# INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR
## Mid-Autumn Semester Examination 2022-23

**Date of Examination:** 22.09.2022 **Session:** (FN/AN) FN **Full Marks:** 30 **Duration:** 2 hrs
**Subject No.:** EM21203/HS21203 **Subject Name:** Microeconomics-I
**Department/Center/School:** Humanities & Social Sciences
**Specific charts, graph paper, log book etc., required.** No
**Special Instruction:** All the questions are compulsory. Read the question paper carefully. No queries will be entertained during examination.

1. Argue whether the following statements are true, false or uncertain giving appropriate reason in favour of your answer. If required, prove or disprove the statement: 3x3 = 9

   (a) If the market demand function is monotonically decreasing in price, so are the underlying individual demand functions.
   (b) Slope and elasticity of demand functions are always inversely related.
   (c) All supply curves passing through the origin are unitary price elastic.

2. For each sentence below describing changes in the rice market, note whether the statement is true, false, or uncertain, and explain your answer. You will find it helpful to draw a graph for each case.

   (a) If consumer income increases and worker wages fall, quantity will rise, and prices will fall.

   (b) If the prices of fertilizer and pesticide increase and the monsoon season has insufficient rain, quantity and price will both fall.

   In each case, you must draw a graph that shows the original supply and demand curves, plus the new curves after the changes. You must then consider whether it matters or not how far the curve shifts in response to the change in the parameter indicated. 2+2

3. Let the marginal revenue function be given by $MR = 28-15x+2x^2$.
   Find the total revenue (TR) function and the demand function. 3.5

4. Derive the demand function for which the elasticity of demand is the constant k. 3.5

P.T.O.

5. Suppose you are the in-charge of setting the price of basketball tickets for your hall team's match in inter-IIT competition. From previous experience, you estimate the demand function to be

$$P = 50 - 0.00166Q,$$

where P represents price in dollars per seat, and Q represents seats that could be sold per game. The seating capacity is 25,000 seats. Determine the number of tickets that would be sold at a ticket price of $15 each. Further determine the consumer surplus. 4

6. In a city with a medium sized population, the equilibrium price for a city bus ticket is $1.00, and the number of riders each day is 10,800. The short-run price elasticity of demand is -0.60, and the short-run elasticity of supply is 1.0.

(a) Estimate the short run linear supply and demand curves for bus tickets.

(b) If the demand for bus tickets increased by 10% because of a rise in the world price of oil, what would be the new equilibrium price of bus tickets?

(c) If the city council refused to let the bus company raise the price of bus tickets after the demand for tickets increases (see (b) above), what daily shortage of tickets would be created?

(d) Would the bus company have an incentive to increase the supply in the long run given the city council's decision in (c) above? Explain your answer. 6