UNIT -IV

CAPITAL BUDGETING

Capital is the money or resources that are used to start a business. Capital is the resource that can be money in the form of cash or kind which is used to further purchase raw materials and inputs. It is an extremely important part as every business needs some amount of capital in the beginning. There are different forms of capital property, cash or titles to wealth. It is the aggregateof funds used in the short run and long run. An economist views capital as the value total assets available with the business. An accountant sees the capital as the difference between the assets and liabilities.

Significance of capital

1. **To promote a business**: Capital is required at the promotion stage. A large variety of expenses have to be incurred on project reports, feasibility studies and reports, preparation and filing of various documents, and for meeting various other expenses in connection with the raising of capital from the public.
2. **To conduct business operations smoothly**: Business firms also need capital for the purpose of conducting their business operations such as research and development, advertising, sales promotion, distribution and operation expenses.
3. **To expand and diversify:** The firm requires a lot of capital for expansion and diversification purposes. This includes development expense such as purchase of sophisticated machinery and equipment and also payment towards sophisticated technology.
4. **To meet contingencies**: A firm needs funds to meet contingencies such as sudden fall in sales, major litigation, nature calamities like fire, and so on.
5. **To pay taxes**: The firm has to meet its statutory commitments such as income tax and sales tax, excise duty and so on.
6. **To pay dividends and interests:** The business has to make payment towards dividends and its interest to shareholders and financial institutions respectively.
7. **To replace the assets:** The business needs to replace its assets like plant and machinery after a certain period of use. For this purpose the firm needs funds to make suitable replacement of assets in place of old and worn out assets.
8. **To support welfare programmes**: The company may also have to take up social welfare programmes such as literacy drive, and health camps, It may have to donate to charitable trusts, educational institutions or public services organizations.
9. **To wind up**: At the time of winding up, the company may need funds to meet liquidation expenses

Types of capital

A) Fixed capital
B) Working capital

FIXED CAPITAL

Fixed capital is that portion of capital which invested in acquiring long term assets such as land and buildings, plant and machinery, furniture and fixtures, and so on, fixed capital formsthe skeleton of the business. It provides the basic assets as per the business needs.

Features of fixed assets:

1. **Permanent in nature:** Fixed capital has a long-lasting existence. It is permanent in nature. It cannot be withdrawn from the business. However, it can be withdrawn only when the business closes or shuts down (i.e. liquidates).
2. **Profit generation**: Fixed asset are the sources of profits but they can never generateprofits by themselves. They use stocks, cash and debtors to generate profits.
3. **Low liquidity**: The fixed assets cannot be converted into cash quickly. Liquidity refers toconversion of assets into cash.
4. **Amount of fixed capital**: The amount of fixed capital of a company depends on a number of factors such as size of the company, nature of business, method of productionand so on. A manufacturing company such as steel factory may require relatively large finance when compared to a service organization such as a software company.
5. **Utilized for promotional and expansion**: The fixed capital is mostly needed at the time of promoting the company to purchase the fixed assets or at the time of expansion. In other words, the need for fixed capital arises less frequently.

Types of fixed assets

1. **Tangible fixed assets**: These are physical items which can be seen and touched. Most ofthe common fixed assets are land, buildings, machinery, motor vehicles, furniture and soon.
2. **Intangible fixed assets**: These do not have physical form. They cannot be seen or touched. But these are very valuable to business. Examples are goodwill, brand names, trademarks, patents, copy rights and so on.
3. **Financial fixed assets**: These are investments in shares, foreign currency deposits,government bonds , shares held by the business in other companies and so on.

WORKING CAPITAL

Working capital is the flesh and blood of the business. It is that portion of capital that makes a company work. It is not just possible to carry on the business with only fixed assets. Working capital is a must, working capital is also called circulating capital. It is used tomeet regular or recurring needs of the business. The regular needs refer to the purchase of materials, payment of wages and salaries, expenses like rent, advertising, power and so on.In short , working capital is the amounts needed to cover the cost of operating the business.

