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**ASSIGNMENT: BUSINESS FINANCE**

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## Business Finance

### Question no (1) (a):-

Ali deposited \$2000 in saving account. The annual interest is 8 percent, compounded semiannually. How many years will it take for his money to grow to \$4765?

Solution:-

Given Data:-

Present value = P.v = \$ 2000

Annual interest rate = i = 8%

For semiannual =  $i / 2 = 8\% / 2 = 4\%$

Future value = F.v = \$4765

No of years = n\*m = ?

As we know that

$$FV = PV (1 + i)^n$$

So rearranging it for n we get

As it is semiannual compounding so  $n = 2n$

$$FV/PV = (1 + i / 2)^{2n}$$

Take “2n” square root on both side we get

$$(FV/PV)^{1/2n} = (1 + i)^{2n(1/2n)}$$

Now take natural log on both side we get

$$\ln (FV/PV)^{1/2n} = \ln (1 + i)$$

Rearranging it we get

$$n = \left\{ \frac{\ln(FV/PV)}{\ln(1+i)} \right\} / 2$$

Putting values in formula

$$n = \left\{ \frac{\ln(4765/2000)}{\ln(1+.04)} \right\} / 2$$

$$n = \{.868/.039\} / 2$$

$$n = 11.06 \text{ years}$$

### **Question no (1) (b):-**

A payment of \$100 per year forever is made with a discount rate of 10%. what is the present value of these payments?

Solution:-

Principle amount = R = \$100

Interest rate = i = 10% = .10

As we know that a perpetuity is an ordinary annuity whose payments or receipts continue forever.

So  $PV = R/i$

Putting values in it we get

$$PV = 100/.10$$

$$PV = \$ 1000.$$

### **Question (2) (a)**

#### **Nominal Interest Rate**

The nominal interest rate is the stated interest rate of a bond or loan, which signifies the actual monetary price borrowers pay lenders to use their money. If the nominal rate on a loan is 5%, borrowers can expect to pay \$5 of interest for every \$100 loaned to them. This is often referred to as the coupon rate, because it was traditionally stamped on the coupons redeemed by bondholders.

### Real Interest Rate

The real interest rate is so named, because unlike the nominal rate, it factors inflation into the equation, to give investors a more accurate measure of their buying power, after they redeem their positions. If an annually compounding bond lists a 6% nominal yield and the inflation rate is 4%, then the real rate of interest is actually only 2%.

For example, a bond with a 3% nominal rate will have a real interest rate of -1%, if the inflation rate is 4%. A comparison of real and nominal interest rates can be calculated using this equation:

$$RR = \text{Nominal Interest Rate} - \text{Inflation Rate}$$

RR = Real Rate of Return.

### Question (2) (b):-

**OTC or Over the counter market** is a decentralized market for unlisted securities, not having a specific physical location, rather the firms/persons involved in trading directly negotiate over a communication network such as telephone lines, emails, computer terminals, etc. Trading Over the counter is also called off-exchange trading, because of the absence of a formal exchange.

In general, those companies which do not fulfil the prerequisites of the stock exchange for listing their stocks, trade them over the counter. The trade takes place between two companies or financial institutions. Financial products such as bonds, derivatives, currencies, etc. are mainly traded OTC.

It is a dealer's market, where they buy and sell the financial products for their account and the investors can directly contact the dealers, who are interested in selling their stocks or bonds they have or they can talk to the brokers, who will find out the dealers offering the stocks with the best price.

**Exchange** refers to the exchange-traded market, which refers to a centralized and regulated financial market, where securities, commodities, derivatives, etc. of listed companies are bought and sold between stockbrokers and traders.

The prices of securities such as shares, debentures, notes, corporate bonds, etc. are decided by the market demand and supply forces. It can be a physical trading location such as premises, etc. or it can be an electronic platform, i.e. website.

It has an association of persons (registered or unregistered) commonly referred to as member brokers. It is established with the aim of governing the trade of securities by the general public and companies, as a whole. There is a set of rules imposed by the Exchange on the firms and brokers, which participate in the trading of securities.

And why should I select stock exchange because exchange is obviously a step ahead of the OTC due to certain reasons such as it provides liquidity to encash the securities whenever required, transparency in terms of availability of information, flexibility to change the investment portfolio at any time, less risk and maintenance of fair price.

**Question no (3) (a):**-Calculate the present value of \$40000 to be received fifteen years from now at an annual discount rate of 10 percent.

Solution:-

Future value = FV = \$40000

No of years = n = 15 years

Annual discount rate = i = 10% = 0.10

As we know that

$$FV = PV (1 + i)^n$$

So rearranging it for present value (PV)

$$PV = FV / (1 + i)^n$$

so putt the values in it

$$PV = 40000 / (1.10)^{15}$$

$$PV = \$ 9575.68$$

### **Question no (3) (b):-**

**Ordinary annuity:-**An ordinary annuity is a series of equal payments made at the end of consecutive periods over a fixed length of time.

(1). Utility bills, as we do the payment at the end of each period when we enjoy the benefits of it for that each period.

(2). salaries of employee, as after providing services for each period they receive payment for their services provided at the end of each period.

### **Annuity due:-**

Annuity due is an annuity whose payment is due immediately at the beginning of each period. A common example of an annuity due payment is

(1). Rent, as landlords often require payment upon the start of a new month as opposed to collecting it after the renter has enjoyed the benefits of the apartment for an entire month.

(2) School/ University fees, at the beginning of each period we have to do payment so that we can receive educational services in return for each period.