

Course 001: Microeconomic Theory

Department of Economics, Delhi School of Economics

Midterm exam, September 15, 2014.

Answer both questions. Show your reasoning and derivation.

1. [20 marks] Mahi consumes only two divisible goods: cricket bats (x_1) and gloves (x_2). He has the utility function

$$u(x_1, x_2) = (x_1 - 1)^{\frac{1}{3}} (x_2 + 1)^{\frac{2}{3}}$$

The prices of the two goods are p_1 and p_2 , and Mahi's income is $y > p_1$.

- (a) Derive Mahi's Marshallian demand functions for bats and gloves.
 - (b) Give parameter conditions under which Mahi consumes no gloves ($x_2 = 0$).
2. [30 marks] The market for samosas has the inverse demand function

$$p = 60 - q$$

Each firm can produce samosas according to the cost function $c(y) = 8 + 2y^2$, where y is the firm's output.

- (a) In a perfectly competitive market with 20 price taking firms, what will be the equilibrium price and quantity in the market?
- (b) What will be the price, quantity and number of firms in the long run, when free entry and exit are possible?
- (c) The government, worried about the health risk of junk food, wants to impose a sales tax on samosas so that total consumption in the market is 20 samosas in the long run. What should be the tax rate?
- (d) A new minister decides that people should be left to mind their own health, but taxing samosas would be a good source of government revenue. If he wants to maximize long run tax revenue, should the minister raise or lower the tax rate?