

## ART &amp; DESIGN DEPARTMENT

FINAL EXAM SUMMER - 2020

SUBJECT:- Business mathematics.

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BTD

QUESTION #1 (a):-

TIME VALUE OF MONEY.

Time value of is the difference b/w an amount of money in the present and that same amount of money in the future. Having money now is more ~~valuable~~ valuable than having money later.

That is, the earlier a sum of money is received, the more it is worth, b/c over time money can earn more money, or interest.

There are three reasons why dollar tomorrow is worth less than a dollar today.

- Individuals prefer present consumption to future consumption. To induce people to give up present consumption you have to offer them more in the

future.

- When there is monetary inflation, the value of currency decreases over time. The greater the inflation, the greater the difference in value b/w a dollar today and a dollar tomorrow.
- If there is any uncertainty (risk) associated with the cash flow in the future, the less that cash flow will be valued.

b) Mike borrowed \$1,200 at 10% ... -?

Solution:-

GIVEN DATA:-

principal (present value) (P) = \$1,200.

interest rate (i%) r = 10% or 0.10.

Time in yrs (t) = 9/12 years.

To find:- F = ?

Solution:- As we know,  

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

$$\Rightarrow F = 1200 \left[ 1 + \left( 0.10 \times \frac{9}{12} \right) \right]$$

$$\Rightarrow F = 1200 (1 + 0.075)$$

$$\Rightarrow F = 1200 (1.075)$$

$$\therefore \boxed{F = \$1290}$$

Ans

## QUESTION # 2:

Paul's Guitar Shop, Inc.

Balance Sheet

September 28, 2020.

## Assets

## Current Assets

Cash	32,800
Accounts Receivable	300
Prepaid Rent.	1,000
Inventory	<u>39,800</u>
Total Current Assets	73,900

## Long term Assets

Leasehold Improvements	100,000	
Accumulated Depreciation	<u>(2,000)</u>	98,000
Total long term Assets.		<u>98,000</u>
Total Assets:		171,900

## Liabilities

## Current Liabilities

Accounts payable	49,000
Accrued Expenses	450
Unearned Revenue	<u>1,000</u>
Total current Liabilities	50,450
long-term liabilities	99,500
Total liabilities:	<u>1,49,950</u>

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## Owner's Equity

Owner's Equity

Retained Earnings

11,950

Common Stock

10,000

Total Owner's Equity

21,950

Total liabilities and owner's Equity :

171,900

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### QUESTION # 3 :-

#### IMPORTANT COMPONENT OF INCOME - STATEMENT:

The income statement may have minor variations b/w different companies, as expenses and income will be dependent on the type of operations or business conducted.

However there are several generic line items that are commonly seen in any income statement.

The most common income statement items include:

#### \* SALES REVENUE :-

Sales revenue is the company's revenue from sales or services, displayed at the very top of the statement. This value will be the gross of the costs associated with creating the goods sold or in providing services.

⑥

## \* COST OF GOODS SOLD (COGS) :-

COGS is line-item that aggregates the direct costs associated with selling products to generate revenue. This line item can also be called cost of sales if the company is a service business. Direct costs can include labor, parts, materials, and an allocation of other expenses such as depreciation.

## \* GROSS PROFIT :-

Gross profit is calculated by subtracting cost of goods sold (or cost of sales) from sales Revenue.

## \* MARKETING, ADVERTISING AND PROMOTION EXPENSES :-

Most businesses have some expenses related to selling goods and/or services. Marketing, advertising and promotion expenses are often grouped together as they are similar expenses, all related to selling.

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## \* GENERAL AND ADMINISTRATIVE (G & A) EXPENSES :-

G & A Expenses include the selling, general, and the administrative section that contains all other indirect costs associated with running the business. This include salaries and wages, rent and office expenses, insurance, travel expenses, and sometimes depreciation and amortization, along with other.

## \* EBIT :-

EBIT, while not present in all income statements, EBIT stands for Earnings before interest, Tax. It is calculated by subtracting S G & A expenses from gross profit.

## \* OPERATING INCOME :-

Operating income represent what's earned from regular business operations. In other words, it's the profit before any non-operating ~~income~~ expenses, interest,

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or taxes are subtracted from revenues. EBIT is a term commonly used in finance and stands for Earning before Interests and taxes.

