Senior High School

General Mathematics

Module 12:
Fair Market Value of a Cash Flow Stream and Deferred Annuity

AIRs - LM

GENERAL MATHEMATICS
Module 12: Fair Market Value of a Cash Flow Stream and Deferred Annuity
Second Edition, 2021

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Senior High School

General Mathematics
Module 12:
Fair Market Value of a Cash Flow Stream and Deferred Annuity

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

Target

Annuity is a series of equal payments or withdrawals in the same period of time. Let's say you want to save money to go on a vacation. The savings you did is an example of annuity where you save a certain amount of money for a period of time.

In your previous lesson, you are done finding for the future value and present value of both simple annuities and general annuities.

This learning material will provide you with information and activities that will help you understand and calculate the fair market value of a cash flow stream that includes an annuity and the present value and period of deferral of a deferred annuity.

After going through this module, you are expected to:

1. calculate the fair market value of a cash flow stream that includes an annuity **(M11GM-IId-2)**; and
2. calculate the present value and period of deferral of a deferred annuity. **(M11GM-IId-3)**

Learning Objectives:

1. define fair market value and cash flow.
2. describe deferred annuity, and period of deferral.
3. solve the fair market value of a cash flow stream that includes an annuity and the present value and period of deferral of a deferred annuity.

Before going on, check how much you know about this topic. Answer the pretest on the next page in a separate sheet of paper.

Pretest

Directions: Read each item carefully and select the correct answer. Write the letter of your choice in separate sheet of paper.

1. Which of the following refers to the amount of each payment in an annuity?
   A. Annuity Due B. Future Value
   C. Present Value D. Regular or Periodic Payment

2. What term refers to the payments received or payments or deposits made?
   A. Annuity B. Cash Flow
   C. Interest D. Periodic Payment
3. Which annuity is being described if payments are done at some later period of time?
   A. Annuity Due B. Deferred Annuity
   C. General Annuity D. Ordinary Annuity

4. Which of the following terms refers to the selling price of any property where the buyer and the seller made an agreement?
   A. Annuity B. Fair Market Value
   C. Periodic Interest D. Periodic Payment

5. What type of annuity is being described when the payments are made at the end of each period?
   A. Annuity Due B. Deferred Annuity
   C. General Annuity D. Ordinary Annuity

6. What term refers to the time between the purchase of an annuity and the start of the payments for the deferred annuity?
   A. Annuity B. Fair Market Value
   C. Period of Deferral D. Periodic Payment

7. What type of annuity is used in life insurances such as Sunlife Corporation and pension payment?
   A. Deferred Annuity B. Simple Annuity
   C. Ordinary Annuity D. General Annuity

8. What is the period of deferral in the problem "Monthly payments of ₱10,000 for 8 years that will start 6 months from now"?
   A. 5 B. 6 C. 7 D. 8

9. What is the period of deferral for a loan that pays ₱ 5000 every 6 months for 9 years that will start 4 years from now?
   A. 6 B. 7 C. 8 D. 9

10. What is the period of deferral in the problem "Annual payments of P3,000 for 10 years that will start 5 years from now"?
   A. 4 B. 5 C. 6 D. 7

11. In the deferred annuity problem, "Quarterly payments of ₱ 5,000 for 8 years that will start two years from now", what is the period of deferral?
   A. 4 B. 5 C. 6 D. 7

12. Fair market value is computed by adding the down payment and present value. If the down payment for a car is ₱ 50,000.00 and the present value is ₱ 783, 526.20. How much is the fair market value?
   A. ₱ 823, 516. 20 B. ₱ 823, 526. 20
   C. ₱ 833, 526. 20 D. ₱ 833, 566. 20

13. How much is the fair market value of a lot if the present value three years from now is ₱ 150,000.00 and the down payment is ₱ 55,000.00?
   A. ₱ 50,000.00 B. ₱ 150,000.00
   C. ₱ 205,000.00 D. ₱ 255,000.00

