2.

**Report Part**

Based on the description of the question, we know that there are two consumers and two goods shown in utilities functions. In economics, the Edgeworth box is a graphical illustration of the trade difficulty encountered by the participants in a two-person, two-good "exchange economy." It enables them to solve and visualize their exchange problem in a straightforward manner. A Pareto efficient allocation is one in which it is impossible to benefit one person without harming another (or, more broadly, someone else). It is important to note that a Pareto efficiency allocation does not always indicate a fair or socially desirable distribution of resources, because the idea makes no claim regarding equality or a society's overall wellbeing.

Contact curve is an economy's collection of Pareto optimal allocations. Every point on this curve optimizes one person's utility given the other, and they are distinguished by the isoquant tangencies.

a) The utilities functions for consumer R and S are given. Quantities for two consumers are defined as well as the endowment. Two parameters has one constraint a+b=1.

An allocation () , having to be greater than zero, will be efficient if and only if the two people’s marginal rates of substitution are equal. Using the marginal utility function of two consumers and two goods, we defined as a function of , which defines an upward–sloping curve in the Edgeworth box. When is 0, the will be 0. Besides, can’t equal to .

Looking at the Edgeworth box, we can see measure R’s consumption from bottom left and S’s from top right. R and S must be no worse off after exchange than at their initial endowment. Endowments will be divided as a result of the exchange in the shaded region above and to the left of point E.

The total amount of products available for consumption remains constant.

R and S have the property of efficient allocation. All allocations are Pareto efficient.

Contract curve is used to represent (typically shown as running from bottom left to top right corners of Edgeworth box)

b)

Given a relative price (exchange rate) for products, we can divide a substantial endowment between two individuals. The final division of items achieved via trade is restricted optimal for both. As a result, the indifference curves touch and have a similar tangent.

We can calculate the relative price and slope of line EJ which is the common tangent of the indifference curves.

Consider the situation from R’s point of view, R maximizes her/his utility by trading accepting the price ratio determined in the market or alternatively, allowing S to reach a target utility.

Offer curve is diagrammatic representation of R’s most preferred affordable allocations or S’s most preferred affordable allocations.

For there to be market clearing, R and S need to have feasible demands. We need to be at the point where both are maximising given the other’s demands. Then we have market clearing in both markets. Also, we found out that the intersection of contract curves has the feasible trade line a common tangent.

c)

First theorem: It is impossible to make someone better off after a trade without making someone else worse off: on the contracting curve

In diagrams, this is any location at which offer and indifference curves might overlap; indifference curves share a common tangent.

Gradients MRS=ρ.

Only the price ratio, , supports endowment equilibrium, E.

Beginning with any endowment on line EJ1, equilibrium is at J1.

But imagine R finds this unacceptable. Insists on a bigger part of the outcome

There is no way to trade to a different conclusion.

However, S can transfer resources to R, and they can then trade to a new equilibrium.

According to the theorem, any allocation on the contract curve may be attained through trade from a set of endowments. So, assuming R and S agree on the desired outcome, all that remains is to select allocation within a set of endowments. Consider what happens in a family, you don't have to buy things for each other; merely pool your resources. It is also possible to apply to countries: Income redistribution schemes versus direct purchases vs voucher systems