\* INTEREST:-

Interest expense. It is common for companies to split out interest, expense and interest income as a separate line item in the income statement. This is done in order to reconcile the difference b/w EBIT and EBT. Interest expense is determined by the debt schedule.

\* EBT (Pre-Tax Income) :

EBT stands for Earning before Tax, also known as pre-tax income, and is found by subtracting interest expenses from operating income. This is the final subtotal before arriving at net income.



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## \* INCOME TAXES:-

Income taxes refer to the relevant taxes charged on pre-tax income. The total tax expense can consist of both current taxes and future taxes.

## \* NET INCOME:-

Net income is calculated by deducting income taxes from pre-tax income. This is the amount that flows into retained earnings on the balance sheet, after deductions for any dividends.

## QUESTION # 4 (a) :-

RATIO :-

A ratio is a comparison b/w two quantities.

## Examples:-

We all use ratios everyday; One pepsi costs 50 cents describes a ratio. On a map, the legend might tell us one inch is equivalent to 50 miles or we might notice one hand has five fingers. These are all examples of comparisons - ratios.

We can write ratios in three different forms, i.e.:-

1 → 1 to 5

2 → by using a colon 1:50

3 → by using fraction  $\frac{1}{50}$

Continued:

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Q4(a) :-

## PROPORTIONS:-

A Proportion is a statement of equality between 2 ratios.

It can be written in two ways ;  
as two equal fractions  $\frac{a}{b} = \frac{c}{d}$   
or using a colon  $a:b = c:d$ .

The following proportion is read as  
" twenty seven is to twenty nine  
as three is to four ."

$$\frac{27}{29} = \frac{3}{4}$$

Looking at proportion like  
 $\frac{27}{29} = \frac{3}{4}$ , we might see  
some relationships that exists  
if we take time to manipulate  
numbers.

for instance, if we tipped both ratios up sidedown?

$$\frac{29}{27} = \frac{4}{3} \text{ they are also equal}$$

Also write by sideways.  $\frac{4}{3} = \frac{29}{27}$ .

Also cross multiply and retain  
equality. In other words  $4 \times 27 = 29 \times 3$

# QUESTION # 4(b):-

If there are three boys . . . . ?

Solution:-

The first comparison given is boys to girls, knowing this, we would like to set up proportion that looks like this:

$$\frac{\text{boys}}{\text{girls}} = \frac{\text{boys}}{\text{girls}}$$

We can put 3 and 7 on the left side to represent boys and girls, we have to find, where does 440 go? It does not represent just boys or just girls, so we can't put it in either position on right side. 440 represents total no. of girls and boys.

We have proportion like:

$$\frac{b}{g} = \frac{b}{g} \text{ then } \frac{b}{b+g} = \frac{b}{b+g} \text{ true}$$

From problem we see b+g is the total no. of boys and girls  
filling values in above proportion we have

$$\frac{3}{3+7} = \frac{b}{440} = \frac{3}{10} = \frac{b}{440}$$

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Solving : by cross multiplication

$$10b = 3 \times 440$$

$$10b = 1320$$

$$\boxed{b = 132} \quad \text{Ans}$$

There would be 132 boys, for finding girls we could subtract 132 from 440

i.e. :  $\text{girls} = 440 - 132$   
 $\boxed{\text{girls} = 308}$

## QUESTION # 5 (a):

### CAPITAL BUDGETING

#### \* DEFINITION :-

Capital budgeting refers to the process we use to make decisions concerning investments in the long-term assets of the firm. The general idea is that the capital, or long-term funds, raised by the firms are used to invest in assets that will enable the firm to generate revenues several years into the future.

#### \* IMPORTANCE :

Capital budgeting decisions impact the firm for several years, they must be carefully planned. A bad decision can have a significant effect on the firm's future operations. In addition, the timing of the decisions is important. Many capital budgeting projects take years to implement. If firms do not plan accordingly, they

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might find that the timing of  
capital budgeting decision is  
too late, thus costly  
with respect to competition.