14. Janine availed of a cash loan that gave her an option to pay 10,000 monthly for 1 year. The first payment is due after 6 months. How much is the present value of the loan if the interest rate is 12% converted monthly?
   A. ₱ 107,088.20 B. ₱ 107,089.20
   C. ₱ 107,098.20 D. ₱ 107,099.20

15. Joy bought the car of her mother which she will pay ₱ 10,000.00 per quarter for 10 years after being deferred for 5 years with the interest rate of 6% compounded quarterly. What is the present value of this annuity?
   A. ₱ 222,116.30 B. ₱ 223,116.30
   C. ₱ 224,116.30 D. ₱ 225,116.30

Jumpstart

For you to understand the lesson well, do the following activities.
Have fun and good luck!

Activity 1: Fact or Bluff!

Directions: Read the given information about cash flow and fair market value in the table. Understand what you are reading, then accomplish the given activity below.

Terms	**Definition**
Fair Market Value	It is the selling price of any property where the buyer and the seller made an agreement.
Annuity	It is a series of equal payments or withdrawals in the same period of time.
Present Value of an annuity	It refers to the amount of money needed to invest in order to receive a series of payments for a period of time.
Term of annuity	It is the time from the start of the first payment until the end of the last payment period.
Cash Flow	It is a term that refers to payments received (cash inflows) or payments or deposits made (cash outflows).
Deferred Annuity	It is a type of annuity that does not begin until a given time interval has passed or payments are done at some later date of a period of time.
Period of Deferral	This refers to time between the purchase of an annuity and the start of the payments for the deferred annuity.

Directions: Identify whether the given statement is a fact or a bluff. Write the word "FACT" if the statement is correct and "BLUFF" if it is not.

1. Cash inflow refers to the payments being received by a person.
2. Future value of annuity refers to the amount of money needed to invest in order to receive a series of payments for a period of time.
3. Annuity is a series of unequal payments or withdrawals in the same period of time.
4. Term of annuity refers to the time from the start of the first payment until the end of the last payment period.
5. Payments or deposits made by a person is called "cash outflow".

Activity 2: Complete Me!

Directions: Read and analyze the given problem, then complete the table below. Use a separate sheet of paper for your answers.

Juana applied for a loan of ₱ 50,000. It will be repaid monthly for 5 years that will start at the end of 4 years. If interest rate is 12% converted monthly, how much is the monthly payment?

Question	Answer
1. What type of annuity is illustrated in the problem?	
2. What is the total number of payments?	
3. What is the number of conversion periods in the period of deferral?	
4. What is the interest rate per period?	
5. What is the present value of the loan?	

Discover

Fair Market Value of Cash Flow Steam that includes an Annuity

A **cash flow** refers to any type of payments done. Cash inflow happens when a person receives the payment and a cash outflow are payments or deposits made by a person. Cash inflows can be represented by positive numbers and cash outflows can be represented by negative numbers.

Fair market value (**FMV**) is the price that two parties are willing to pay for an asset or liability, given the following conditions:

- Both parties are well informed about the condition of the asset or liability.
- Neither party is under undue pressure to buy or sell the item.
- There is no time pressure to complete the deal.

The fair market value concept is used for many purposes, including the following:

- Establishing the replacement value of an insured asset;
- Establishing the tax basis upon which property will be assigned a property tax; and
- Establishing the basis for damages in a court award.

The fair market value or economic value of a cash flow (payment stream) on a particular date refers to a single amount that is equivalent to the value of the payment stream at that date. This particular date is called the **focal date**.

Fair Market Value is computed by adding the Down payment and Present Value or "**Fair Market Value (FMV) = Down payment + Present Value**".

In computing for the present value of the given problem, the formula to be used are the following:

A. Simple Annuity – the payment interval is the same as the interest period

$$\mathbf{P = F\,(1 + j)^{-n}}$$

where F - is the future value

j - interest rate per period and is given by the formula, $j = \frac{r}{m}$ where r is the annual interest rate and m is the number of compounds.