Definition of working capital

Working capital define as a current assets excess of current liabilities. Its also define in mathematically formula as

working capital = current assets – current liabilities

Features of working capital

Short life span: Working capital changes in its form cash to stock, stock to debtors, debtors to cash, the cash balances may be kept idle for a week or so, debtors have a life span of a few months , raw materials are held for a short – time until they go into production, finished goods as held for a short – time until they are sold.

Smoothly flow of operations: Adequate amount of working capital enables the businessto conduct its operations smoothly. It is therefore, called the flesh and blood of the business.

Liquidity: The assets represented by the working capital can be converted into cashquickly within a short period of time unlike fixed assets.

Amount of working capital: The amount of working capital of a business depends on many factors such as size and nature of the business, production and marketing policies, business cycles and so on.

Utilized for payment of current expenses: The working capital is used to pay for current expenses such as suppliers of raw materials, payment of wages and salaries, rent and other expenses and so on.

COMPONENTS OF WORKING CAPITAL:

Current assets: current assets are those assets which are converted into cash with in accounting period or within the year. For example, cash in hand, cash at bank, sundry debtor, bill receivable, prepaid expenses etc.

Current liabilities: current liabilities are those liabilities to pay outside with in the year. For example sundry creditor, bill payable, bank overdraft, outstanding expenses.

CLASSIFICATION OF WORKING CAPITAL

Working capital may be classified on the basis of its concepts as well as on the basis of its requirement or time. working capital can be classified into two categories, viz,

(A) Gross Working Capital,
(B) Net Working Capital
(C) Permanent Working Capital,
(D) Temporary Working Capital

Gross working capital:
In the broader sense, the term working capital refers to the gross working capital. The notion of the gross working capital refers to the capital invested in total current assets of the enterprise. Current assets are those assets, which in the ordinary course of business, can be converted into cash within a short period, normally one accounting year.

- Gross Working Capital = Total Value of Current Assets.
- Gross Working Capital Formula = Receivables + Inventory + Cash and Marketable Securities + Short Term Investments + Any other Current Asset.

Net working capital:

In a narrow sense, the term working capital refers to the net working capital. Networking capital represents the excess of current assets over current liabilities

- Net Working Capital = Current Assets – Current Liabilities
- Net Working Capital = Current Assets (less cash) – Current Liabilities (less debt)
- NWC = Accounts Receivable + Inventory – Accounts Payable

Permanent Working Capital:

It refers to the portion of investment in current assets which is required at all times to carry on the business operations at a minimum level. It represents the current assets required on a continuing basis over the entire year. It remains in the business in one form or another and also grows with the size of the business. Since it is permanently needed for business operations, permanent working capital should be financed out of long-term funds.

- Permanent Working Capital= Equity + Long Term Borrowings

Temporary Working Capital:

It is also called variable working capital. The amount of temporary working capital keeps on fluctuating with the increase or decrease in business activities. It represents additional current assets needed at different times during the operating year. Since it is required for carrying out seasonal and special operations of short duration such as extensive marketing campaigns, it should be financed from the short-term source of finance like bank credit.

- Temporary Working Capital = Current Assets – Current Liabilities

Factors determining the working capital requirements

1. **Nature or character of business**: The working capital requirements of a firm basically depend upon the nature of its business. Public utility undertakings like electricity, water supply and railways need very limited working capital as their sales are on cash and are engaged in provision of services only. On the other hand, trading firms require more investment in inventories, receivables and cash and such they need large amount of working capital. The manufacturing undertakings also require sizable working capital.
2. **Size of business or scale of operations**: The working capital requirements of a concern are directly influenced by the size of its business, which may be measured in terms of scale of operations. Greater the size of a business unit, generally, larger will be the requirements of working capital. However, in some cases, even a smaller concern may need more working capital due to high overhead charges, inefficient use of available resources and other economic disadvantages of small size.
3. **Production policy**: If the demand for a given product is subject to wide fluctuations dueto seasonal variations, the requirements of working capital, in such cases, depend upon the production policy. The production could be kept either steady by accumulating inventories during slack periods with a view to meet high demand during the peakseason or the production could be curtailed during

the slack season and increased during the peak season. If the policy is to keep the production steady by accumulating inventories it will require higher working capital.

