SMN224 - Tutorial assignment for topic 3

Topic 3: Discounting cash flows, annuities, perpetuities and interest rates

1. You are comparing two investment options. The cost to invest in either option is the same today. Both options will provide you with £20,000 of income. Option A pays five annual payments starting with £8,000 the first year followed by four annual payments of £3,000 each. Option B pays five annual payments of £4,000 each. Which one of the following statements is correct given these two investment options?

A. Both options are of equal value given that they both provide £20,000 of income.
B. Option A is the better choice of the two given any positive rate of return.
C. Option B has a higher present value than option A given a positive rate of return.
D. Option B has a lower future value at year 5 than option A given a zero rate of return.
E. Option A is preferable because it is an annuity due.

2. You are considering two projects with the following cash flows:

	Project A	Project B
Year 1	£2,500	£4,000
Year 2	3,000	3,500
Year 3	3,500	3,000
Year 4	4,000	2,500

Which of the following statements are true concerning these two projects?
(I) Both projects have the same future value at the end of year 4, given a positive rate of return.
(II) Both projects have the same future value given a zero rate of return.
(III) Both projects have the same future value at any point in time, given a positive rate of return.
(IV) Project A has a higher future value than project B, given a positive rate of return.

A. II only
B. IV only
C. I and III only
D. II and IV only
E. I, II, and III only

3. Which of the following statements concerning the effective annual rate are correct?
   (I) When making financial decisions, you should compare effective annual rates rather than annual percentage rates.
   (II) The more frequently interest is compounded, the higher the effective annual rate.
   (III) A quoted rate of 6% compounded continuously has a higher effective annual rate than if the rate were compounded daily.
   (IV) When borrowing and choosing which loan to accept, you should select the offer with the highest effective annual rate.

A. I and II only
B. I and IV only
C. I, II, and III only
D. II, III, and IV only
E. I, II, III,and IV

4. What is the future value of the following cash flows at the end of year 3 if the interest rate is 9%? The cash flows occur at the end of each year.

Year 1	Year 2	Year 3
£9,820	£0	£4,510

A. £15,213.80
B. £15,619.70
C. £15,916.78
D. £16,177.14
E. £17,633.08

5. Elizabeth is going to receive £10,000 today as the result of an insurance settlement. In addition, she will receive £15,000 one year from today and £25,000 two years from today. She plans on saving all of this money and investing it for her retirement. If Suzette can earn an average of 11% on her investments, how much will she have in her account if she retires 25 years from today?
   A. £536,124.93
   B. £541,414.14
   C. £546,072.91
   D. £570,008.77
   E. £595,098.67

6. The Jeeves building society just decided to save £1,500 a month for the next five years as a safety net for recessionary periods. The money will be set aside in a separate savings account which pays 3.25% interest compounded monthly. It deposits the first £1,500 today. If the company had wanted to deposit an equivalent lump sum today, how much would it have had to deposit?
   A. £82,964.59
   B. £83,189.29
   C. £83,428.87
   D. £83,687.23
   E. £84,998.01

7. A financial product promises to pay the buyer £75 per year indefinitely. The market rate of interest for these types of payments is 8%. The price you would pay for this financial product is:
   A. £ 9.375
   B. £ 81.00
   C. £ 93.75.
   D. £937.50.
   E. None of the above.

8. You would like to establish a trust fund that will provide £50,000 a year forever for your heirs. The trust fund is going to be invested very conservatively so the expected rate of return is only 2.75%. How much money must you deposit today to fund this gift for your heirs?
   A. £1,333,333.33
   B. £1,375,000.00
   C. £1,425,000.00
   D. £1,666,666.67
   E. £1,818,181.82

9. What is the present value of 10 annual payments of £500 at a discount rate of 12%?
   A. £1,332
   B. £1,761
   C. £1,840
   D. £2,825
   E. £3,040

10. What is the effective annual rate if a bank charges you 7.64% compounded quarterly?
    A. 7.79%
    B. 7.86%
    C. 7.95%
    D. 7.98%
    E. 8.01%

11. Your credit card company quotes you a rate of 14.9%. Interest is billed monthly. What is the actual rate of interest you are paying?
    A. 13.97%
    B. 14.90%
    C. 15.48%
    D. 15.96%
    E. 16.10%

12. What is the net present value of a project with the following cash flows and a required return of 12%?

Year	Cash flow
0	-£28,900
1	£12,450
2	£19,630
3	£2,750

A. -£287.22
B. -£177.62
C. £177.62
D. £204.36
E. £287.22

13. You are considering the following two mutually exclusive projects that will not be repeated. The required rate of return is 11.25% for project A and 10.75% for project B. Which project should you accept and why?

Year	Project A	Project B
0	-£48,000	-£126,900
1	£18,400	£69,700
2	£31,300	£80,900
3	£11,700	£0

A. project A; because its NPV is about £335 more than the NPV of project B
B. project A; because it has the higher required rate of return
C. project B; because it has the largest total cash inflow
D. project B; because it returns all its cash flows within two years
E. project B; because it is the largest sized project

14. You are considering two mutually exclusive projects with the following cash flows. Will your choice between the two projects differ if the required rate of return is 8% rather than 11% ? If so, what should you do?

Year	Project A	Project B
0	-£240,000	-£198,000
1	£0	£110,800
2	£0	£82,500
3	£325,000	£45,000

A. yes; Select A at 8% and B at 11%.
B. yes; Select B at 8% and A at 11%.
C. yes; Select A at 8% and select neither at 11%.
D. no; Regardless of the required rate, project A always has the higher NPV.
E. no; Regardless of the required rate, project B always has the higher NPV.

15. 2015 Exam Q3.1
You have been hired to run the pension fund for a small company with five employees. You estimate, based upon their ages and retirement schedules, that your liabilities under the plan will be as follows:

Years	Expected cash payments
6-10	£100,000
11-20	£250,000
21-25	£100,000

You currently have £500,000 in investments in the plan. You want to fully fund all your above-listed liabilities by the end of year 5. How much would you have to set aside each year for the next five years to ensure this, if your opportunity cost is 8%?