Industrial Organization and Antitrust Policy
Exam 2
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Name: _____

Question:	1	2	3	Total
Points:	80	30	30	110
Score:				

All of this exam is multiple choice. However, to be awarded points, I still need to see how you worked out your questions in scratch paper. Once you are done with all of them, please report your answers in the answer sheet below. Chosen answers should be market with a circle **O**. If you mark the wrong answer, please make an **X** on the one you don't wish to report and proceed to making a circle on the desired choice. In order to minimize corrections, please report your answers in this answer sheet once you are done with your solutions and feel comfortable with them. Be mindful of your time.

Question	Part	Subpart	**A**	**B**	**C**	**D**
1	a	i				
1	a	ii				
1	a	iii				
1	a	iv				
1	a	v				
1	b	i				
1	b	ii				
1	b	iii				
1	b	iv				
1	b	v				
1	c	i				
1	c	ii				
1	c	iii				
1	c	iv				
1	c	v				
1	c	vi				

Question	Part	Subpart	**A**	**B**	**C**	**D**
2	a					
2	b					
2	c					
2	d					
2	e					
2	f					

Question	Part	Subpart	**A**	**B**	**C**	**D**
3	a	i				
3	a	ii				
3	a	iii				
3	a	iv				
3	a	v				
3	a	iv				

1. Once upon a time there was a market in a kingdom far far away. The market could be expressed by the demand $Q = 200 - P$, in which $Q = \sum_{i=1}^{N}$ was the aggregate quantity. There were $N \geq 1$ firms in this market, and the marginal cost for each firm i was a constant c and equal to average cost.

   (a) Cournot Duopoly: Suppose the two firms in this market compete choosing level of output, and marginal cost is the same across firms $c_i = 30 \forall i$.

      i. (5 points) What will be the Cournot-Nash equilibrium?
         A. $PSNE = \{(86.67, 86.67)\}$
         B. $PSNE = \{(56.67, 56.67)\}$
         C. $PSNE = \{(170, 170)\}$
         D. $PSNE = \{(3211.5, 3211.5)\}$

      ii. (5 points) What will be the market price?
         A. 56.67   B. 86.67   C. 113.33   D. 143.33

      iii. (5 points) How about each firm's profit in equilibrium?
         A. 4911.6   B. 7225   C. 3211.5   D. 7933.8

      iv. (5 points) What is the Herfindahl Hirschman Index?
         A. 2500   B. 4444   C. 5000   D. 10000

      v. (5 points) In Cournot competition the equilibrium output of firm i is a function
         A. increasing in firm i's costs.
         B. Decreasing in firm i's costs and decreasing in the rival's costs
         C. Decreasing in firm i's costs and increasing in the rival's costs
         D. Decreasing in the rival's costs

   (b) There was a change in legislation in this market which required a massive amount of investment to be performed by each firm to stay in business. The value of the investment shifted the cost structure of the firms in such a way that marginal costs remained the same, but average total cost became decreasing over a large range of output. The fixed cost (6000 $) were so high that the the only way to stay in business was to become a monopolist.

      i. (5 points) What is monopolist's chosen level of output?
         A. 85   B. 115   C. 170   D. 200

      ii. (5 points) What will be the market price"
         A. 85   B. 115   C. 170   D. 200

      iii. (5 points) How about the monopolist's profit in equilibrium?
         A. 7225   B. 1225   C. 9775   D. 3775

      iv. (5 points) What is the HHI in this market?
         A. 5555   B. 4444   C. 5000   D. 10000

      v. (5 points) How much is consumer surplus in this case?
         A. 2812.5   B. 3612.5   C. 6612.5   D. 7212.5

(c) After some time, the Agencies were concerned with he effect on market concentration generated by this regulation, so they decided to open exceptions for new entrants creating a competitive fringe with marginal cost $MC_{CF} = 30+Q$. Since the incumbent was already there as a monopolist, it retained its price-maker status. The previous investment made by the incumbent were then sunk costs.

   i. (5 points) What is the level of output the dominant firm chooses to produce?
      A. 42.5   B. 72.5   C. 85   D. 127.5
  ii. (5 points) What is the market price determined by the dominant firm?
      A. 42.5   B. 72.5   C. 85   D. 127.5
 iii. (5 points) What is the dominant firm's profit in equilibrium?
      A. 1225   B. 3612.5   C. 1156   D. 8128.12
  iv. (5 points) How much is the competitive fringe producing?
      A. 42.5   B. 72.5   C. 85   D. 127.5
   v. (5 points) How much is consumer surplus in this case?
      A. 1225   B. 3612.5   C. 1156   D. 8128.12
  vi. (5 points) What is the HHI in this market?
      A. 5555   B. 4444   C. 5000   D. 10000