Note: annually ***(m =1)***	quarterly ***(m =4)***
semi-annually ***(m =2)***	monthly ***(m =12)***

n - number of actual payments and is given by the formula, $n = mt$ where m is the number of compounds and t is time express in years.

B. General Annuity- the payment interval is not the same as the interest period

$$\mathbf{P = R\,\frac{1 - (1 + j)^{-n}}{j}}$$

where R - is the regular payment

j - equivalent rate (see example 1)

n - number of actual payments and is given by the formula, $\boldsymbol{n = mt}$ where $\boldsymbol{m}$ is the number of compounds and $\boldsymbol{t}$ is time express in years.

Example 1: ABCD Company offers ₱ 250,000 at the end of 3 years plus ₱ 400,000 at the end of 5 years. XYZ Company offers ₱ 35,000 at the end of each quarter for the next 5 years. Assume that money is worth 6% compounded semi-annually. Which company offers a better market value?

Given:

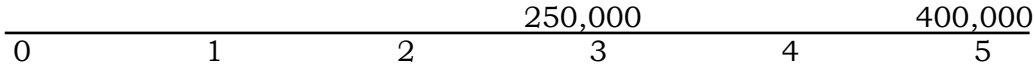
ABCD Company	XYZ Company
₱ 250,000 at the end of 3 years ₱400,000 at the end of 5 years	₱ 35,000 at the end of each quarter for the next 5 years

Find: Fair Market Value of each offer

Solution:

a. Illustrate the cash flows of the two offers using time diagrams.

ABCD's Company



XYZ's Company

	35,000	35,000	35,000	...	35,000
0	1	2	3	...	20

Suppose that selected focal date is the start of the term. Compute for the present value of each offer.

ABCD Company's Offer:

- In computing for the present value of ₱ 250,000 three years from now, the formula to be used is $P_1 = F\,(1+j)^{-n}$.

Given:
F = ₱ 250,000
$j = \frac{0.06}{2} = 0.03$
n = 2 (3) = 6

Solution:
$P_1 = F\,(1+j)^{-n}$
$P_1 = 250{,}000\,(1+0.03)^{-6}$
$P_1 = ₱\,209,371.06$

Given:
F = ₱ 400,000
$j = \frac{0.06}{2} = 0.03$
n = 2 (5) = 10

Solution:
$P_2 = F\,(1+j)^{-n}$
$P_2 = 400{,}000\,(1+0.03)^{-10}$
$P_2 = ₱\,297,637.57$

- In computing for the Fair Market Value (FMV), use the formula:
Fair Market Value (FMV) = $P_1 + P_2 = 209,371.06 + 297,637.57 =$ **₱ 507,008.63**

XYZ Company's Offer:

Compute for present value of a general annuity with quarterly payments but with semi-annual compounding interest at 6%.

- Solve the equivalent rate, compounded quarterly, of 6% compounded semi-annually.

$$F_1 = F_2$$

$$P\left(1+\frac{i^4}{4}\right)^{4(5)} = P\left(1+\frac{i^2}{2}\right)^{2(5)}$$

$$\left(1+\frac{i^4}{4}\right)^{20} = \left(1+\frac{0.06}{2}\right)^{10}$$

$$1+\frac{i^{(4)}}{4} = (1.03)^{\frac{1}{2}}$$

$$\frac{i^{(4)}}{4} = (1.03)^{\frac{1}{2}} - 1$$

$$\frac{i^{(4)}}{4} = 0.014889156$$

- The present value of an annuity is computed using the formula:
  $P = R\ \frac{1-(1+j)^{-n}}{j}$.

