

MA Examination 2023
Semester II
Economics
Course C-6
(Micro Economics -II)

Time 3 hrs

Full Marks 40

Questions are of value as indicated in the margin
Answer **any four** questions

- 1(a) When does an (expected) utility function on the space of lotteries have the von-NeumannMorgenstern form?
(b) Show that a Utility function has the VNM form if and only if it is linear? (3+7)
2. (a) Explain why the Bernoulli utility function of a risk averse consumer is concave and show that this implies that the certainty equivalent of an uncertain event is less than its expected value.
(b) Explain in this context the Arrow Pratt measure of absolute risk aversion. (7+3)
3. (a) Using an example, describe the method of arriving at an equilibrium of a simultaneous move game through the iterated elimination of dominated strategies
(b) Describe the Bertrand Duopoly game where firms compete in prices. Show how the equilibrium of this game is obtained by iterated removal of dominated strategies in the case where (i) unit cost of both firms are equal, (ii) unit cost of firm 1 is lower than firm 2 (4+6)
- 4 Consider a model of Cournot Oligopoly with a linear (inverse) demand curve

$$p = a - bQ, \quad Q = \sum_{i=1}^n q_i$$

and constant unit costs $C_i(q_i) = c_i q_i$

- (a) Show that in case of a duopoly with different unit costs $c_1 \neq c_2$ if the unit cost of Firm 1 increase the optimum quantity produced by that firm decreases in equilibrium
(b) If there are n identical firms with same unit costs $c_1 = c_2 = \dots = c_n$, the equilibrium output of each firm decreases while the total output increases if the number of firms increase (5+5)

5. Consider the following sequential move game between a potential entrant who can choose to enter or not and an incumbent monopolist who can share the market or fight.

		Incumbant Monopolist (M)	
		Share	Fight
Entrant	Enter	$\Pi_C - S, \Pi_C$	$\Pi_D - S, \Pi_D$
	Not Enter	$0, \Pi_M$	$0, \Pi_M$

Note here that the first entry refers to Entrant's profits and the second to Monopolist's profits. Further, Π_M is the profits of the monopolist in absence of entry, while Π_C are the ordinary Cournot profit's in case of entry. The Entrant has to pay an additional set up cost S . Π_D are profits of the firms if the monopolist chooses to 'fight' by raising output so that prices are very low. We assume that $\Pi_M > \Pi_C > \Pi_C - S > \Pi_D > 0 > \Pi_D - S$

- (a) What are the Nash Equilibrium of this Game
 (b) Explain the concepts of 'first mover advantage' and elimination of equilibria based on 'non-credible threats' in the context of this sequential move game (2+8)
- 6 (a) Show that it is usually difficult to sustain collusion in duopoly context when the firms operate and interact for a finite number of periods.
 (b) Can collusion be sustained if firms operate / interact for a infinite number of periods ? If so, under what conditions? (6+4)
- 7 Consider a Cournot Duopoly where the market demand and unit cost of firm 1 are known to both firms. However only firm 2 knows its own unit cost. Firm 1 knows that it is low C_L with probability p and high C_H with probability $1 - p$. Show that
 (a) The high cost firm produces more than it would if its costs were known to both firms
 (b) Is this also true of the low cost firm (5+5)
8. Consider a labor market with 2 types of workers – high ability and low ability – known only to the worker but not to firms who know only that 50% are of high ability (productivity Rs 10,000) and 50% are of low ability (productivity Rs 4000). The reservation value of a high ability workers is Rs 8000 and of low ability worker is Rs 2000
 (a) Show that under these circumstances only low ability workers remain in the labor market. (4)
 (b) What happens if the probability that workers are high ability goes up to 80% ? (1)
 (c) Can you explain how the high ability workers in this market would be able to 'signal' that they have high ability (4+1+5)