Example Exam. University of Haifa.

Answer 5 out of the following 6 questions (20% each). There is also a bonus. If you have time, then you can answer the 6th question and I will take the 5 **best** questions for your grade. Time 2:30 hours with 30 minute extension.

Note that the questions and topics may vary on the actual exam. The exam will be given in both English and Hebrew.

1 Price Discrimination.

The university has decided that only special calculators can be used during the exam. The economics department has a monopoly on the calculators that are sold before and not during the exam. Both Jim and Sean are taking the micro exam. Jim feels that he can get by with only one calculator. Sean feels that a second calculator would be helpful in case the first calculator breaks down. The following table shows their valuations (note the number under the heading "2 calculators" means the valuation for two calculators rather than for the 2nd calculator). Assume it costs the university 5 pounds per calculator. (Assume if indifferent in valuation terms to buying or not, Jim/Sean buys.)

	1 calculator	2 calculators
Jim	£20	£20
Sean	£30	£40

(i) If the university could only charge one price per calculator, independent of who buys it or how many, what would they charge?
(ii) If the university could fully price discriminate (tell who is who and charge based on quantity), what would they charge for the various combinations?
(iii) If the university could not tell who is who, but can charge different prices for different quantities what would they charge?
(iv) If the university could tell who is who, but must charge a constant price per calculator, what would they charge?
(v) How do the profits compare in all the cases?

2 Bank Runs.

Take the Diamond-Dybvig model described in class with 2 impatient depositors and 2 patient depositors. Each depositor invested £1000 in the bank and was offered a contract: withdrawing today pays £1000, withdrawing tomorrow pays £2000 ($R = 2$). The bank had two possible means of investing its money: a long-term investment and a short-term investment. The long-term investment pays $R = 2$ times the amount invested tomorrow. Early liquidation of the investment today pays $L = 0.5$ times the original amount invested. The short term investment pays the original amount if it is withdrawn today or tomorrow.

(i) Assuming that the patient depositors wait until tomorrow to withdraw and the impatient depositors withdraw today, how should the bank divide its

assets between the short-term and long-term investment to match demands?

(ii) Assuming that all the impatient depositors withdraw their money today, represent the decisions of the patient depositors as 2x2 game (draw it).

(iii) Indicate any pure-strategy Nash equilibrium of the game .

3 Signalling.

Take a simplified Poker game between players A and B. Player A knows whether his hand is stong or weak. He can raise or fold. His payoff to folding is \$-1.00. When Player A folds, Player B receives \$1.00. If player A raises, then Player B must decide to call or fold. If player B folds, then he receives \$-1.00 and player A receives \$1.00. If player B calls, then he receives \$2.00 if A is weak and \$-2.00 if A is strong. Also in the case when B calls, A receives \$2.00 if he is strong and \$-2.00 if he is weak. Assume the odds of a strong hand is 80%. Find any equilibrium. Is it signalling or pooling?

4 Vertical Markets.

A monopoly has marginal cost of 5 and faces a demand of $q = 20 - p$. What price should he charge to maximize profits? Let us say it is a vertical market of two firms: supplier and retailer. What would the price would the supplier charge the retailer? What would be the price charged to the end consumer? If the supplier charged a franchise fee in addition to wholesale price, what would they be?

5 Asymmetric Information.

In the takeover game, assume that the value for the seller is uniformly distributed between 50 and 100. Assume that it is still worth to the buyer 3/2 times the seller's value. What should the buyer offer to the seller?

6 Network Externalities.

Students like to go to the Haifa Ball depending upon how many other students go there. Tickets cost 32 NIS each. There are 1000 students indexed by i from 1 to 1000. Student i has value $v_i = i$. Student i has utility (in shekels) for going to the Ball of $\frac{vi \cdot n}{5000}$, where n is the total number of students going to the Ball.

(i) If everyone believes $n = 500$, which students will be willing to go to the ball?

(ii) What is the threshold number of tickets sold above which it will be a success and below which it will be a failure?

(iii) What is the equilibrium of tickets sold if the ball is a success?

(iv) What is the equilibrium of tickets sold if the ball is a failure?

Bonus.

You will be matched with 4 other students. Tell me how much of a bonus you would like on the exam in percentage terms. Please write down a number 0 and 100 (fractions permitted). I will give the bonus to the student with the lowest request. Ties will be broken randomly.