  Given:
  R = ₱ 35,000
  $j =$ 0.014889156
  n = 4 (5) = 20

  Solution:
  $P = 35{,}000\ \frac{1-(1+\ 0.014889156)^{-20}}{0.014889156}$

  $P =$ ₱ 601, 559.47

Therefore, XYZ Company's offer is preferable since its market value is larger than the other one.

Example 2:

Martha inherited a lot property from her grandfather. She wants to sell the lot because she will be moving to other country with her parents. She got two buyers with different offers on the lot that she wants to sell.

Jhazzy's offer: Down payment of ₱ 50,000 and a ₱ 1 million lump sum payment, 5 years from now.
Nika's offer: Down payment of ₱ 50,000 plus ₱ 40,000 every quarter for five years.

If money can earn 5% compounded annually, compare the fair market values of the two offers. Which offer has a higher market value?

Given:

Jhazzy's offer	Nika's offer
Down payment of ₱ 50,000 ₱ 1,000,000 after 5 years	Down payment of ₱ 50,000 ₱ 40,000 every quarter for five years

Find: Fair Market Value of each offer

a. Illustrate the cash flows of the two offers using time diagrams.

Jhazzy's offer

50,000					1,000,000
0	1	2	3	…	20

Nika's offer

50,000	40,000	40,000	40,000		40,000
0	1	2	3	…	20

Solution:
Choose a focal date and determine the values of the two offers at that focal date. For example, the focal date can be the date at the start of the term. Since the focal date is at $t = 0$, compute for the present value of each offer.

Jhazzy's offer:
Since ₱ 50,000 is offered today, then its present value is still ₱ 50,000. The present value of ₱ 1,000,000 offered five years from now is computed using the formula: $P = F\,(1 + j)^{-n}$.

Given:
F = ₱ 1,000,000
$j = \frac{0.05}{1} = 0.05$
n = 1 (5) = 5

Solution:
$P = F\,(1 + j)^{-n}$
$P = 1{,}000{,}000\,(1 + 0.05)^{-5}$
$P =$ ₱ 783,526.17

Fair Market Value (FMV) = Down payment + Present Value

Fair Market Value (FMV) = $50,000 + 783{,}526.17 =$ **₱ 833,526.17**

Nika's offer
Compute for the present value of general annuity with quarterly payments but with annual compounding at 5 %.
Solve the equivalent rate of 5% compounded annually.

$$F_1 = F_2$$

$$P\left(1 + \frac{i^4}{4}\right)^{4(t)} = P\left(1 + \frac{i^1}{1}\right)^{1(t)}$$

$$\left(1 + \frac{i^4}{4}\right)^{4} = \left(1 + \frac{0.05}{1}\right)^{1}$$

$$1 + \frac{i^{(4)}}{4} = (1.05)^{\frac{1}{4}}$$

$$\frac{i^{(4)}}{4} = (1.05)^{\frac{1}{4}} - 1$$

$$\frac{i^{(4)}}{4} = 0.012272234$$

- The present value of an annuity is computed using the formula: $P = R\,\frac{1-(1+j)^{-n}}{j}$.

  Given:
  R = ₱ 40,000
  $j = 0.012272234$
  n = 4 (5) = 20

  Solution:
  $$P = 40{,}000\,\frac{1-(1+0.012272234)^{-20}}{0.012272234}$$

  $P =$ ₱ 705, 572.68

Fair Market Value (FMV) = Down payment + Present Value
Fair Market Value (FMV) = $50,000 + 705,572.68 =$ **₱ 755,572.68**

Hence, Jhazzy's offer has a higher market value. The difference between the market values of the two offers at the start of the term is

$$833,526.17 - 755,572.68 = ₱\,77,953.49$$

Present Value and Period of Deferral of a Deferred Annuity

Deferred annuity is a type of annuity that does not begin until a given time interval has passed or payments are done at some later date of a period of time. In this type of annuity, we also consider a very important concept which is the **period of deferral**, this refers to time between the purchase of an annuity and the start of the payments for the deferred annuity.

