Financial Functions Fall Final Practice Test #C Annotated Answers

REMEMBER: Ignore negatives and round ansers to the nearest dollar; will explain why in subsequent weeks.
If you understand these problems, you'll do great on the midterm.

#1 Output = PMT ". . .must be saved each year . . ." **NOTICE: EACH YEAR = PMT**

($10,901)

Inputs: FV = $1,250,000 ("savings goal"); n = 30 (55 - 25); PV = $9,000 ("one credit card debt of");
rate = 8.5%. **NOTICE: "Debt" input as positive $9,000.**

#2A BOTH Output = PV "Present Value of Option One"

OPTION ONE Inputs: PMT = $50,000 ("per year"); n = 10; rate = 6.5% **NOTICE: PER year = PMT**

($359,442)

#2B

OPTION TWO Inputs: FV = $670,000 "lump sum in 12 years"; n =12; rate = 6.5%

($314,688)

#2C **OPTION ONE HAS A HIGHER PRESENT VALUE & IS THE BEST OPTION.**

#3 Output = PV "how much should an investor pay" **NOTE: INVESTMENT VALUES = PV**

($43,384)

Inputs: FV = $60,000 (face value); PMT = $2,300 per year; rate = 7%; n = 14 years.

#4 Output = FV "how much will have been saved at retirement" **NOTICE: PER year = PMT**

($665,476)

Inputs: n = 40 (70-30); PMT = $4,300 ("per year"); rate = 6% PV = 0 ("no savings or debt")

#5 Output = PMT "monthly payment" **REMEMBER: FOR ALL LOANS, DO MONTHLY**

($2,559)

Inputs: PV = $470,000 (loan amount); rate = 4.3%/12; n = 25*12

#6 Output = PV "how much should an investor pay" **NOTE: INVESTMENT VALUES = PV**

($8,621)

Inputs: FV = $20,000 (face value); rate = 5.4%; n = 16 years

#7 Output = FV "will have been saved at retirement"

($1,897,384)

Inputs: PMT = $4,500 ("per year"); PV = $12,000 ("current savings"); rate = 9%; n = 40 (65 - 25)

#8 Output = PMT ("must be saved each year") **NOTICE: EACH YEAR = PMT**

($4,060)

Inputs: FV = $1,000,000 ("savings goal"); rate = 6.5%; n = 45 (65-20)

#9 Output = PV "how much can you borrow", loan amount

($369,466)

Inputs: PMT = $129,000 per year * 27% / 12; **NOTE: *27% allocates annual income to annual payment**

rate = 4.9%/12; n = 15*12 **Dividing by 12 converts annual payment to monthly payment**

#10

One Bedroom Unit Monthly Rent =	$800	**X 8 units X 12 months (1st Year Income For One Bedroom Units)**
Two Bedroom Unit Monthly Rent =	$2,000	**X 6 units X 12 months (1st Year Income For Two Bedroom Units)**

	Year 1	Year 2	Year 3	Year 4	
Annual Gross Income					
One Bedroom Units	$76,800	$82,944	$89,580	**$96,746**	**Increase each year gross income 8% by multiplying by 1.08**
Two Bedroom Units	$144,000	$155,520	$167,962	**$181,399**	**Increase each year gross income 8% by multiplying by 1.08**
Total Annual Gross Income	$220,800	$238,464	$257,541	**$278,144**	**Add Gross Income Figures for One & Two Bedroom Units**
Vacancy & Collection Loss (6%)	$13,248	$14,308	$15,452	**$16,689**	**Multiply each year annual gross income by 6%**
Annual Effective Gross Income	$207,552	$224,156	$242,089	**$261,456**	**Subtract vacancy figure from annual gross income for each year**
Annual Expenses	$75,000	$78,750	$82,688	**$86,822**	**Increase each year expenses 5% by multiplying by 1.05**
Annual Net Income	$132,552	$145,406	$159,401	**$174,634**	**Subtract expenses from effective gross income for each year**

