IIT-PATNA

MIDSEM Exam

HSS-201 (Microeconomic Theory)

Marks-30 **Weight-30%** **Duration- 120 Minutes** **Date-28 September, 2018**

1) In 2008, the Times of India Media Group earned revenues of Rs.668 million from circulation, Rs.1.077 billion from advertising, and Rs.181 million from other sources. The Group decided to raise circulation prices and trim less profitable readership. In May 2009, the New York Times planned to raise its weekday cover price from Rs.1.50 to Rs.2. The previous year, the Times had raised the price from Rs.1.25 to Rs.1.50, and circulation fell 3.6% to 1.04 million.
   (a) Using the 2008 price and circulation information, calculate the own price-elasticity of demand for the Times of India weekday edition.
   (b) At the current price of Rs.1.50, and assuming 300 weekdays a year, what is the annual revenue from weekday sales?
   (c) Consider the expected 2009 price increase from Rs.1.50 to Rs.2. What is the percentage change in price?
   (d) Suppose that the expected 2009 price increase from Rs.1.50 to Rs.2 does indeed yield Rs.40 million in incremental revenue. What is the percentage change in revenue?
   (e) Calculate the price-elasticity of demand which would imply the Rs.40 million increase in revenue.
   (f) Compare the elasticities in (a) and (e). Does the difference make intuitive sense?

   (2+2+1+1+2+2=10)

2) Derive the Slutksy equation to establish that **Total effect** for change in price for any normal good is sum of **Substitution effect** and **Income effect**. (5)

3) What do you mean by ridge line? A CES (Constant Elasticity of Substitution) production function is expressed as, $\mathbf{Q= A[\alpha*K^{-\rho}+(1-\alpha)*L^{-\rho}]^{-1/\rho}}$

   Here **Q** is output, **K** is capital, **L** is labour, $0<\alpha<1$, $A>0$ and ρ is a constant term. Prove that if ρ tends to be zero then the CES function becomes a Cobb-Douglas production function.

   (2+3=5)

4) Derive mathematically the relation between marginal product and average product of labour and graphically show the relation.

   Why long run average cost (LAC) curve is an envelope of short run average cost (SAC) curves? (3+2=5)

5) Show that for convexity of any indifference curve, quasi-concavity of corresponding utility function is a necessary condition. (5)