4. **Manufacturing process/Length of production cycle**: In manufacturing business, the requirements of working capital will be in direct proportion to the length of manufacturing process. Longer the process period of manufacture, larger is the amount of working capital required, as the raw materials and other supplies have to be carried for a longer period.
5. **Seasonal variations:** If the raw material availability is seasonal, they have to be bought in bulk during the season to ensure an uninterrupted material for the production. A huge amount is, thus, blocked in the form of material, inventories during such season, which give rise to more working capital requirements. Generally, during the busy season, a firm requires larger working capital then in the slack season.
6. **Credit policy**: The credit policy of a concern in its dealings with debtors and creditors influences considerably the requirements of working capital. A concern that purchases its requirements on credit requires lesser amount of working capital compared to the firm, which buys on cash. On the other hand, a concern allowing credit to its customers shall need larger amount of working capital compared to a firm selling only on cash.
7. **Business cycles**: Business cycle refers to alternate expansion and contraction in general business activity. In a period of boom, i.e., when the business is prosperous, there is a need for larger amount of working capital due to increase in sales. On the contrary, in the times of depression, i.e., when there is a down swing of the cycle, the business contracts, sales decline, difficulties are faced in collection from debtors and firms may have to hold large amount of working capital.
8. **Rate of growth of business**: The working capital requirements of a concern increase with the growth and expansion of its business activities. The retained profits may provide for a part of working capital but the fast growing concerns need larger amount of working capital than the amount of undistributed profits.

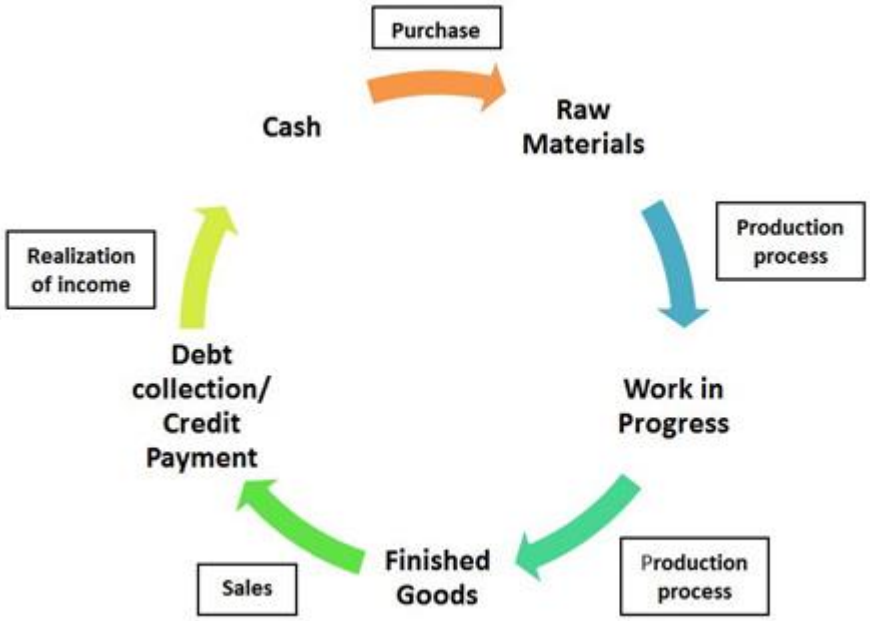
WORKING CAPITAL CYCLE

The main components of working capital management are inventories, receivables, cash and cash equivalents and current liabilities such as payables and short-term debt. All these components have a monetary and a temporal aspect to consider. The summary of all temporal components is referred to as "Working Capital Cycle".

