

**Indian Statistical Institute**  
**Bachelor of Statistical Data Science**  
**Year 2024, Semester 1**  
**End-Semester Examination**  
**Economics 1**  
**Full Marks 50**  
**Time 2:00 Hours**

**Answer all questions.**

1. Explain the significance of the phrase *ceteris paribus* (other things remaining the same) in the statements of law of demand and law of supply. (5)
2. The estimated U.S. linear corn demand function is  $Q = 15.6 - 0.5p$ , where  $p$  is the price in dollars per bushel and  $Q$  is the quantity demanded in billion bushels per year. What is the elasticity of demand at the point on the demand curve where the price is  $p = \$7.20$  per bushel? (5)
3. Suppose the utility function of the consumer for commodity  $x$  and  $y$  is given as
$$U = \frac{1}{3} \log x + \frac{2}{3} \log y$$
The price of commodity  $x$  is 4 per unit and that of commodity  $y$  is 2 per unit. The total income of the consumer is 24. Find the optimal choices of the consumer for commodities  $x$  and  $y$ . (5)
4. How do you distinguish between the short-run and long-run? What are the main characteristics of a perfect competitive market? What is the significance of studying perfect competitive market? (1+2+2=5)
5. Given that a competitive firm's short-run cost function is
$$C(q) = 100q - 4q^2 + 0.2q^3 + 450,$$
what is the firm's short-run supply curve? If the price is  $p = 115$ , how much output does the firm supply? (6+4=10)
6. Explain the following two concepts relating to national income:
  - a) Inventory,
  - b) Intermediaries.(2.5+2.5=5)
7. Consider the following questions.
  - a) A farmer grows a bushel of wheat and sells it to a miller for \$1.00. The miller turns the wheat into flour and then sells the flour to a baker for \$3.00. The baker uses the

flour to make bread and sells the bread to an engineer for \$6.00. The engineer eats the bread. What is the value added by each person? What is GDP?

- b) Suppose a woman marries her butler. After they are married, her husband continues to wait on her as before, and she continues to support him as before (but as a husband rather than as an employee). How does the marriage affect GDP? Explain.

(3+2+3=8)

8. Consider the following questions.

- a) Let the autonomous expenditure of the country be 20. The people's consumption is 10 even when they have no income. The marginal propensity to consume is 0.8. Find the equilibrium income of the country.
- b) Suppose during a pandemic the government increases spending by 2500 crore rupees. The surveys report that the marginal propensity to consume of the people is 0.75. By how much will equilibrium national income (GDP) of the country increase?

(3+4=7)

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