive? What impact will it have on the importing country terms of trade and on its welfare? Calculate the terms- of trade effect.
- d) What impact does the tariff have on the overall welfare of the importing country?

Q12. State and explain Rybczynski theorem with the help of **edgeworth box diagram**. [6.00]

Q13. Suppose that India's demand and supply for wheat is $Q = 100 - 20P$ and $Q = 20 + 20P$. Similarly SriLanka's demand and supply for wheat is $Q = 80 - 20P$ and $Q = 40 + 20P$. In the above case, P represents the absolute price of wheat in terms of rupees. [7.00]

- a) Which country has a comparative advantage in the production of wheat? Substantiate your answer.
- b) Now allow Sri Lanka and India to trade with each other, at zero transportation cost. What is the volume of trade between these countries and how many units are produced and consumed in each country?
- c) Now suppose the cost of transporting wheat between the two countries is 0.50 what is the impact of transportation on the units of wheat being consumed, produced and volume of trade between both the countries?
- d) Assume that the importing country is a small nation (with zero transportation cost) and consider an import tariff of 0.25 on wheat imports. What will be the effects on consumer welfare, producer welfare, and government revenue? Does this policy raise national welfare? Substantiate your answer.

Q14.

Q15. Assume that the United States, as a steel-importing nation, is large enough so that changes in the quantity of its imports influence the world price of steel. The U.S. supply and demand functions for steel are given below, along with the overall amount of steel supplied to U.S. consumers by domestic and foreign producers.

U.S. quantity supplied (domestic) is $Q_{SH} = 0.01P - 2$

U.S. combined quantity supplied (domestic + foreign) is $Q_{SH+F} = 0.04P - 4$

U.S. quantity demanded $Q_D = 16 - 0.01P$.

- a) Calculate the equilibrium price with free trade. How much tons of steel will the U.S. consume, produce and import with free trade?
- b) To protect its producers from foreign competition, suppose the U.S. government levies a specific tariff of \$250 per ton on steel imports.
- (i) Show graphically the effect of the tariff on the overall supply curve of steel.
 - (ii) What is the new price of steel after the imposition of tariff? How much tons of steel will the U.S. consume, produce and import at this price?
 - (iii) Calculate the change in U.S. consumer surplus and due to the tariff-induced price of steel. Also calculate the consumption, production, redistribution, and domestic revenue effects. What is the domestic welfare loss / gain of the tariff?
 - (iv) What will be the new price of the imported steel if the United States changes the volume of imports with the tariff? What impact will it have on the U.S's terms of trade and on its welfare? Calculate the terms- of trade effect. What impact does the tariff have on the overall welfare of the United States?

[5.00]

Q16.