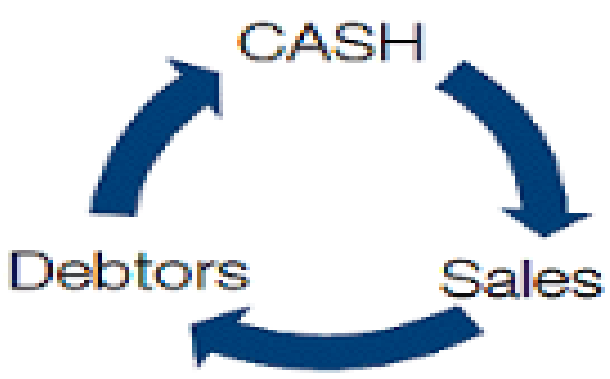
The goal of working capital management is to optimize the investment volume and investment duration, which usually means a minimization of working capital and a shortening of the recovery process.

In Manufacturing Concern,

The working capital cycle startswith the purchase of raw material and ends with the realization of cash from the sale of finished products. This cycle involves purchase of raw materials and stores, its conversion into stocks of finished goods through work–in progress with progressive increment of labour and service costs, conversion of finished stock into sales, debtors and receivables and ultimately realization of cash. This cycle continues again from cash to purchase of raw materials and so on.

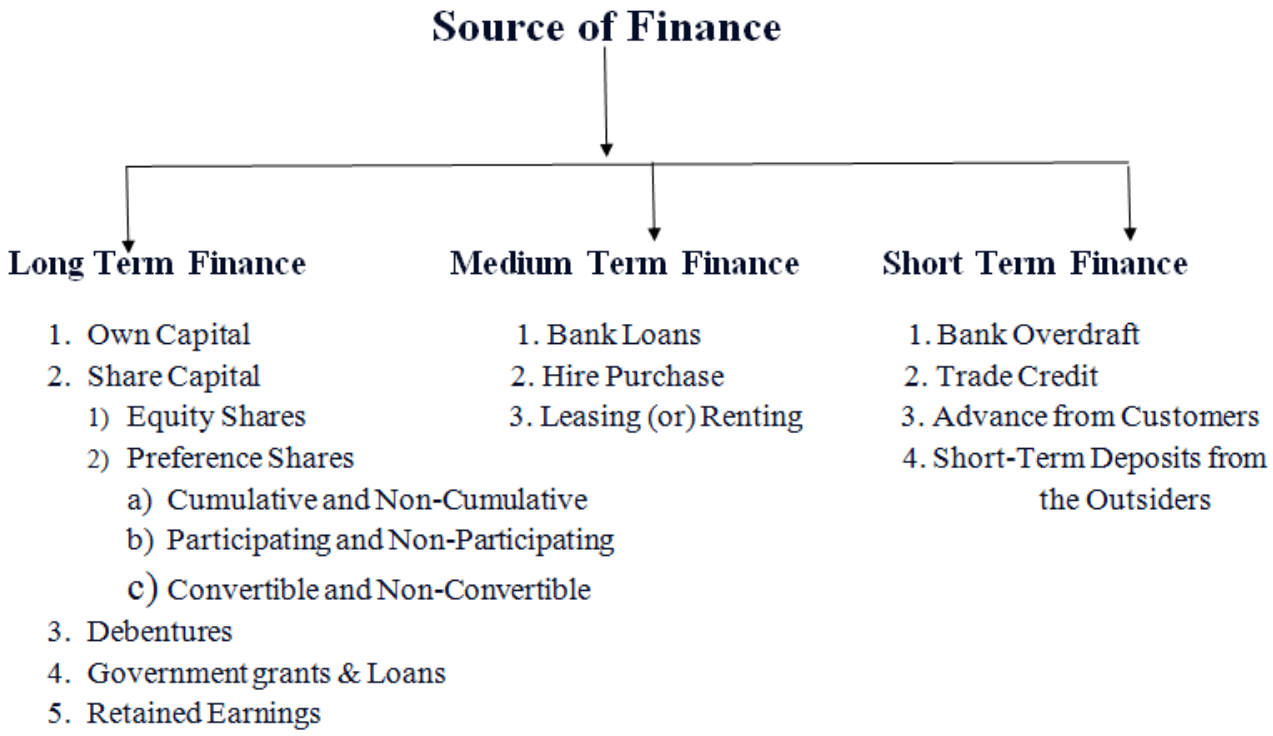


In Service Companies,



SOURCES OF FINANCE

1. Long term finance
2. Medium term finance
3. Short term finance



LONG TERM FINANCE

Long-term finance is that which is required for a long period of time, i.e. no less than 5 years. These long-term sources are generally required for the acquisition of fixed assets as these fixed assets are purchased for a long period and are also very expensive than current assets.