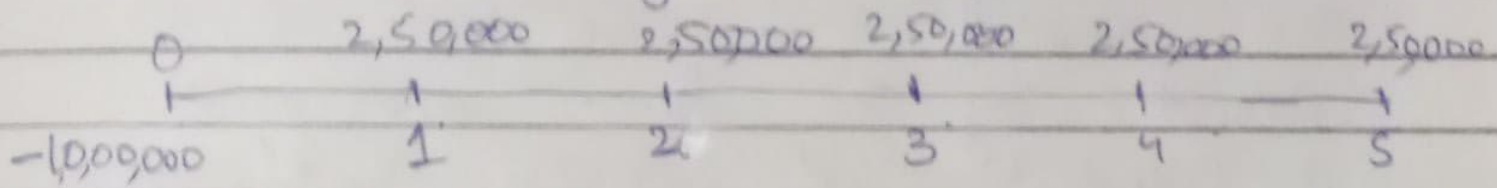
# CAPITAL BUDGETING

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QUESTION # 5(b) :- Mr XYZ . . . . . ?

Mr XYZ owns a car rental company planning to start a new route. XYZ think the project should have PBP of 5 years

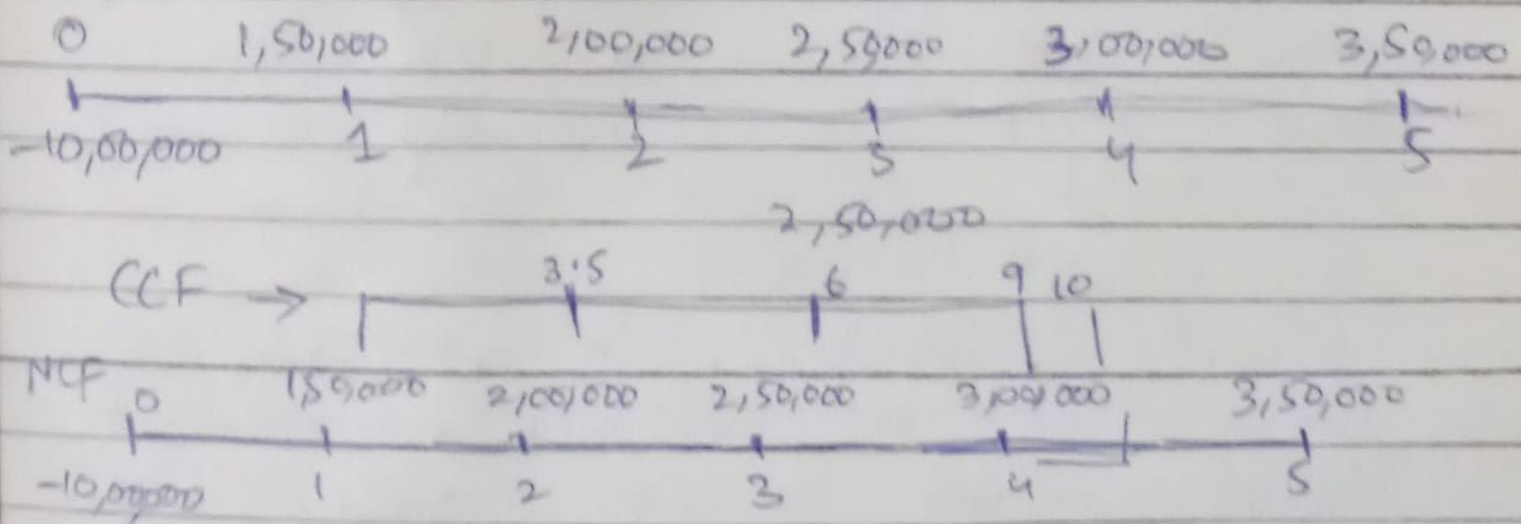
Let he buy a car at 1000000



In this the cash flows are uniform so we can simply calculate the PBP

$$\text{Payback} = \frac{1,000,000}{2,50,000} = 4 \text{ years}$$

In case CF are not uniform then i.e



$$3.5 \times 1 \rightarrow 1$$

$$\begin{aligned} \text{Payback} &= 4 + 0.29 \text{ years} \\ &= 4.29 \text{ years} \end{aligned}$$

$$\begin{aligned} 1 &= \frac{1}{3.5} \# \\ &= 0.29 \text{ yrs} \end{aligned}$$