

Towson University  
Department of Finance  
Fin331  
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NAME: \_\_\_\_\_  
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1. If APR = 10%, what is the EAR (effective annual rate) for quarterly compounding?
- a. 10.00%
  - b. 10.38%
  - c. 12.36%
  - d. 13.36%
  - e. 15.52%

**Answer: b**

APR = Nominal rate	10.00%
Periods/yr	4
$EFF\% = (1 + (r_{NOM}/N))^N - 1 =$	10.38%

2. If the current one year CD rate is 3% and the best estimate of one year CD which will be available one year from today is 5%, what is the current two year CD rate with 1% liquidity premium?
- a. 4.0%
  - b. 4.5%
  - c. 5.0%
  - d. 5.5%
  - e. 6.0%

**Answer: C**

$$(1 + {}_0R_2 - 0.01)^2 = (1.03)^1 \times (1.05)^1$$
$${}_0R_2 = \{(1.03) \times (1.05)\}^{1/2} + 0.01 - 1 = 4.9952\% \approx 5.00\%$$

3. Which of the following statements is CORRECT, assuming positive interest rates and holding other things constant?
- a. The present value of a 5-year, \$250 annuity due will be lower than the PV of a similar ordinary annuity.
  - b. A 30-year, \$150,000 amortized mortgage will have larger monthly payments than an otherwise similar 20-year mortgage.
  - c. A bank loan's nominal interest rate will always be equal to or greater than its effective annual rate.
  - d. If an investment pays 10% interest, compounded quarterly, its effective annual rate will be greater than 10%.
  - e. Banks A and B offer the same nominal annual rate of interest, but A pays interest quarterly and B pays semiannually. Deposits in Bank B will provide the higher future value if you leave your funds on deposit.

**Answer: d**

4. You have a chance to buy an annuity that pays \$550 at the beginning of each year for 3 years. You could earn 5.5% on your money in other investments with equal risk. What is the most you should pay for the annuity?
- a. \$1,412.84

- b. \$1,487.20
- c. \$1,565.48
- d. \$1,643.75
- e. \$1,725.94

**Answer: c**

BEGIN Mode

N	3
I/YR	5.5%
PMT	\$550
FV	\$0.00
PV	-\$1,565.48

Therefore, to receive \$550 at the beginning of each year for 3 years at 5.5%, the fair value you should pay is \$1,565.48

5. Your aunt has \$500,000 invested at 5.5%, and she now wants to retire. She wants to withdraw \$45,000 at the beginning of each year, beginning immediately. She also wants to have \$50,000 left to give you when she ceases to withdraw funds from the account. For how many years can she make the \$45,000 withdrawals and still have \$50,000 left in the end?

- a. 15.54
- b. 16.36
- c. 17.22
- d. 18.08
- e. 18.99

**Answer: a or c**

BEGIN Mode

I/Y	5.50%	or	I/Y	5.50%
PV	-\$500,000		PV	-\$500,000
PMT	\$45,000		PMT	\$45,000
FV	\$50,000		FV	-\$50,000
N	15.05		N	17.22

Depending on how you consider the inflow and outflow of the cash flows, the answer can be a or c. 15.05 years is the correct answer (a is closest), but c is counted as the correct answer as well.

6. How much do you need to save each year from two years from today and onward so that you can have \$1,000 six years from today at 10% interest rate?

- a. \$150
- b. \$164
- c. \$173
- d. \$183
- e. \$190

**Answer: b**

$N=5, I/Y=10, FV=1,000 \Rightarrow PMT = -163.80$

7. Jennifer can make a 100,000 down payment to buy a house. The house is \$380,000 and she was offered 30-year mortgage and 15-year mortgage at a market rate of 12%. How much more interest would Jennifer pay if she took out a 30-year mortgage instead 15-year mortgage?

- a. \$106,430
- b. \$413,957
- c. \$431,959

- d. \$450,790
- e. \$490,250

**Answer: c**

For 30 years:  $N=30*12=360$ ,  $I=1\%$ ,  $PV= -(380,000-100,000) \Rightarrow PMT=2,880.12$

$$INT = (2,880.12*360) - 280,000 = 756,843.20$$

For 15 years:  $N=15*12=180$ ,  $I=1\%$ ,  $PV= -(380,000-100,000) \Rightarrow PMT=3,360.47$

$$INT = (3,360.47*180) - 280,000 = 324,884.60$$

Therefore, the difference in the interests is  $756,843.20 - 324,884.60 = 431,958.60$

8. How long will it take for you to pay off \$1,500 charged on your credit card, if you plan to make the minimum payment of \$50 per month and the credit card charges 24% per annum?

- a. 10 months
- b. 35 months
- c. 10 years
- d. 863 months
- e. You may not be able to pay off the debt

**Answer: e**

$I = 2$ ,  $PV = -1500$ ,  $PMT = 20 \Rightarrow N = ?$  Error 5 is "No solution exists" in the Texas Instrument BA II Plus calculator

9. 5-year Treasury bonds yield 5.5%. The inflation premium (IP) is 1.9%, and the maturity risk premium (MRP) on 5-year T-bonds is 0.4%. There is no liquidity premium on these bonds. What is the real risk-free rate,  $r^*$ ?

- a. 2.59%
- b. 2.88%
- c. 3.20%
- d. 3.52%
- e. 3.87%

**Answer: c**

Basic equation:  $r = r^* + IP + MRP + DRP + LP$

$r_{T\text{-bond}}$	5.50%
IP	1.90%
MRP	0.40%
LP and DRP	0.00%
$r^* = r_{T\text{-bond}} - IP - MRP$	3.20%

10. Suppose the interest rate on a 1-year T-bond is 5.0% and that on a 2-year T-bond is 7.0%. Assuming the pure expectations theory is correct, what is the market's forecast for 1-year rates 1 year from now?

- a. 7.36%
- b. 7.75%
- c. 8.16%
- d. 8.59%
- e. 9.04%

**Answer: e**

1-year rate today	5.00%
2-year rate today	7.00%
Maturity of longer bond	2
Ending return if buy the 2-year bond = needed return on series of 1-year bonds	1.1449
Rate of return, or yield, on a 1-year bond 1 year from now:	X in this equation: $(1.05)(1 + X) = 1.1449$