NAME:_____

ECONOMICS 422
MIDTERM EXAM 1

R. W. Parks Summer1996

Answer all questions on the examination sheets. Weights are given in parentheses. In general you should try to show your work. If you only present a numerical answer and it is wrong, then you get no credit. If you show what you are doing and you make a numerical error you may receive some credit for a correct approach.

1.(25) Josephine lives in a two period Fisherian world. Her utility function for consumption streams can be written as $U(c_0, c_1) = c_0^2 c_1$, hence her marginal rate of substitution is $MRS = -2c_1 / c_0$.
Her endowment of present and future resources is (40000, 288400). She can borrow or lend at a market real interest rate of 3 percent.

a. What is her wealth?

b. Write the equation for her budget constraint.

c. Derive the marginal rate of substitution.

d. What is her optimal consumption in the present and in the future?

e. What financial transaction is required to attain the optimal consumption stream? Indicate what is exchanged for what, when, and indicate the amounts involved.

2. (25) The diagram of Figure 1 (attached) refers to a two period Fisherian model. Point E represents a person's initial endowment. The curve EDF represents all of the consumption streams that are attainable by real investment starting from E. The person can borrow or lend at the real rate of interest r. The slope of the line AB is -(1+r).

Instructions: Answer the questions below based on Figure 1, the above information, and the following convention. In Figure 1 treat each letter as indicating a *location* and not a quantity, so that in answering parts A and C of the question *you need to indicate quantities by two letters* such that the distance between them refers to the relevant quantity. For example, the endowment at point E involves the quantity OE of present resources.

In some instances, you may need to augment the diagram and to indicate points that are not yet labeled. In doing so, please use the letters M, N, P, Q, but not O (which is already used to indicate the origin.

A. Based on the diagram, please indicate:

(a.) the optimal amount of investment._____

(b.) the optimal consumption stream (show the amount of both present and future consumption._____

(c.) the attained wealth associated with the optimal investment._____

(d.) the attained wealth associated with investing an amount LE._____

(e.) the net present value associated with investing LE._____

B. What is the relation between the marginal rate of substitution at C, the marginal rate of transformation at D, and the real rate of interest?

_____

C. Indicate whether the person borrows or lends and how much. Indicate how much is repaid.

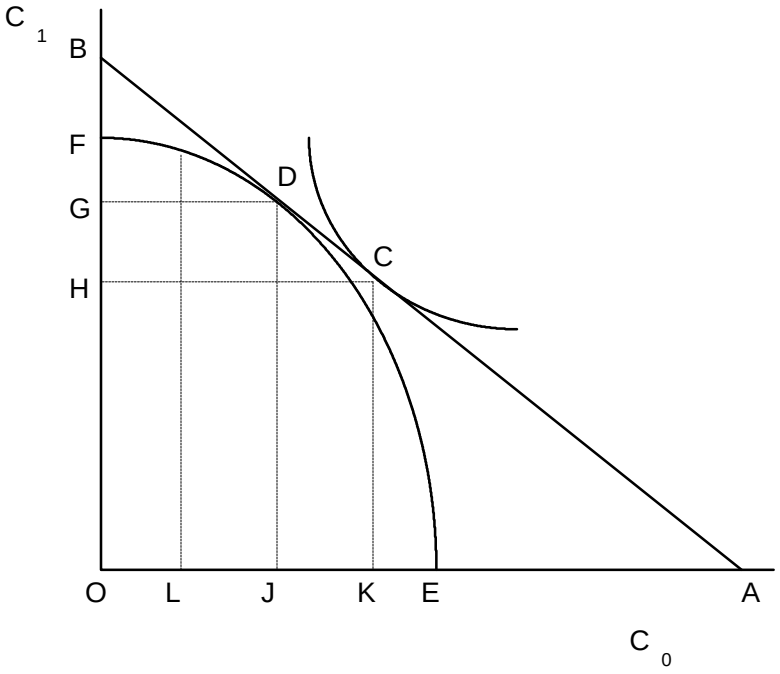
_____

D. If there is a rise in the real rate of interest, what happens to the optimal amount of real investment? _____

Show the new optimum in the diagram.

[Don't worry about optimal consumption.]

FIGURE 1



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3.(15) State the Fisher separation theorem.

Does it apply in the situation shown in problem 2? Explain.

Indicate a financial problem that is simplified or resolved if the theorem holds, at least approximately.

Indicate a situation in which the theorem would fail to hold.

