MBA (FT) – November 2022

MBAFT-I. 6103 Managerial Economics

Time: 3 hours *Max. Marks: 70*

Answer all questions

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1. Vartika has a budget of Rs. 10 for the two items she drinks every day at work --- tea denoted by t and coffee denoted by c. Her utility function for these two commodities is given by $U(t,c) = tc + 10t$.

   i. Does Vartika's utility function follow the Law of Diminishing Marginal Utility? Explain what it means qualitatively . Define MRSx,y. Does the MRSx,y diminishes with increasing x? Explain. Draw the indifference curves for $U_1 = 80$, $U_2 = 100$ and $U_3 = 120$ in the same graph.

   ii. If $P_t = 1$ and $P_c = 2$ and $I = 10$, find Vartika's optimal choice numerically and graphically using appropriate graphs.

   iii. Find Vartika's demand function for coffee. Plot the function over the following range of prices: $P_c = 0.25, 0.5, 1, 2, 4$. If there fall in the price of coffee from 1 to 0.5, would there be a positive or negative or no income and substitution effects? Explain using appropriate graphs. Find the extent of income and substitution effects (if any) numerically as well.

   (5+5+5 marks)

2. *Chachi's Madua-Kulcha* is a monopoly (in the area where it is located) eating joint. *Chachi* has a constant marginal cost of 50 and a sunk fixed cost of 2,000 and faces a demand curve given by P = 100 – 0.5Q

   i. What is the Inverse Elasticity Pricing Rule (IEPR)? Find *Chachi*'s profit maximizing price and quantity using IEPR.

   ii. What is relationship between total revenue and price in this case? Derive and show graphically. Will Chachi be better off in terms of revenue by increasing price by a small amount since she is a monopolist? Explain.

   iii. What is the 'choke price' for a linear demand function, $Q = (a - P)/b$, : where a and b are positive constants? Find the relationship between choke price for the above mentioned general linear demand function and a producer with constant marginal cost = c. Now coming back to the example here: suppose for *Chachi* the choke price increases by Rs. 10, can we say exactly that in that case *Chachi* will increase t price by exactly Rs. 5? Explain your answer. Also explain what is the qualitative reason for increase in choke price.

iv. Seeing *Chachi*'s success, a few other stalls start popping up in the same location and within two years, the market has changed from a monopoly to a competitive market. What will happen in the short-run? In the long-run? Explain using variables that you think are important in this case.

(5+5+5+5 marks)

3. i. To produce cake, you need eggs (E) and premixed ingredients (I). Every cake needs exactly two eggs and one package of ingredients. When you add two eggs to one package of ingredients, you produce only one cake. If you have only one egg, you cannot produce two cakes even though you have two packages of ingredients. Draw several isoquants of the cake production function. Write a mathematical expression for this production function. What can you say about returns to scale for this function?

ii. The production function for the personal computers of DISK, Inc., is given by $q = 10K^{0.5}L^{0.5}$ where q is the number of computers produced per day, K is hours of machine time, and L is hours of labor input. DISK's competitor, FLOPPY, Inc., is using the production function $q = 10K^{0.6}L^{0.4}$

a. If both companies use the same amounts of capital and labor, which will generate more output? Explain. Compare the labor demand functions for both the companies. Use the usual notation: w as the wage rate, r as rental rate of capital and q as production target. For which company, the elasticity of substitution is larger? Explain.

b. Assume that capital is limited to 9 machine hours, but labor is unlimited in supply. In which company is the marginal product of labor greater? Explain using appropriate graphs. Does the Law of Variable Proportion apply for either of the companies? Explain.

(10+5+5 marks)

4. Netflix experienced some membership turbulence in 2016 as a price increase was phased in for its US subscribers. In May 2014, Netflix announced that the price of its standard subscription service would increase from $8 to $9. However, established customers were allowed to stay at the $7.99 price for two years. In 2015, Netflix increased the standard price to $9.99. As a result of the pricing plan and the deferred price increase, in May, 2016, the standard pricing plan for long time customers of Netflix increased from $7.99 per month to $9.99 per month. Netflix began notifying customers in April that the price increase would become effective in the second quarter.

Netflix was trying to implement price increases more slowly after a 2011 increase led to negative publicity and a customer backlash. In that case, Netflix separated its streaming and DVD services, and charged separately for both services.

However, regardless of the implementation of the price increase, the higher monthly prices seem to have impacted the growth of membership among US subscribers. In the two quarters before the price increase, Netflix added net membership of 1.6

million and 2.2 million members. By contrast, the number of members added in Q2 was only 160,000, and in Q3 only 400,000. The Q2 growth in US subscribers was the lowest since Netflix began reporting those numbers in 2012.

US Streaming (millions)	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016
Revenue	1026	1064	1106	1161	1208	1304
Contribution Profit	340	344	379	413	414	475
Contribution Margin	33.1%	32.3%	34.3%	35.6%	34.3%	36.4%
Paid Memberships	41.1	42.1	43.4	45.7	46.0	46.5
Total Memberships	42.3	43.2	44.7	47.0	47.1	47.5
Net Additions	0.90	0.88	1.56	2.23	0.16	0.40
Monthly Revenue per Paid Member	$ 8.33	$ 8.43	$ 8.49	$ 8.47	$ 8.75	$ 9.40
Percentage Chg. Rev		3.7%	3.9%	5.0%	4.0%	7.9%
Percentage Chg. Memberships		2.5%	3.2%	5.3%	0.6%	0.9%
				Source: Netflix 10Q Q3, 2016		

According to a MarketWatch article on the price increase:

Netflix said Monday that customers who learned in April that the price was about to increase had begun canceling their subscriptions, leading to unexpected "churn." Netflix did not flat-out say in its letter to investors that the price increase led to higher churn among subscribers, however, instead saying it coincided with "press coverage" of the rate hike and that subscribers misunderstood "the news as an impending new price increase rather than the completion of two years of grandfathering."

The stock market reacted to news of Netflix price increase as well. The stock closed at $102.23 as of March 31, 2016. After the release of second quarter earnings in July, the stock price had fallen to $85.84 per share, a decline of 16%. This decline wiped out almost $7 billion of shareholder value during this period. Most of this decline was immediately following the release of the second quarter numbers.

With competition increasing in for streaming services, especially with the growth of Amazon Prime Video and Hulu, the decline in membership growth could be a troubling sign.

i. Can we use the information in the case to estimate the elasticity of demand for Netflix subscription services? Calculate an own-price elasticity of demand?

ii. What do we expect to happen to Netflix's revenue due to the price increase? Explain.

iii. What do we expect to happen to Netflix's profit due to the price increase? Explain.

(5+5+5 marks)