1. **Own capital**: Irrespective of the form of organization such as soletrader, partnership or a company, the owners of the business have to invest their own finances to start with. Money invested by the owners, partners or promoters is permanent and will stay withthe business throughout the life of business.
2. **Share capital**: Normally in the case of a company, the capital is raised by issue of shares. The capital so raised is called share capital. The share capital can be of twotypes, preference share capital and equity share capital.
   Broadly, there are two
   - Equity shares
   - Preference shares.

   a) **Equity shares**: Equity shares are also referred to as ordinary shares. They are one of the most common kinds of shares. These stocks are documents that give investors ownership rights of the company. Equity shareholders bear the highest risk. Owners of these shares have the right to vote on various company matters. Equity shares are also transferable and the dividend paid is

a proportion of profit. One thing to note, equity shareholders are not entitled to a fixed dividend. The liability of an equity shareholder is limited to the amount of their investment. However, there are no preferential rights in holding.

b) **Preference shares**: When a company is liquidated, the shareholders who hold preference shares are paid off first. They also have the right to receive profits of the company before the ordinary shareholders.

i) **Cumulative and non-cumulative preference shares:** In the case of cumulative preference share, when the company does not declare dividends for a particular year, it is carried forward and accumulated. When the company makes profits in the future, these accumulated dividends are paid first. In case of non-cumulative preference shares, dividends do not get accumulated, which means when there are no future profits, no dividends are paid.

ii) **Participating and non-participating preference shares**: Participating shareholders have the right to participate in remaining profits after the dividend has been paid out to equity shareholders. So in years where the company has made more profits, these shareholders are entitled to get dividends over and above the fixed dividend. Holders of non-participating preference shares, do not have a right to participate in the profits after the equity shareholders have been paid. So in case a company makes any surplus profit, they will not get any additional dividends. They will only receive their fixed share of dividends every year.

iii) **Convertible and non- convertible preference shares:** Here, the shareholders have an option or right to convert these shares into ordinary equity shares. For this, specific terms and conditions need to be met. Non-convertible preference shares do not have a right to be converted into equity shares.

3. **Debentures**: Debentures are the loans taken by the company. It is a certificate or letterby the company under its common seal acknowledging the receipt of loan. A debenture holder is the creditor of the company. A debenture holder is entitled to a fixed rate of interest on the debenture amount.
4. **Government grants and loans**: Government may provide long term finance directly to the business houses or by indirectly subscribing to the shares of the companies. The government gives loans only if the project satisfies certain conditions, such as setting up a project in a notified area, or ventures into projects which are beneficial for the society as a whole.
5. **Retained Earnings:** Retained earnings are the amount of profit a company has left over after paying all its direct costs, indirect costs, income taxes and its dividends to shareholders. This represents the portion of the company's equity that can be used, for instance, to invest in new equipment, R&D, and marketing. When accumulated year after year, retained earnings are known as "accumulated profits". Year after year, retained earnings are added to the balance sheet and become part of the company's equity with the money that was initially invested by shareholders.

MEDIUM TERM FINANCE

Medium-term sources of funds are usually for a period of more than one year but not exceeding five years in duration. These finances include, loan from commercial banks or financial institutions, lease financing, public deposits, etc.

1. **Bank loans:** Bank loans are extended at a fixed rate of interest. Repayment of the loan and interest are scheduled at the beginning and are usually directly debited to the current account of the borrower. These are secured loans.

2. **Hire purchase:** It is a facility to buy a fixed asset while paying the price over a long period of time. In other words , the possession of the asset can be taken by making a down payment of a part of the price and the balance will be repaid with a fixed rate of interest in agreed number of installments.
3. **Leasing or renting:** Where there is a need for fixed assets, the asset need not be purchased. It can be taken on lease or rent for specified number of years. The company who owns the assets is called lessor and the company which takes the asset on lease is called lessee. The agreement between the lessor and lessee is called a lease agreement.

