Ex/PG/ECO/A/DSE10.19/2023

MASTER OF ARTS EXAMINATION, 2023

(2nd Year, 2nd Semester)

ECONOMICS

[INDUSTRIAL ECONOMICS]

Time : Two Hours Full Marks : 30

Answer any ***three*** of the followings:

1. There is a unit mass of sellers and a unit mass of buyers. Each seller produces a totally differentiated good at a constant unit cost c, which is assumed to be uniformly distributed over [0,1]. Buyer have unit demand for each good; they buy if they are offered a price below or equal to their reservation price v, which is also assumed to be uniformly distributed over [0,1]. Both c and v are the private information. Further, p_r and P_t respectively denote 'ask price' and transaction fee corresponds to 'bid-ask spread'. Now consider the following two different model of intermediaries:

   Dealer Model:

   There are two stages of interaction. The dealer in the first stage determines both the p_r and P_t then in the second stage agents (sellers and buyers) simultaneously decide over whether to participate or not.

   Platform Intermediation Model:

   There are three stages of interaction. The dealer in the

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first stage determines the P_t then in the second stage each seller chooses the p_r. Finally, in the third stage each buyer decides over whether to participate or not.

i) Discuss the price determination of these two model separately.

ii) Is there any difference in the outcomes of the above two models? Give intuition against your answer.

6+4

2. Consider a monopoly platform serving two distinct groups of users. Each group $i = a, b$ comprises a unit mass of users who interact on the platform. The platform charges (possibly different) membership fees for two groups, M_a and M_b. The constant marginal cost of attracting users on the platform is normalized to zero. A user of group i enjoys the following net utility when interacting on the platform with users of the other group:

$$U_i = u_i + \gamma_i n_j - M_i$$

Where u_i is the intrinsic value of being on the platform, γ_i measures the indirect network effect provided by an additional member of side j on each member of side i, n_j is the number of members of side j on the platform. We assume u_i is drawn from a uniform distribution on $[0, v_i]$. As for indirect network effects, we assume that they are positive on both sides $(\gamma_a, \gamma_b > 0)$.

distributed on the unit interval.

i) Assume fulfilled-expectations derive the demand function for the network good.

ii) Show that there is a tendency towards underprovision of the network good by the monopolist, and even by perfectly competitive firms.

5+5

5. Suppose consumers are located uniformly on a circle with circumference equal to unity. Firms are located around the circle, and all travel occurs along the circle. Consumers wish to buy one unit of the good, have unit transport cost t, and are willing to buy at the smallest generalized cost so long as the latter does not exceed the gross surplus they obtain from the good (v). Each firm is allowed to locate in only one location. There is a fixed entry cost $f > 0$. Once a firm is in and is located at a point on the product space, it faces a marginal cost $0 < c < v$. Consider the following two-stage game: In the first stage, potential entrants simultaneously choose whether or not to enter. Let n denote the number of entering firms. Those firms do not choose their location but rather are authomatically located equidistance from one another on the circle. Show that market may generate socially excessive entry. What happened if the transport cost is quadratic type? 7+3

$v > 0$ measures the network effect, n^e is the expected number of users joining the network and θ is uniformly distributed on the unit interval.

i) Identify the indifferent consumer for a given price p and a given expected network size n^e.

ii) Express the willingness to pay for nth unit of the good when n^e units are expected to be sold; check that the 'low of demand' effect conflicts with the 'network expansion' effect.

iii) Express the fulfilled-expectations demand curve and draw it. In particular, show that for $v \leq a$, the fulfilled-expectations demand is decreasing everywhere and there is a single equilibrium for all $p \leq a$. On the contrary, for $v > a$, show that the fulfilled-expectations demand has both an increasing and a decreasing portion; characterize the range of prices for which two levels of demand satisfy the equilibrium condition. 3+3+4

4. Consider the market for a single network good and suppose that consumers differ in their valuation of the network benefits. To capture this idea, write the consumer's utility function for joining the network as $U(\theta) = a + v\theta n^e$, where a is the standalone benefit, $v > 0$ measures the network effect, n^e is the expected number of users joining the network and θ is uniformly

i) Derive the number of participating users on side i as a function of the number of participating users on the other side.

ii) Solve for the system of equations that you derived in part (i) so as to express the number of participating users on the two sides as a function of two membership fees. Why is it legitimate to assume that $\gamma_a \gamma_b < 1$? Discuss your answer.

iii) Suppose now that $\gamma_a = \gamma \in (0,1)$ and $\gamma_b = 0$; that is, users on side a welcome more users on side b whereas user on side b are unaffected by any change in participation on side a. To simplify the analysis, set $v_a = v_b = 1$. Use your answers to part (ii) to solve the profit maximizing problem of the monopoly platform. Express the membership fees as well as the platform's profit at the optimum. 3+3+4

3. Consider the market for a single network good and suppose that consumers differ in their valuation of both the standalone and the network benefits (it can indeed be argued that it is more plausible that a user who has a higher value for the standalone component of a technology also assigns more importance to the size of its network). To capture this idea, write the consumer's utility function for joining the network as $U(\theta) = \theta(\alpha + vn^e)$, where a is the standalone benefit,

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