MICROECONOMIC THEORY
PRACTICE SECOND MIDTERM

QUESTION 1

An agent has the following indirect utility function:

$$v(m) = \log(m)$$

where the functional dependence of $v(.)$ on p has been suppressed for notational simplicity.

The agent's current income is $10000 but there is a 25% chance that she will have to switch jobs, in which case her income will fall to $4096.

(a) Find the certainty-equivalent income level and the risk premium associated with this prospect.

(b) Suppose she can purchase insurance against this income fall at price r per dollar of coverage, q. What is the maximum total premium (calculated as rq) that she would be willing to pay for full insurance? Relate your answer to your answer to part (a).

QUESTION 2

(a) A consumer has the following intertemporal preferences:

$$u(c) = c_1^{1/2} + \beta c_2^{1/2}$$

She has income profile $\{y_1, y_2\}$, and can borrow and lend at interest rate r. Derive a necessary and sufficient condition on r under which she will be a lender in period 1.

(b) Consider the following production function:

$$f(x) = ax_1^{1/2} + bx_2^{1/2}$$

This production function exhibits DRS if and only if $a + b < 1$. True or false?

QUESTION 3

(a) A price-taking firm has the following production function:

$$f(x) = x_1^{1/2} + x_2^{1/2}$$

Derive the cost function and verify Shephard's lemma.

(b) A price-taking firm has the following production function:

$$f(x) = \log x_1 + x_2^{1/2}$$

Derive the profit function and verify Hotelling's lemma with respect to p.