SHORT TERM FINANCE

Short-term financing can be for periods as short as weeks (or even days), less than one year. Short-term financing is somewhat riskier than long-term, but it also tends to be less expensive and offers greater flexibility to the borrower.

1. **Bank overdraft:** This is special arrangement with the banker where the customer can draw more than what he has in his saving/ current account subject to a maximum limit. Interest is charged on a day to day basis on the actual amount overdrawn.
2. **Trade credit:** This is short term credit facility extended by the creditors to the debtors, normally; it is common for the traders to buy the materials and other supplies from the suppliers on credit basis. After selling the stocks the traders pay the cash and buy fresh stocks again on credit. Sometimes, the suppliers may insist on the buyer to sign a bill.
3. **Advance from customers:** It is customary to collect full or part of the order amount from the customers in advance. Such advances are useful to meet the working capital needs.
4. **Short term deposits from the outsiders:** There are various sources of raising finance for business and each of them has its own distinct characteristics merits and demerits. The basic task of finance manager is to ensure that the right quantity of finance is available from appropriate.

CAPITAL BUDGETING

Capital budgeting is the process of making investment decision in long-term assets or courses of action. Capital expenditure incurred today is expected to bring its benefits over a period of time. These expenditures are related to the acquisition & improvement of fixes assets.

Capital budgeting is the planning of expenditure and the benefit, which spread over a number of years. It is the process of deciding whether or not to invest in a particular project, as the investment possibilities may not be rewarding. The manager has to choose a project, which gives a rate of return, which is more than the cost of financing the project. For this the manager has to evaluate the worth of the projects in-terms of cost and benefits. The benefits are the expected cash inflows from the project, which are discounted against a standard, generally the cost of capital.

CAPITAL BUDGETING PROCESS:

A) **Project identification and generation**:
The first step towards capital budgeting is to generate a proposal for investments. There could be various reasons for taking up investments in a business. It could be addition of a new product line or expanding the existing one. It could be a proposal to either increase the production or reduce the costs of outputs.

B) **Project Screening and Evaluation**:
This step mainly involves selecting all correct criteria's to judge the desirability of a proposal. This has to match the objective of the firm to maximize its market value. The tool of time value of money comes handy in this step.
Also the estimation of the benefits and the costs needs to be done. The total cash inflow and outflow along with the uncertainties and risks associated with the proposal has to be analyzed thoroughly and appropriate provisioning has to be done for the same.

C) **Project Selection**:
There is no such defined method for the selection of a proposal for investments as different businesses have different requirements. That is why, the approval of an investment proposal is done based on the selection criteria and screening process which is defined for every firm keeping in mind the objectives of the investment being undertaken.
Once the proposal has been finalized, the different alternatives for raising or acquiring funds have to be explored by the finance team. This is called preparing the capital budget. The average cost of funds has to be reduced. A detailed procedure for periodical reports and tracking the project for the lifetime needs to be streamlined in the initial phase itself. The final approvals are based on profitability, Economic constituents, viability and market conditions.

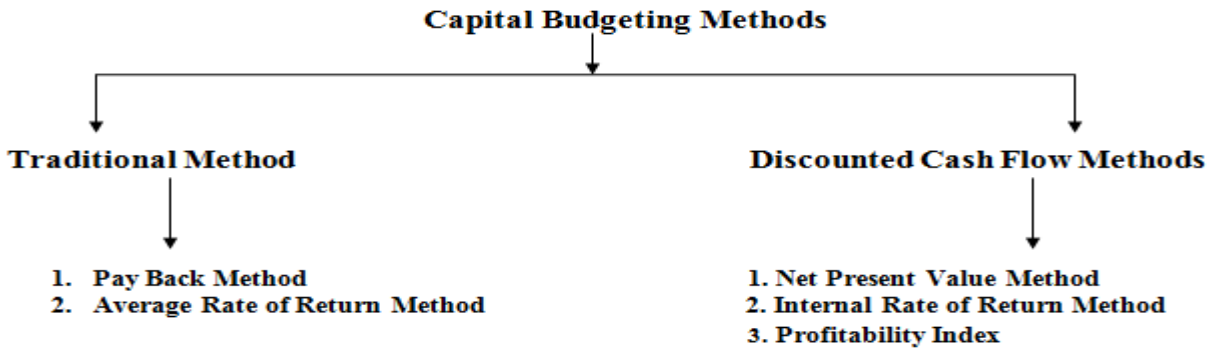
D) **Implementation**:
Money is spent and thus proposal is implemented. The different responsibilities like implementing the proposals, completion of the project within the requisite time period and reduction of cost are allotted. The management then takes up the task of monitoring and containing the implementation of the proposals.

