

# ENTS 631, Telecommunications and Technology Policy

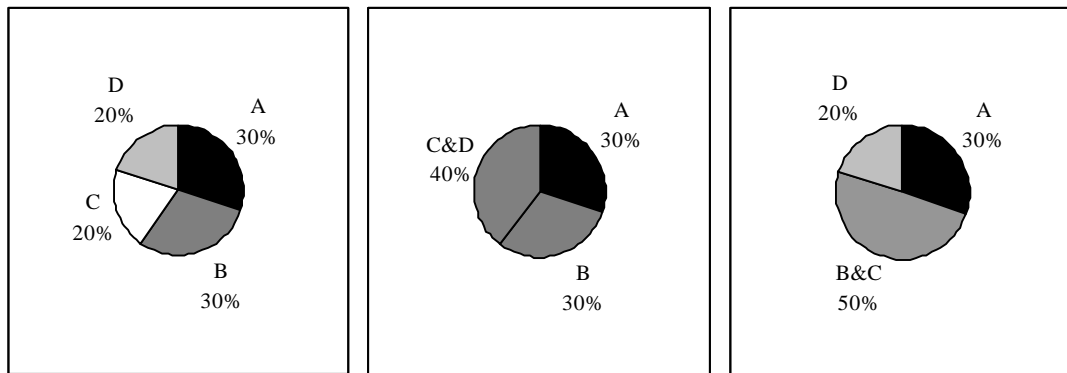
## Final Exam

### Instructions

<ul style="list-style-type: none"><li>• Read all the instructions before starting.</li><li>• You have <b>2</b> hours to complete this exam.</li><li>• Partial credit will be given</li><li>• Each question can be answered independently.</li><li>• The exam is worth 40 points.</li></ul>	<ul style="list-style-type: none"><li>• This exam is open book but you may not consult with your classmates.</li><li>• Put your answers in the exam books provided.</li><li>• Print your name on all the exam books you use.</li><li>• Grammar, spelling, and sentence structure will not be graded.</li></ul>
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### Question 1: Herfindahl Indices, Monopolization, and Antitrust (10 points)

There are four companies in the cellular market. A and B provide analog cellular service. C provides CDMA PCS service. D provides TDMA PCS service. C is thinking about merging with company D or B. The following three pie charts show current market share, market share if C&D merge, and market share if B&C merge.

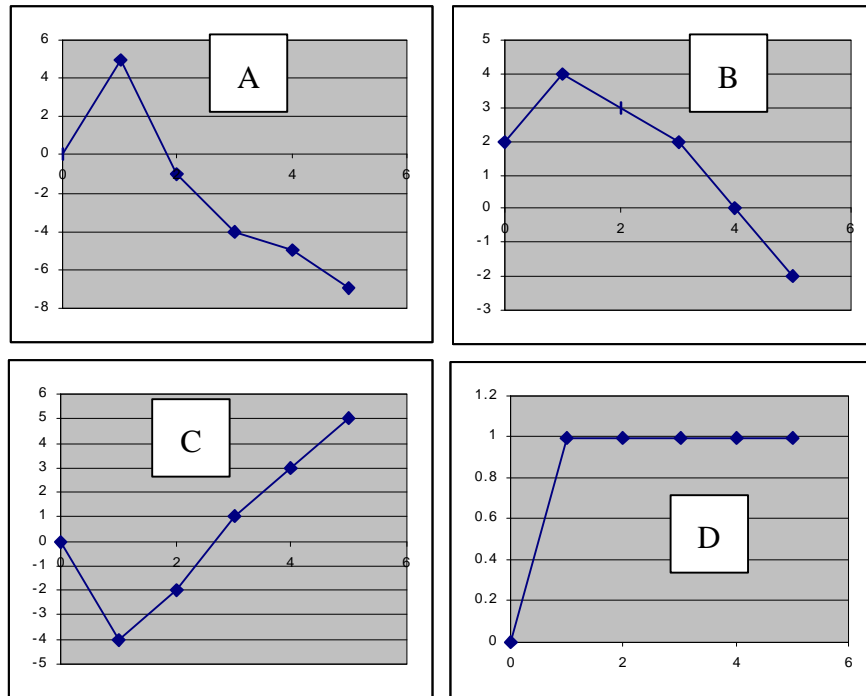


1.1. Compute the three Herfindahl Indices (HHI) for the three markets above. (5 points)

1.2. If the Department of Justice uses a rule of examining mergers in telecommunications with Herfindahl Indices greater than 3,500, does this mean either C&D and/or B&C will be prevented? What other information do you need? (5 points)

**Question 2: Natural Monopoly and Telecommunications Liberalization (10 points)**

The number of telecommunication companies in different markets varies widely. In the four charts below, you can see the annual profits (in millions of \$) summed over all companies (y axis) vs. the number of firms in the industry (x axis).



- 2.1. Identify the number of firms that will exist in the different markets. (5 points)
- 2.2. Describe which graph does the best job of describing the inter-exchange carrier (i.e. long distance) telecommunications market in the U.S. Why? (5 points)

**Question 3: Game Theory and Competitive Strategy (10 points)**

The competition of two local telephone companies getting into new markets (Cable or high-speed Internet) may be modeled using the following two games:

**Game #1**

		<b>Player B</b>	
		Cable	Internet
<b>Player A</b>	Cable	[ 10, 10]	[ 5, 5]
	Internet	[ 8, 9]	[ 15, 10]

**Game #2**

		<b>Player B</b>	
		Cable	Internet
<b>Player A</b>	Cable	[ 9, 12]	[ 11, 17]
	Internet	[ 15, 8]	[ 7, 9]

- 3.1. Find the Nash Equilibrium/ia for the two-scenarios above. (5 points)
- 3.2. Describe which game best describes reality if the two local telephone companies are in *adjacent* markets. Describe which game best describes reality if the two local telephone companies are in the *same* market. Why? (5 points)

**Question 4: Government Structure and Technology Policy/Politics (10 points)**

The making of technology policy occurs at many different places in the U.S. Government. Many times the organizations whose job it is to make policy influences technology development.

4.1. Identify what branch of the U.S. government {Executive, Legislative, Judicial, or Independent/no branch} the following organizations are in: (5 points/1 point each)

- The Federal Communications Commission
- The Department of Justice
- The Federal Trade Commission
- Defense Advanced Research Projects Agency
- The State Department

4.2. The Federal Communication Commission would like to promote ADSL (and other new high-speed Internet local access technologies). Are they in the position to make such developments occur? How? Identify another part of the government that might be more appropriate and describe how they can promote high-speed Internet local access technologies. (5 points)