#11 **Use the four net annual income figures for years one, two, three and four.**

Year One	**Year Two**	**Year Three**	**Year Four**	
$132,552	$145,406	$159,401	$174,634	
Add Property Sale Price To Year 4			**$1,450,000**	**4th year annual net income of $792,059 +**
$132,552	$145,406	$159,401	$1,624,634	**$1,450,000 proceeds of sale = $2,242,059**

Output = NPV ("net present value")

$1,470,079 Rate = 10%

#12 **Note: Before the clock starts (time 0), you buy the property for $1,630,000. Input the purchase price as a negative number, $ going out of your pocket. Use the same figures as used in #11 and put a year zero in front with the purchase price input as a negative.**

Year Zero	**Year One**	**Year Two**	**Year Three**	**Year Four**	
-$1,630,000	$132,552	$145,406	$159,401	$1,624,634	**BE SURE TO ROUND % ANSWER TO NEAREST TENTH**

Output = IRR ("internal rate of return") **NO input required for "Guess" in function box.**

6.8%

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#BONUS **One Bedroom Unit Monthly Rent =** $600 **X 8 units X 12 months (1st Year Income For One Bedroom Units)**

Two Bedroom Unit Monthly Rent = $2,200 **X 6 units X 12 months (1st Year Income For Two Bedroom Units)**

	Year 1	Year 2	Year 3	Year 4	
Annual Gross Income					
One Bedroom Units	$57,600	$62,208	$67,185	**$72,559**	**Increase each year gross income 8% by multiplying by 1.08**
Two Bedroom Units	$158,400	$171,072	$184,758	**$199,538**	**Increase each year gross income 8% by multiplying by 1.08**
Total Annual Gross Income	$216,000	$233,280	$251,942	**$272,098**	**Add Gross Income Figures for One & Two Bedroom Units**
Vacancy & Collection Loss (6%)	$12,960	$13,997	$15,117	**$16,326**	**Multiply each year annual gross income by 6%**
Annual Effective Gross Income	$203,040	$219,283	$236,826	**$255,772**	**Subtract vacancy figure from annual gross income for each year**
Annual Expenses	$75,000	$78,750	$82,688	**$86,822**	**Increase each year expenses 5% by multiplying by 1.05**
Annual Net Income	$128,040	$140,533	$154,138	**$168,950**	**Subtract expenses from effective gross income for each year**

Use the four net annual income figures for years one, two, three and four.

	Year One	Year Two	Year Three	Year Four
	$128,040	$140,533	$154,138	$168,950
Add Property Sale Price To Year 4				**$1,450,000**
	$128,040	$140,533	$154,138	$1,618,950

NET PRESENT VALUE = **$1,454,114**

Determine the property values ("outcome values") for each of the six possible combinations of rent. Output = NPV ("net present value") Rate = 10%
Calculations use Net Present Value function (see #11 above). Find the probability of each outcome using the multiplication rule.

Outcome Value Assuming:			**P (X,Y)**		**PRODUCT OF PROBABILITY * OUTCOME**
One Bedroom = $600 & Two Bedroom = $2,000	**$1,406,219**	*	**3.0%**	=	**$42,187**
One Bedroom = $800 & Two Bedroom = $2,000	**$1,470,079**	*	**12.0%**	=	**$176,409**
One Bedroom = $1,000 & Two Bedroom = $2,000	**$1,533,940**	*	**15.0%**	=	**$230,091**
One Bedroom = $600 & Two Bedroom = $2,200	**$1,454,114**	*	**7.0%**	=	**$101,788**
One Bedroom = $800 & Two Bedroom = $2,200	**$1,517,975**	*	**28.0%**	=	**$425,033**
One Bedroom = $1,000 & Two Bedroom = $2,200	**$1,581,836**	*	**35.0%**	=	**$553,643**

ADD UP THE PRODUCTS TO FIND THE "EXPECTED VALUE FOR THIS PROPERY" **$1,529,151**

100.0%

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