2. Limit Pricing

   Kikkoman is the dominant supplier in the market of say sauce, but it faces continuous entry threats. Suppose that Kikkoman incurs a cost $C(q_1) = 6q_1$ Kikkoman faces potential entry by Red Zen, which produces a perfect substitute for Kikkoman's product. However, Red Zen's production costs are given by $C(q_2) = 100q_2 - 1.25q_2^2 + .05q_2^3$ so that $MC_2 = 100 - 2.5q_2 + .15q_2^2$. The demand for soy sauce is given by $D(P) = 120 - P$. The incumbent can attempt to deter entry by engaging in "limit pricing". In fact, it would set a quantity so that the entrant will not be able to make a profit.
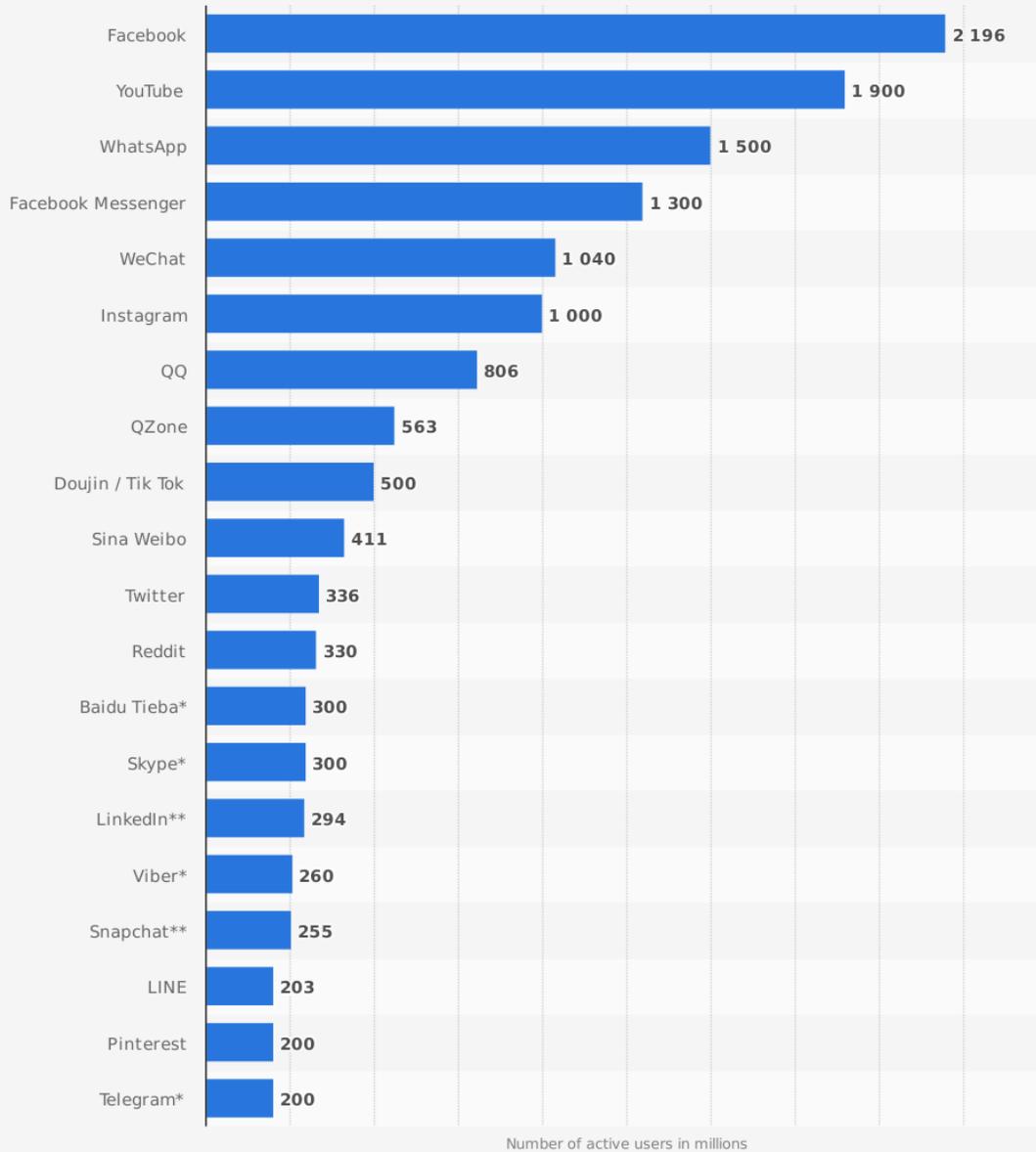
   (a) (5 points) What is the Limit Price?