Time Diagram for a Deferred Annuity

	R^*	R^*	…	R^*	R	R	…	R
0	1	2	…	k	k+1	k+2	…	k+n

In this time diagram, k "artificial payments" of R^* are placed in the period of deferral.

Example 1: Calculating the Period of Deferral of a Deferred Annuity

A. Quarterly payments of ₱ 300 for 9 years that will start 1 year from now.

Answer:

The first payment is at time 4 because there are 4 quarters in 1 year. The period of deferral is from time 0 to 3, which is equivalent to 3 periods or 3 quarters.

B. Semi-annual payments of ₱ 10,000 for 13 years that will start 4 years from now.

Answer:

The first payment is at time 8. The period of deferral is from time 0 to 7, which is equivalent to 7 periods or 7 semi-annual intervals.

In solving for the Present Value of a Deferred Annuity, we are going to use the formula below.

$$P = R\,\frac{1-(1+j)^{-(k+n)}}{j} - R\,\frac{1-(1+j)^{-k}}{j}$$

where R = regular payment

j = interest rate per period and is given by the formula, $j = \frac{r}{m}$ where r is the annual interest rate and m is the number of compounds.

Note: annually ***(m =1)*** quarterly ***(m =4)***
semi-annually ***(m =2)*** monthly ***(m =12)***

n = number of actual payments and is given by the formula, ***n=mt***
where ***m*** is the number of compounds and ***t*** is time express in years.

k = number of conversion periods in the period of deferral (or number of artificial payments) and is given by the formula, ***n = mt*** where ***m*** is the number of compounds and ***t*** (period of deferral) is time express in years.

Example 1: Calculating the Present Value of a Deferred Annuity

Mr. Song is celebrating his 40th birthday. He decided to buy a pension plan for himself that will allow him to claim ₱ 10,000 quarterly for 5 years starting 3 months after his 60th birthday. How much should he pay on his 40th birthday to pay off this pension plan if the interest rate is 8% compounded quarterly?

Given: R = ₱ 10,000
$i^{(4)}$ = 0.08
t = 5
m= 4

Find: P or the present value
Solution:

The annuity is deferred for 20 years and it will go on for 5 years. The first payment is due three months (one quarter) after his 60th birthday, or at the end of the 81-conversion period. Thus, there are 80 artificial payments.

Number of artificial payments: $k = mt = 4(20) = 80$

Number of actual payments: $n = mt = 4\,(5) = 20$

Interest rate per period: $j = \frac{0.08}{4} = 0.02$

If you assume that there are payments in the period of deferral, there would be a total of

$$\boldsymbol{k + n} = 80 + 20 = 100$$

Time Diagram:

P

					10,000	10,000	…	10,000
0	1	2	…	80	81	82	…	100

The present value can be solved using the formula:

$$P = R\,\frac{1-(1+j)^{-(k+n)}}{j} - R\,\frac{1-\,(1+j)^{-k}}{j}$$

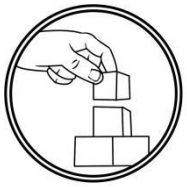
$$P = 10{,}000\,\frac{1-(1+0.02)^{-(80+20)}}{0.02} - 10{,}000\,\frac{1-\,(1+0.02)^{-80}}{0.02}$$

$$P = 10{,}000\,\frac{1-(1.02)^{-100}}{0.02} - 10{,}000\,\frac{1-\,(1.02)^{-80}}{0.02}$$

$$P = 430{,}983.5164 - 397{,}445.1359$$

$$P = 33{,}538.38$$

Therefore, the present value is **₱ 33, 538. 38**.



Explore

Here are some enrichment activities for you to work on to master and strengthen the basic concepts you have learned from this lesson.

Activity 1: Complete Me!

Directions: Read and analyze the given problem below. Then, complete the table by solving the given problem.