4.(20) a. An asset will generate an income stream of $1,200 per year (starting in one year) for eight years. Its price is $6,200. If the interest rate is 10 percent, should you buy?

b. Peter Green bought a $15,000 Honda Civic with 20 percent down and financed the rest with a four year loan at an annual interest rate of 8 percent. What is his monthly payment if payments start one month after purchase?

c. A firm is expected to generate net cash flow of $10,000 at the end of the first year, and the cash flow is expected to grow at 3 percent per year. After 7 years the firm can be sold for $120,000. If the relevant discount rate is 11 percent what is the value of the firm?

5.(10) Yields and prices of zero coupon bonds.

a. A five year zero coupon (pure discount) bond sells for 72:24. What is its yield?

b. The yield on a four year zero coupon bond is 6.23 percent. What is its price?

6. (5) A person with endowment y_0, y_1 has a marginal rate of substitution of -1.5 at the endowment point. What is the least favorable market real interest rate that the person could face? Explain using the Fisher model.

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ECONOMICS 422
MIDTERM EXAM 2

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Answer all questions. Weights are given in parentheses. In general you should try to show your work. If you only present a numerical answer and it is wrong, then you get no credit. If you show what you are doing and you make a numerical error you will receive some credit for a correct approach.

1. (20) The following table gives the yields on four zero coupon Treasury bonds:

Maturity Date	Years from now	Yield
Jan 1997	0.5	5.41
July 1997	1.0	5.77
Jan 1998	1.5	6.07
July 1998	2.0	6.20

Note that the yields are annual yields, but they assume semi annual compounding.

a. What is the price of a two year, 6.0 percent coupon Treasury bond, paying semi-annual coupons?[Hint: Think term structure!]

b. Define the yield to maturity of a bond. Is the yield to maturity of the bond in part a higher of lower than the coupon rate? Explain.

c. Suppose that in 1994 you invest $10,000 in an asset and that in 1995, one year later, you invest another $5,000. At the present time, two years after the initial investment, the asset is worth $18,144. What has been your rate of return on the investment?

d. What is the July 1997 to July 1998 forward interest rate?

2. (16) The Sea Star Company has to choose between two machines which do the same job but have different lives: machine A provides service for three years, while machine B provides service for four years. The two machines have the following costs, expressed in real terms: (Neither has a scrap value at the end of its life.)

Year	Machine A	Machine B
0	$60,000	$75,000
1	$15,000	$12,000
2	$15,000	$12,000
3	$15,000	$12,000
4		$12,000

Assuming that the opportunity cost of capital is 6 percent in real terms and ignoring taxes, which machine would you choose? Explain and show your work.

3. (20) A person's utility of wealth function is $U(W)=\log_e(W)$, i.e. the person's utility associated with any given level of wealth is equal to the natural log of the wealth level. If the person chooses occupation A his or her wealth is given by the following wealth distribution:

Wealth:	1,400,000	2,400,000
Probability:	0.8	0.2

If the person chooses occupation B his or her wealth is given by the following wealth distribution:

Wealth:	1,500,000	1,700,000
Probability:	0.5	0.5

a. Which occupation will the person choose and why? Or will the person be indifferent to the alternatives? Explain.

b. Compute the certainty equivalent wealth for occupation B.

4. (16) Two companies have stock for which the expected returns and standard deviations of return are forecast as:

Company:	A	B
Expected Return:	0.20	0.20
Standard Deviation of Return	0.30	0.30

The correlation coefficient between the returns is 0.

a. What are the expected return and variance of returns for a portfolio made up, 60 percent of A and 40 percent of B?

b. Since the two stocks' returns and standard deviations are the same, does it make any sense to combine them in a portfolio, or would you be just as well off holding either one of the stocks separately? Explain.

5. (18) A stock currently sells for $100 per share. The distribution of its price in one year is:

Price:	90	100	110	120
Probability:	.10	.20	.50	.20

a. What is the probability distribution of the stock's rate of return?

b. Compute the expected value of the rate of return over the next year.

c. Compute the variance of the rate of return.

6. (10)

a. A share of Kayak Co. stock is expected to pay a dividend of $10 next year and dividends are expected to grow at 2 percent per year thereafter. Estimate the price of a share of Kayak Co.'s stock if the relevant discount rate is 15 percent.

b. Since I plan to hold XYZ's stock for at most five years, I am not concerned about XYZ's dividends after that horizon date. True, False or Uncertain. Explain

7. (20)Ms. Jenkins has invested 10 percent of her portfolio in shares of company A, 20 percent in those of company B, and the remainder in shares of C. She believes that their prospects are as follows:

Company:	A	B	C
Expected Return, %:	10	15	20

The matrix of their variances and covariances is given by:

	A	B	C
A	.0025	.0015	.0010
B	.0015	.0050	.0020
C	.0010	.0020	.0100

a.What are the expected return and standard deviation of returns on her portfolio?

b.Using the portfolio of part a, is Ms. Jenkins's portfolio better or worse than one invested entirely in shares of C, or is it impossible to say? Explain.

