

## Exam Extra practices

1. Eighteen years from now, 4 years of college are expected to cost \$150,000.

Required:

- a) How much must be deposited into an account today to fund this expense if you could earn 11% on your savings? (5 points)
- b) How much more must be deposited into an account today to fund this expense if you could only earn 8% rather than the 11% you had hoped to earn on your savings?

2. Lester's just signed a contract that will provide the firm with annual cash inflows of \$28,000, \$35,000, and \$42,000 over the next three years with the first payment of \$28,000 occurring one year from today.

Required: What is this contract worth today at a discount rate of 7.25%?

3. Would you prefer a savings account that paid 7% interest compounded quarterly, 6.8% compounded monthly, 7.2% compounded weekly, or an account that paid 7.5% with annual compounding?

4. A couple will retire in 25 years; they plan to spend about \$40,000 a year in retirement, which should last about 30 years. The APR is 6%.

- a. If they make annual payments into a savings plan, how much will they need to save each year?

5. Today you buy a 10% coupon, 10-year maturity bond when its yield to maturity is 7%.

- a. Without making any calculations, tell whether the bond is trading at a discount or at a premium today. Explain your answer.

- b. Calculate the price of the bond today.

- c. What is the current yield of the bond?

- d. What do you expect, if everything stays the same, is the price of the bond going to increase or decrease next year? Explain your answer.

Assume that a year later the company is facing financial difficulties and the yield to maturity increases to 10.5%.

- e. Without making any calculations, tell what is going to happen to the price of the bond in this case? Explain your answer.

- f. What is your rate of return over the year given the increase of YTM? Explain your result.

6. You invested \$1,500 three years ago. During the three years, you earned annual rates of return of 3.8%, 8.6%, and 12.1%. What is the value of this investment today?

7. 1. If Bob and Judy combine their savings of \$1,260 and \$975, respectively, and deposit this amount into an account that pays 2% annual interest, compounded monthly, what will the account balance be after 4 years?

8. Gabrielle just won \$2.5 million in the state lottery. She is given the option of receiving a total of \$1.3 million now, or she can elect to be paid \$100,000 at the end of each of the next 25 years. If Gabrielle can earn 5% annually on her investments, from a strict economic point of view which option should she take?

9. Joseph is a friend of yours. He has plenty of money but little financial sense. He received a gift of \$12,000 for his recent graduation and is looking for a bank in which to deposit the funds. Partners' Savings Bank offers an account with an annual interest rate of 3%

compounded semiannually, whereas Selwyn's offers an account with a 2.75% annual interest rate compounded continuously. Calculate the value of the two accounts at the end of 1 year, and recommend to Joseph which account he should choose.

10. Jack and Jill have just had their first child. If college is expected to cost \$150,000 per year in 18 years, how much should the couple begin depositing annually at the end of each year to accumulate enough funds to pay the first year's tuition at the beginning of the nineteenth year? Assume that they can earn a 6% annual rate of return on their investment.

11. You can deposit \$10,000 into an account paying 9% annual interest either today or exactly 10 years from today. How much better off will you be at the end of 40 years if you decide to make the initial deposit today rather than 10 years from today?

12.

Case	Amount of annuity	Interest rate	Deposit period (years)
A	\$2,500	8%	10
B	\$500	12%	6
C	\$30,000	20%	5
D	\$11,500	9%	8
E	\$6,000	14%	30

a. Calculate the future value of the annuity, assuming that it is

(1) An ordinary annuity.

(2) An annuity due.

b. Compare your findings in parts a(1) and a(2). All else being identical, which type of annuity—ordinary or annuity due—is preferable? Explain why.

13. You plan to retire in exactly 20 years. Your goal is to create a fund that will allow you to receive \$20,000 at the end of each year for the 30 years between retirement and death (a psychic told you that you would die exactly 30 years after you retire). You know that you will be able to earn 11% per year during the 30-year retirement period.

a. How large a fund will you need when you retire in 20 years to provide the 30-year, \$20,000 retirement annuity?

b. How much will you need today as a single amount to provide the fund calculated in part a if you earn only 9% per year during the 20 years preceding retirement?

c. What effect would an increase in the rate you can earn both during and prior to retirement have on the values found in parts a and b? Explain.

d. Now assume that you will earn 10% from now through the end of your retirement. You want to make 20 end-of-year deposits into your retirement account that will fund the 30-year stream of \$20,000 annual annuity payments. How large do your annual deposits have to be?

14. Aunt Tillie has deposited \$33,000 today in an account which will earn 10 percent annually. She plans to leave the funds in this account for seven years earning interest. If the goal of this deposit is to cover a future obligation of \$65,000, what recommendation would you make to Aunt Tillie?

15. Simpson, Inc. is considering a five-year project that has an initial after-tax cost of \$80,000. The respective future cash inflows from its project for years 1, 2, 3, 4 and 5 are: \$15,000, \$25,000, \$35,000, \$45,000 and \$55,000. Simpson uses the net present value method and has a discount rate of 9%.

- a. Will Simpson accept the project?
- b. How would your answer change if the initial after-cost was \$130,000?

16. Using a 14% cost of capital, calculate the net present value for each of the independent projects shown in the following table, and indicate whether each is acceptable.

Which project (or projects) would you accept based on the payback period rule if the cut-off period is 5 years?

	Project A	Project B	Project C	Project D	Project E
Initial investment ( $CF_0$ )	\$26,000	\$500,000	\$170,000	\$950,000	\$80,000
Year ( $t$ )	Cash inflows ( $CF_t$ )				
1	\$4,000	\$100,000	\$20,000	\$230,000	\$ 0
2	4,000	120,000	19,000	230,000	0
3	4,000	140,000	18,000	230,000	0
4	4,000	160,000	17,000	230,000	20,000
5	4,000	180,000	16,000	230,000	30,000
6	4,000	200,000	15,000	230,000	0
7	4,000		14,000	230,000	50,000
8	4,000		13,000	230,000	60,000
9	4,000		12,000		70,000
10	4,000		11,000		