HOUSE AND LOT FOR SALE

Jaz and her siblings got a house and lot inheritance for their father. They wanted to sell the property to sell the property so that they can divide the amount among themselves. The siblings got two buyers with different offers:
Company A: Down payment of ₱ 250,000.00 and ₱ 1,000,000.00 lump sum payment, 5 years from now.
Company B: Down payment of ₱ 200,000.00 plus ₱ 50,000.00 every quarter for 5 years.
Compare the fair market values of the two offers if money can earn 5% compounded annually. Which company has a better offer? Why?

Given:	**Company A**: Down payment of ₱ 250,000.00 and ₱ 1,000,000.00 lump sum payment, 5 years from now. **Company B**: Down payment of ₱ 200,000.00 plus ₱ 50,000.00 every quarter for 5 years.
Find:	Fair market values of the two offers if money can earn 5% compounded annually
Solutions:	
Final Answer	

Activity 2: Fill the Missing Piece!

Directions: Complete the table below by writing the period of deferral of each deferred annuity problem. Write your answers on a separate sheet of paper.

Deferred Annuity Problem	Period of Deferral
1. Monthly payments of ₱ 2,000 for 5 years that will start 6 months from now.	
2. Annual payments of ₱ 6,000 for 10 years that will start 5 years from now.	
3. Semi-annual payments of ₱ 50,000 for 3 years that will start 5 years from now.	
4. Payments of ₱ 8,000 every 2 years for 10 years starting at the end of 6 years.	
5. Quarterly payments of ₱ 7,000 for 8 years that will start two years from now.	

Activity 3: Solve Me!

Directions: Read and analyze the given problem. Then, complete the table below.

1. Jharen availed of a loan from a bank that gave him an option to pay ₱ 20,000 monthly for 2 years. The first payment is due after 4 months. How much is the present value of the loan if the interest rate is 10% converted monthly?

Given:	
Asked:	
Solution:	
Final Answer:	

Deepen

At this point, you will be applying the key concepts of annuities specifically, in calculating the fair market value of a cash flow stream that includes an annuity and calculating the present value and period of deferral of a deferred annuity. The instructions for the given activity are provided below. The scoring rubric on the next page will be used in assessing your output.

Activity 1: Solve Me!

What you need

Bond Paper
Ballpen

What you have to do

1. Read and analyze the given problem below.
2. Calculate the fair market value of the problem.
3. Show your solutions in solving the given problem.

WORDED PROBLEM

You are planning to buy a condominium as you start working in a new workplace. The brokers of real estate's offer them the following:

- Condominium A: Down payment of ₱ 300,000.00 plus a ₱ 2,500,000.00 lump sum payment three years from now.
- Condominium B: Down payment of ₱ 200,000.00 plus ₱ 100,000.00 every six months for three years.

Compare the true value of the two offers if the money can earn 6.5% compounded annually. Which offer is better for you?

Activity 2: Annuities in Real-Life!

In the previous lesson, you have learned about deferred annuity and its applications in real life. Your task now is to find for real-life situations showing an application of Deferred Annuity in your community. Follow the given format below.

Example:

1. Search the page of an appliance store and check how much a certain appliance costs if it is (a) paid in full, or (b) paid by installment or you can also interview someone who is working in an appliance store in your barangay. Compare the payment in cash and in installment basis. Which is better to pay in cash or in installment basis? Why?

Annuities in My Community	
Problem/Situation:	
Regular Payment	
Period of Deferral	
Annual Interest Rate	
Number of Actual Payments	
Interest Rate per Period	
Number of conversion periods in the deferral	
Solution:	

Rubric for Scoring the Output

Categories	**Excellent 5**	**Fair 3**	**Poor 1**	**Score**
Content	Appropriate content is used for the worded problem. Student clearly understands the mathematical concepts.	Appropriate content is used for the worded problem. Student understands most of the mathematical concepts.	Appropriate content is not observed. Student does not demonstrate understanding of the mathematical concepts.	
Applies appropriate procedures	All procedures are appropriate for the problem.	Applies mostly appropriate procedures for the problem.	Applies inappropriate procedures for the problem.	
Solution and Answer	Correct solution and information about the problem. Gives correct and complete answer.	Computation and answer may give contain minor flaws.	Computation in incorrect, attempts an answer.	