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Name:_____

ECONOMICS 422
FINAL EXAMINATION

R. W. Parks Summer 1996

Two hours. Answer all questions on these exam sheets. Question weights (total=120) are given in parentheses. In general you should try to show your work for the problems i.e. the non-multiple-choice questions. If you only present a numerical answer and it is wrong, then you get no credit. If you show what you are doing and you make a numerical error you will receive some credit for a correct approach.

1. (25) Concepts and Short problems:

a. The Fisher equation is:_____.

b. The distribution of a random variable:

c. The expected utility hypothesis:

d. Find the yield to maturity for a 1 year, 6 percent coupon bond, paying semiannual coupons if its price is 99:24. [Note the punctuation.]

e. Instead of liquidating your investment portfolio, you continue to manage it, and with your astute guidance, in 7.2 years it grows from $100,000 to $229,059.64. What is the average annual rate of return?_____

2. (15) Your company is considering a project which costs $1,600,000 now and is expected to generate net cash flows of $1,000,000 in real terms at the end of each of the next two years. The project has risk that is comparable to that of the company's current assets. The company has a debt/equity ratio of 0.5, and the beta for the company's stock is 2.0 while the beta for its debt is 0.5. Based on the monthly returns for five recent years, the standard deviation of the rate of return on the company's stock is 0.435 while that for the market portfolio is 0.2. The current risk-free interest rate is 6 percent, expected inflation over the next two years is 4 percent per year, and the expected market risk premium is 8 percent.

Would you advise adoption of the project? Explain and show your work.

3. (20) Efficient Market Hypothesis

a. State the efficient market hypothesis.

b. Describe the logic of and the results of a test for the weak form of the efficient market hypothesis.

c. Analysis of past monthly movements in Pillsbury's stock returns produces the following estimates: α=1.65 percent and β=0.6. If in a subsequent month the market index return is 8 percent while Pillsbury's stock return is 7 percent, what is the abnormal return for Pillsbury?

d. You have been asked to evaluate the performance of 10 money managers (or mutual fund managers) over the last 3 years. Explain what measures you would use to judge them.

4.(5) You sold short 100 shares of XYZ Corp. on a day when the shares' price is $120. On a subsequent "date A" the price of XYZ was $140, and on a different subsequent "date B" the price of XYZ was $105. On one of these two dates, A or B, the date on which is was more advantageous to do so, you traded to close the short position. What was your profit or loss?_____

5. (15) BioGenCo's stock sells for $172. It has a beta of 1.2, the standard deviation of the rate of return is 0.4, and it has not paid dividends. The risk free interest rate is 5.5 percent. Find the value of a one year European put option on BioGenCo with an exercise price of $165. Would an American put option be worth more or less? Why?

6. (20)A firm has assets with a market value of $10,000,000. The standard deviation of the rate of return on these assets is 0.4. The firm has debt in the form of a zero coupon bonds, maturing in 4 years. The present value of the payment promised at the bonds' maturity, using an annually compounded risk-free interest rate of 6 percent is $5,000,000.

a. Find the future value of the promised debt payment.

b. Find the market value of the firm's equity.

c. Find the market value of the debt. Is the debt risky or riskfree?

d. What is the yield to maturity on the bonds?

7. (5) The closing price on the 100 ounce gold futures contract for September (treat this as 0.333 years from now) was $383.20 per ounce. The closing spot price of gold was $378.20 per ounce. The September T-bill has a yield of 6.06 percent. If the convenience yield for gold is negligible and if the present value of the cost of storing an ounce of gold for four months is positive, are the spot and futures prices consistent? Explain. If you find that the prices are not consistent, explain how you could take advantage of the situation.

8.(10) Option traders often refer to straddles and butterflies. Here is an example of each:
Straddle: Buy a call with an exercise price of $100 and simultaneously buy a put with an exercise price of $100.
Butterfly: Simultaneously buy one call with an exercise price of $100, sell two calls with an exercise price of $110, and buy one call with an exercise price of $120.

Draw position diagrams for the straddle and for the butterfly, showing the payoff at expiration from the investor's net position. Each strategy is a bet on variability. Explain briefly the nature of the bet.

9. (5) You observe the following interest rates:

$_0r_{.5}$ .045

$_0r_1$ .050

What is the price of a one year bond, with a 6 percent coupon, paying interest semiannually?

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