      A. 100   B. 120   C. 97.2   D. 99.7

   (b) (5 points) What is the quantity associated with this Limit Price?

      A. 2.5   B. 16.8   C. 20.3   D. 22.8

   (c) (5 points) What is consumer surplus under limit price?

      A. 206.25

      B. 259.92

      C. 412.5

      D. 519.84

   (d) (5 points) The assumptions for limit price don't include

      A. The incumbent must still make profits

      B. The incumbent has market power

      C. The incumbent knows entrant's cost structure

      D. Products are homogeneous

   (e) (5 points) A price is deemed predatory if

      A. it harms competitors

      B. it is below an entrant's ATC

      C. it is below some measure of cost forever

      D. It is below incumbent's ATC

   (f) (5 points) Areeda-Turner says price is predatory if when $P < MC$

      A. $P < AVC$

      B. $P > AVC$

      C. $P < ATC$

      D. $P > ATC$

3. Market Concentration

A recent study regarding the use of social networks in the world is expressed in Figure 1. As part of our antitrust investigation, we have to start by defining a market.

(a) Consider a market of social media composed by Facebook (we don't want to double count users, so for now assume users of Facebook messengers are already accounted for on Facebook users), WhatsApp, WeChat, Instagram, Twitter, Skype and Snapchat.

    i. (5 points) What is the market concentration as expressed by the CR4 in this market?
    A. 72.65   B. 86.55   C. 89.25   D. 91.35

    ii. (5 points) What is the market concentration as expressed by the HHI in this market?
    A. 1245   B. 4235   C. 3175   D. 2145

    iii. (5 points) What is the naive ΔHHI for a merger between WeChat & WhatsApp?
    A. 170   B. 710   C. 350   D. 490

    iv. (5 points) A measure or market Power
    A. Lerner Index
      B. Herfindahl Hirschman Index
      C. CR4
      D. Economies of Scale

    v. (5 points) Where does this potential merger fall regarding merger screening policy according to the US Department of Justice and Federal Trade Commission Horizontal Merger Guidelines (2010)?
    A. It does not raise significant anticompetitive effects
      B. The market was initially highly concentrated and becomes even worse after the merger
      C. The ΔHHI raises potential concerns, as well as the fact that the merger will result in a highly competitive market.
      D. Even thought the market starts as a highly competitive market, the ΔHHI is small enough that it doesn't generate significant anticompetitive concerns.

    vi. (5 points) In the European Union, the thresholds for considering a market to be unconcentrated is $HHI < 1000$, moderately concentrated $1000 < HHI < 1800$ and highly concentrated $HHI > 1800$. $\Delta HHI < 50$ usually aren't investigated, whereas $\Delta HHI > 100$ will likely be investigated. What can we say about European Commission as a competition agency as compared to US competition agencies?
    A. EC is more lenient with increases in concentration than US DOJ & FTC
      B. EC is more averse to increases in concentration than US DOJ & FTC
      C. There isn't enough information to assess how one relates with the other.
      D. There are more unconcentrated markets in Europe than in the US.

Most popular social networks worldwide as of July 2018, ranked by number of active users (in millions)

Social Network	Active users (millions)
Facebook	2 196
YouTube	1 900
WhatsApp	1 500
Facebook Messenger	1 300
WeChat	1 040
Instagram	1 000
QQ	806
QZone	563
Doujin / Tik Tok	500
Sina Weibo	411
Twitter	336
Reddit	330
Baidu Tieba*	300
Skype*	300
LinkedIn**	294
Viber*	260
Snapchat**	255
LINE	203
Pinterest	200
Telegram*	200

Number of active users in millions

Figure 1: Social Networks as of July 2018