UNIVERSITY COLLEGE LONDON

EXAMINATION FOR INTERNAL STUDENTS

MODULE CODE	:	**ECON2003**
ASSESSMENT PATTERN	:	**ECON2003A**
MODULE NAME	:	**Intermediate Microeconomics: Microeconomics of the Firm**
DATE	:	**18 May 2016**
TIME	:	**10:00 am**
TIME ALLOWED	:	**2 hours**

This paper is suitable for candidates who attended classes for this module in the following academic year(s):

2015/16

TURN OVER

SUMMER TERM 2016

ECON2003: MICROECONOMICS OF THE FIRM

TIME ALLOWANCE: 2 hours

Answer ALL questions from Part A on the Multiple Choice Question sheet. Answer TWO questions from Part B.

Part A carries 40 per cent of the total mark and questions in Part B carry 30 per cent of the total mark each.

In cases where a student answers more questions than requested by the examination rubric, the policy of the Economics Department is that the student's first set of answers up to the required number will be the ones that count (not the best answers). All remaining answers will be ignored.

PART B

Answer TWO questions from this section

B.1 Consider the following game in extensive form. Player 1 tosses a biased coin in private and then chooses one of two actions: $x = 1$ or $x = -1$. Player 2 sees the action player 1 picks (but not the outcome of the coin toss) and chooses one of two actions: $y = 1$ or $y = -1$. The game then ends. The players' payoffs are $(xy, -xy)$ for Player 1 and Player 2 respectively, if the coin showed Heads. The players' payoffs are $(-xy, xy)$ for Player 1 and Player 2 respectively, if the coin showed Tails. (The coin has a probability 1/3 of showing Heads when tossed.)

(a) Draw the extensive form of this game.

(b) List the pure strategies of both players in this game.

(c) What (mixed) actions must Player 1 use to make Player 2 believe that both outcomes of the coin toss are equally likely when they see $x = 1$ or when $x = -1$?

(d) Find a Nash equilibrium of this game where Player 1 chooses $x = +1$ for both outcomes of the coin toss. (You must describe all the actions Player 2 takes and why these are optimal.)

(e) Can you find a Nash equilibrium where Player 1 chooses $x = -1$ for both outcomes of the coin toss?

(f) Now consider the game where Player 2 can also see the outcome of the coin toss. How many pure strategies does each player have in this game? Find a subgame perfect equilibrium of this game.

B.2 A restaurant is planning to offer an all-you-can-eat lunchtime-special for students. If $0 \leq x \leq 2$ is the amount a student eats for lunch, the restaurant estimates that its potential customers are described by a uniform distribution on the interval $0 \leq x \leq 2$. A student, who eats an amount x for lunch and pays a price p, has a utility $x^2 - p$, but if they don't eaf lunch at the restaurant they have a utility equal to zero from eating on campus.

(a) Which student types (x's) go to the restaurant when price for the deal is p?

(b) What is the demand function of the restaurant?

(c) If the cost of serving a customer who eats x is $4cx$, what are the total costs of the restaurant when they set the price p?

(d) What are the restaurant's revenues when it sets the price p?

(e) Suppose $c = 1/6$ and competition forces the restaurant to set a price that gives it zero profit—what price does it set?

(f) Suppose $c > 0$ and the restaurant is a monopolist and is free to choose the price that maximises profit—what price does it set?

(g) The restaurant learns which customers have $x > 1$ and bars them from the deal. How does your answers above change?

B.3 A firm has decided to sell two size packages of biscuits. The firm's package for singles is sold at price p and contains x biscuits. Its package for families is sold at price q and contains y biscuits. Suppose that singles get utility $\sqrt{x} - p$ from a package that contains x biscuits at price p and families get utility $2\sqrt{y} - q$ from a package that contains y biscuits at price q. If families or singles don't buy a packet of biscuits they have zero utility.

(a) What conditions must (x, p) and (y, q) satisfy to ensure that families and singles buy biscuits and buy the packages the firm has designed for them?

(b) Show that if families don't want to buy the singles' package and the singles get positive utility from the singles' package, then families must get positive utility from their package. Then write down the 3 remaining constraints.

(c) Now suppose that p and q are increased together by the firm, what constraint starts to bind?

(d) Now suppose that q is increased alone by the firm, what constraint starts to bind?

(e) The firm's profits from selling the packages (x, p) and (y, q) are $\alpha(p - cx) + (1 - \alpha)(q - cy)$, where $\alpha > 0.5$. Use your answers to parts (B.I.3c) and (B.I.3d) of this question to write this as a function of p and q only.

(f) Hence solve for the optimal prices of these packages and interpret what you find.