

**ESSAY. Write your answer in the space provided or on a separate sheet of paper.**

- 1) The Catawba River City Park has a low demand  $D_1$  during work days, but on Saturday and Sunday demand increases to  $D_2$  on Saturday and Sunday. The demand and marginal revenue functions are:

$$D_1 = P_1 = 2 - 0.001Q_1$$

$$MR_1 = 2 - 0.002Q_1$$

$$D_2 = P_2 = 20 - 0.01Q_2$$

$$MR_2 = 20 - 0.01Q_2$$

where  $Q$  = number of cars entering the park each day. The marginal cost of operating the park is the same on weekdays and weekends:

$$MC = 1 + 0.004Q.$$

- a. In order to control crowds, the park's management uses third-degree price discrimination. This scheme controls crowds and makes sure the park is self-supporting. Calculate the appropriate prices to charge, and determine the number of cars entering the park,  $Q_1$  and  $Q_2$ .
- b. Explain how switching from a uniform pricing scheme to a discrimination pricing scheme affects the market.
- 2) The BCY Corporation provides accounting services to a wide variety of customers, most of whom have had a business association with BCY for more than five years. BCY's demand and marginal revenue curves are:
- $$P = 10,000 - 10Q$$
- $$MR = 10,000 - 20Q.$$
- BCY's marginal cost of service is:
- $$MC = 5Q.$$
- a. If BCY charges a uniform price for a unit of accounting service,  $Q$ , what price must it charge per unit, and how many units must it produce per time period in order to maximize profit? Calculate the consumer surplus.
- b. If BCY could enforce first-degree price discrimination, what would be the lowest price that it would charge and how many units would it produce per time period?
- c. With perfect price discrimination and ignoring any fixed cost, what is total profit? How much additional consumer surplus is captured by switching from a uniform price to first-degree price discrimination?