MIDTERM EXAMINATION - MICROECONOMICS

TIME: 2 HOURS, INSTRUCTOR: DEBASIS MISHRA

All the questions are with reference to the models taught in the lectures.

1. Define competitive equilibrium with transfers. State (without proof) the two fundamental theorems of welfare economics (explain your notations clearly). (**10 marks**)

2. Define the axioms that characterize the expected utility form of preference over lotteries. (**4 marks**)

   - Verify which of these axioms are satisfied by the following preference over lotteries. The DM assigns a utility function $u : Z \rightarrow \mathbb{R}$, where Z is the set of outcomes. For any pair of lotteries $p, q \in L(Z)$, it evaluates $p \succeq q$ if and only if

   $$\max_{z \in Z} u(z)p(z) \geq \max_{z \in Z} u(z)q(z).$$

   (**6 marks**)

3. When do we say that a DM is risk averse? (**5 marks**)

   - Given an increasing Bernouli utility function u, the certainty equivalent of lottery F over a set of monetary outcomes is an amount $c(F, u)$ such that $u(c(F, u)) = \int u(z)dF(z)$. Show that a Bernouli utility function u of a risk averse DM satisfies

   $$c(F, u) \leq \int x dF(x).$$

   (**5 marks**)

4. Given two distributions F and G over monetary outcomes, when do we say that (a) F first order stochastically dominates G and (b) F second order stochastically dominates G. (**4 marks**)

   - Suppose there are three monetary outcomes: $z_1 = 100, z_2 = 200, z_3 = 300$. Consider two lotteries p and q as follows.

   $$p(z_1) = 0, p(z_2) = 1, p(z_3) = 0.$$

   $$q(z_1) = q(z_2) = q(z_3) = \frac{1}{3}.$$

   Here, $p(z_i)$ and $q(z_i)$ for $i \in \{1, 2, 3\}$ denotes the probability of outcome z_i occurring in lottery p and q respectively. Discuss if the following statements are true or false. (**6 marks**)

- Every DM with a Bernouli utility function increasing in money prefers p to q.
- Every risk averse DM with a Bernouli utility function prefers p to q.