Mathematics for Management

Chapter 7: Promissory Notes

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Expected Outcome:

Upon the completion of this course, students will have the ability to:

1. Identify the types of promissory notes
2. Obtain the maturity value, bank discount and proceed when the note was discounted
3. Calculate the simple interest equivalent to bank discount rate by using the formula

Type of Promissory Notes

Promissory notes can be of two types:

Interest Bearing Note	Non-Interest Bearing Note
The rate of **interest is stated** on the note and is usually simple interest rate.	The rate of **interest is not stated** on the note.

The main features of a note usually include the:

- **Face Value/Principal amount** : the amount stated on the note
- **Interest rate** if any
- **The date** : the date on which the note is made
- **Terms or repayment** : the length of time until the note is due for payment
- **Maturity date** : the date on which the maturity value is due
- **Payee** : the person to whom the payment is to be made
- **Maker** : the person that signs the note

PROMISSORY NOTE

Example of an Interest Bearing Note:

RM *2,900.00* *January 1, 2017*

Ninety Days AFTER DATE *I* PROMISE TO PAY TO

THE ORDER OF *Oasis Bank*

Two Thousand Nine Hundred and Zero Cent

PAYABLE AT *Oasis Bank*

WITH INTEREST AT *7% per Annum from Date*

Interest

No. *2307* Due *April 1, 2017* *Sofia Nadielle*

PROMISSORY NOTE

Example of a Non-Interest Bearing Note:

RM ***2,900.00*** ***January 1, 2017***

Ninety Days AFTER DATE ***I*** PROMISE TO PAY TO

THE ORDER OF ***Oasis Bank***

Two Thousand Nine Hundred and Zero Cent

PAYABLE AT ***Oasis Bank***

No Interest

No. ***2307*** Due ***April 1, 2017*** ***Sofia Nadielle***

Example:

RM10,000 *October 2, 2017*

Six months after date, *Good Wealth Inc.* promises to pay to *C. K. Company* plus interest

at the rate of *5%* per annum

Due: *April 2, 2018* *Good Wealth Inc.*

State the main features of the note based on the above promissory note.

Solution:

- Face Value/Principal amount: RM10, 000
- Interest rate : 5%
- The date : 2 October 2017
- Terms or repayment : 6 months
- Maturity date : 2 April 2018
- Payee : C.K. Company
- Maker : Good Wealth Inc.

Maturity Value

What is maturity value?

- The total sum of money which the payee will receive on the maturity date

Formula Maturity Value:

Interest bearing notes:

Maturity value, S = Face value + Interest

= P + I

= P + Prt

= P(1+rt)

Non-Interest bearing notes:

Maturity value, S = Face value

= P

Example:

Peter has two different notes and both have a face value of RM5000 for 60 days. The **first note has a simple interest rate of 8%**, while the **second note has a discount rate of 7%**. What is the maturity value for each note?

Solution:

$$S_1 = P(1+rt)$$

$$= RM5000\left(1 + 0.08\left(\frac{60}{360}\right)\right)$$

$$= RM5066.67 \text{ (interest bearing note)}$$

$$S_2 = P$$

$$= RM5000 \text{ (non-interest bearing note)}$$

Exercises:

- A promissory note dated 23 October 2015 reads *'Seven months from date, I promise to pay RM4000 with interest at 6% per annum*'. Find

  (i) the maturity date

  (ii) the maturity value

- The maturity value for 90 days promissory note is RM450 that bears interest at 8% per annum. What is the face value for this interest bearing note?

Bank Discount & Discounting Notes

What is bank discount?

- The interest charge from a bank for a short term loans.
- Bank discount computed based on the maturity value (final amount)

What is discounting notes?

- Selling the notes to the bank before its maturity date

Why discounting notes?

- The holder needs a cash before its maturity date

Formula Bank Discount

D = Sdt

where

S: the simple amount/maturity value

d: discount rate (%)

t: term of discount in years

Proceed

If the note was discounted:

- the date of the note is discounting date
- the amount received on the date of discounting is called the **proceeds.**
- The terms of discount starting from the note was discounted until the maturity date.

Proceeds = Maturity Value – Bank Discount

= S – D

= S – Sdt

= S(1-dt)

Example:

On 2 April 2016, Sharifah borrowed an amount of RM 8000 at 2% interest rate for three months. The discount rate charged by the lender is 10%. Find the bank discount if the note was discounted on 2 May 2012.

SOLUTION:

Date: 2 April 2012
Term of the note: 3 months
Maturity date: 2 April 2012 + 3 months = 2 July 2012
Term of discount = 2 May 2012 until 2 July 2012 = 2 months

By using the formula,

$$S = P(1+rt)$$

$$= RM8000\left(1 + 0.02\left(\frac{3}{12}\right)\right)$$

$$= RM8040$$

$$D = Sdt$$

$$= RM8040 \times 0.1 \times \left(\frac{2}{12}\right)$$

$$= RM134$$

Exercises:

- If Tong will receive RM4000, 30 days before its maturity date, calculate the amount of maturity value at 12% bank discount?

Simple Interest Equivalent to Bank Discount

- An interest rate, r% and discount rate d% are said to be equivalent if the two rates give the same present value for an amount due in the future. Thus,

  Calculate d% given that r%

$$d = \frac{r}{1+rt}$$

  Calculate r% given that d%

$$r = \frac{d}{1-dt}$$

Example:

A note of RM 4000 will due in six months. A bank discount rate of 12% is applied to this note. Find the equivalent simple interest rate that is charged by the bank.

$$r = \frac{d}{1 - dt}$$

$$= \frac{0.12}{1 - 0.12\left(\frac{6}{12}\right)}$$

$$= 0.1277 \text{ @ } 12.77\%$$

Exercise: What discount rate should a lender charge to earn an interest rate of 20% on a 9 months loan?

THE END

~ THANK YOU~

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