

Brief exercises and solution:

Brief exercise: 01

Jacobs Company borrowed \$10,000 on a one-year, 8 percent note payable from the local bank on April 1. Interest was paid quarterly, and the note was repaid one year from the time the money was borrowed. Calculate the amount of cash payments Jacobs was required to make in each of the two calendar years that were affected by the note payable.

Data:

Borrowed amount = 10,000interest rate = 0.08 or 08 percent Note maturity = 1 year ... interest payment method = quarterly

Required: total cash paid by Jacob in year 1 and year 2.

Analysis of question:

If we look at the question we come to know that from 1st April to 31st December there are 3 quarters in this year means 9 months are in year. So in year 1 only 9 month interest will be paid.

In year 2 there are 3 months so 3 months interest will be paid in year two and because now 12 are complete so Note will mature and payment of note will also be paid in 2nd year.

Solution:

Year 01:

Interest at the end of first 3 quarters or 9 months $[10,000 \times 0.08 \times 09/12] =$ 600

Year 02:

Interest at the end of first three months $[10,000 \times 0.08 \times 03/12] \dots \dots \dots =$ 200

Repayment of loan= 10,000

So payment in year 1 = 600

Payment in year two = 10200

And total payment = 10800

Brief exercise 2:

One of the advantages of borrowing is that interest is deductible for income tax purposes.

- a) If a company pays 8 percent interest to borrow \$500,000, but is in an income tax bracket that requires it to pay 40 percent income tax, what is the actual net-of-tax interest cost that the company incurs?
- b) What is the effective interest rate that is paid by the company?

Solution: part a

Interest cost before income tax

$$500,000 \times 0.08 = 40,000$$

Tax savings

$$40,000 \times 0.40 = 16,000$$

$$\text{Interest cost net of income tax} = 24,000$$

Solution: part b

Formula to calculate effective interest rate = interest rate x [1 – tax rate]

After putting the values into formula

$$\text{Effective interest rate} = 0.08 \times [1 - 0.40]$$

$$\text{Effective interest rate} = 0.08 \times [0.60]$$

$$\text{Effective interest rate} = 0.048 \text{ or } 4.8 \text{ percent}$$

Brief exercise: 03

Cronin, Inc., sells \$1,000,000 general obligation bonds for 98. The interest rate on the bonds, paid quarterly, is 6 percent. Calculate (a) the amount that the company will actually receive from the sale of the bonds, and (b) the amount of both the quarterly and the total annual cash interest that the company will be required to pay

Solution:

Amount received from sale of bonds:

$$\$1,000,000 \times 0.98 = \$980,000$$

Quarterly and annual cash interest required:

Quarterly

$$\$1,000,000 \times .06 \times 3/12 = \$15,000$$

Annual

$$\$15,000 \times 04 = \$60,000$$

Brief exercise: 04

Pearl Company sells \$1,000,000 general obligation bonds for 101. The interest rate on the bonds, paid quarterly, is 5 percent. Calculate (a) the amount that the company will actually receive from the sale of the bonds, and (b) the amount of both the quarterly and the total annual cash interest that the company will be required to pay

Solution:

Amount received from sale of bonds:

$$\$1,000,000 + [\$1,000,000 \times 0.01]$$

$$\$1,000,000 + 10,000 = 1,010,000$$

It can also be calculated as

$$1,000,000 \times 1.01 = 1,010,000$$

Quarterly and annual cash interest required:

Quarterly

$$\$1,000,000 \times 0.05 \times 3/12 = \$12500$$

Annual

$$\$12500 \times 04 = \$50,000$$

Brief exercise: 05

Red & Blue Company sold bonds at 97 on an interest payment date for \$500,000. Assuming the bonds will be retired in 10 years and interest is paid annually, calculate the amount of cash that will be received and paid by Red & Blue in the first year, as well as the interest expense that will be recognized in that year. The bonds carry a stated interest rate of 5 percent.

Solution:

Cash received from sale of bonds:

$$\$500,000 \times 0.97 = \$485,000$$

Cash paid for interest in first year:

$$\$500,000 \times 5\% = \$25,000$$

Interest expense realized:

Actual interest as calculated above for the 1 st year =	\$25,000
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Plus: Amortization of discount: Total discount / number of years

$(\$500,000 - \$485,000) / 10 \text{ years} =$	<u>1500</u>
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Total Interest realized =	<u><u>26500</u></u>
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Brief Exercise 06:

Purple & Orange, Inc., sold \$700,000 of bonds on an interest payment date at 102. Assuming the bonds will be retired in 10 years and interest is paid annually, calculate the amount of cash that will be received and paid by Purple & Orange in the first full year, as well as the amount of interest expense that will be recognized in that year. The bonds carry a stated interest rate of 6.5 percent.

Solution:

Cash received from sale of bonds:

$$\$700,000 \times 1.02 = \$714,000$$

Cash paid for interest in first year:

$$\$700,000 \times .065 = \$45,500$$

Interest expense realized:

Actual interest as calculated above for the 1 st year =	\$45,500
Less: Amortization of premium: Total discount / number of years	
$(\$714,000 - \$700,000)/10 \text{ years} =$	<u>- 1400</u>
Total Interest realized =	<u>44,100</u>

Brief Exercise 07:

Fox Company has debt totaling \$2,000,000 and total stockholders' equity of \$4,000,000. Wolfe Company has debt totaling \$3,000,000 and stockholders' equity of \$5,000,000

- Calculate the debt ratio for each company
- Briefly explain the meaning of the debt ratio

Solution:

Formula of debt ratio = Total debt / [Total debt + Total Equity]

Fox Company:

$$\$2,000,000 / (\$2,000,000 + \$4,000,000) = 33.3\%$$

Wolfe Company:

$$\$3,000,000 / (\$3,000,000 + \$5,000,000) = 37.5\%$$

Part b

The debt ratio is a measure of the extent to which the company's assets have been financed by debt financing in comparison with equity financing.

Brief Exercise 08:

Joseph Max, Inc., sold 10-year, 7 percent bonds for \$1,000,000 at 98. On the interest payment date at the end of the 5th year the bonds were outstanding, 50 percent of the bonds were retired by Max at 101 under an early retirement option that was written into the bond agreement. Determine the gain or loss that Max will incur as a result of retiring the bonds.

Solution:

First of all we need to calculate total discount on bonds

Because bonds were sold at 98 percent of face value so company received

$$1,000,000 \times 0.98 = 980,000$$

$$\text{So, discount} = 1,000,000 - 980,000 = 20,000$$

This discount is for 10 years and bonds were repurchased after 5 years mean half discount had been converted into interest expense

Remaining discount at date of retirement of bonds

$$\$20,000 \times 1/2 = \$10,000$$

Because total bonds are not repurchased only half mean 50 percent bonds are repurchased so discount in 50 percent bonds is equal to

$$10,000 \times 0.50 = 5000$$

Now after working we come to the solution:

Loss on sale of retirement of bonds:

Repurchase price (\$500,000 x 1.01) 505000

Value of bonds at the time of purchase

Face value

(\$1,000,000 x .50) \$500,000

Minus: Discount remaining

→ (\$10,000 x .50) as calculated above \$5000

So value of Bond \$495,000

Value of bond is less than repurchase price so it is clear that there is loss.

Loss on repurchase = Repurchase price – value of bonds at the time of repurchase

Loss on repurchase = \$505000 – \$495000

Loss on repurchase= \$10,000



Thank You!!!