Gauge

Directions: Read each item carefully and select the correct answer. Write the letter of your choice on a separate sheet of paper.

1. What term refers to payments received that can be represented by positive numbers?
   A. Cash flow B. Cash inflows
   C. Cash outflows D. Cash value

2. Which of the following refers to the selling price of any property where the buyer and the seller made an agreement?
   A. Annuity B. Fair Market Value
   C. Periodic Interest D. Periodic Payment

3. Which of the following refers to the time from the start of the first payment until the end of the last payment period?
   A. Fair Market Value B. Period of Deferral
   C. Periodic Payment D. Term of annuity

4. What term refers to the time between the purchase of an annuity and the start of the payments for the deferred annuity?
   A. Annuity B. Fair Market Value
   C. Period of Deferral D. Periodic Payment

5. Which of the following refers to the amount of money needed to invest in order to receive a series of payments for a period of time?
   A. Fair Market Value B. Future Value
   C. Periodic Payment D. Present Value

6. What type of annuity does not begin until a given time interval has passed?
   A. Annuity Due B. Deferred Annuity
   C. General Annuity D. Ordinary Annuity

7. What is the period of deferral in the problem "Semi-annual payments of ₱ 6,000 for 13 years that will start 4 years from now"?
   A. 4 B. 5 C. 6 D. 7

8. In the deferred annuity problem, "Annual payments of P5,000 for 10 years that will start 5 years from now", what is the period of deferral?
   A. 4 B. 5 C. 6 D. 7
9. What is the period of deferral in the problem "Quarterly payments of ₱ 3,000 for 8 years that will start two years from now"?
   A. 4 B. 5 C. 6 D. 7
10. In the problem, "Annual payments of ₱ 2,500 for 24 years that will start 12 years from now", what is the period of deferral?
   A. 9 B. 10 C. 11 D. 12

11. How much is the fair market value of a lot if the present value three years from now is ₱ 500,000.00 and the down payment is ₱ 150,000.00?
    A. ₱ 500,000.00 B. ₱ 550,000.00
    C. ₱ 600,000.00 D. ₱ 650,000.00

12. Fair market value is computed by adding the down payment and present value. If the down payment for a car is ₱ 30, 000 and the present value is ₱ 753, 526.20. How much is the fair market value?
    A. ₱ 733, 526. 20 B. ₱ 733, 566. 20
    C. ₱ 753, 526. 20 D. ₱ 783, 526. 20

13. Jade bought the car of her mother which she will pay ₱ 10,000.00 per quarter for 10 years after being deferred for 5 years with the interest rate of 6% compounded quarterly. What is the present value of this annuity?
    A. ₱ 222,116.30 B. ₱ 223,116.30
    C. ₱ 224,116.30 D. ₱ 225,116.30

14. Jansen availed of a cash loan that gave him an option to pay 10,000 monthly for 1 year. The first payment is due after 6 months. How much is the present value of the loan if the interest rate is 12% converted monthly?
    A. ₱ 107,088.20 B. ₱ 107,089.20
    C. ₱ 107,098.20 D. ₱ 107,099.20

15. Jeff decided to sell their farm and to deposit the fund in a bank. After computing the interest, they learned that they may withdraw ₱ 480,000.00 yearly for 8 years starting at the end of 5 years when it is time for him to retire. How much is the fund deposited if the interest rate is 5% converted annually?
    A. ₱ 2,230,766.23 B. ₱ 2,330,766.23
    C. ₱ 2,430,766.23 D. ₱ 2,530,766.23

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