E) **Performance review:**
The final stage of capital budgeting involves comparison of actual results with the standard ones. The unfavorable results are identified and removing the various difficulties of the projects helps for future selection and execution of the proposals.

Capital Budgeting Methods:

The methods of capital budgeting can be classified into two types:

1. Traditional, and
2. Discounted cash flow



1. Traditional Method:

These methods are based on the principles to determine the desirability of an investment project on the basis of its useful life and expected returns. These methods depend upon the accounting information available from the books of accounts of the company. These will not take into account the concept of „time value of money", which is a significant factor to determine the desirability of a project in terms of present value.

(a) Pay Back Method:

This is the traditional method, simplest and the most widely used method for appraising capital expenditure decisions. The term pay back or pay out or pay off, refers to the period in which the project will generate the required CFAT (that is, cash flows, after taxes) to recoup the initial investment. There are two methods of calculating the payback period.

i) When Cash Flows are Uniform:

If the cash flows are uniform for each year of the project's life, that is, if CFAT's are uniform, then the payback period is calculated using the equation –

Payback period = Initial Investment / annual cash inflow

(ii) Uneven Cash Inflows:

In this situation, payback period is calculated by the process of cumulative cash flows, till the time when cumulative cash flows become equal to the original investment.

$$\text{Payback period} = \text{Lowest year} + \frac{\text{Initial Investment} - \text{Lowest Cumulative Value}}{\text{Highest Cumulative Value} - \text{Lowest Cumulative Value}}$$

Accept-Reject Criterion as per the Pay Back Period:

The payback period can be used as a criterion to accept or reject an investment proposal.

Advantages of Pay Back Period Method:

(i) This method is very useful in evaluating projects which involve high uncertainty. Due to the risks and uncertainty involved, payback period rejects projects with a payback period over five years.
(ii) Secondly, the firm will start getting profits once the payback period is over. So the firms can plan their profit appropriation in advance.
(iii) This method reduces the possibility of loss on account of obsolescence because as per this method, earlier benefits are better than later benefits and investment decisions are made accordingly.

Disadvantages of Pay Back Period Method:

(i) The first drawback of this method is that it completely ignores all cash inflows after the payback period. As per this method, projects having long gestation period are always rejected, even if the project may give high returns for a long period,
(ii) This method does not take into account time value of money. In other words, this method ignores the fact that a rupee tomorrow, is worth less than a rupee today.

(b) Average Rate of Return Method (ARR Method):

The accounting rate of return (ARR) method is also known as the Return on Investment (ROI) method. This method uses accounting information as revealed by the financial statements, to measure the profitability of an investment.

$$\text{ARR} = \frac{\text{Average annual cash inflows}}{\text{Average Investment}} \times 100$$

$$\text{Average annual cash inflows} = \frac{\text{Total cash inflows}}{\text{No. of Years}}$$

$$\text{Average Investment} = \frac{\text{Original Investment}}{2}$$

Accept Reject Rule as per ARR Method:

Accept if ARR > Minimum Rate and Reject if ARR < Minimum Rate

Advantages of ARR Method:

(i) This method is simple to calculate if accounting profits after taxes are easily obtainable, moreover, it is simple to understand and use.

(ii) The total benefits from the project are taken into account for calculating ARR, whereas, in the case of Pay Back Period, benefits after the payback period are not considered.

Disadvantages of ARR Method:

(i) As per this method, calculation is based on the accounting profit instead of cash flows. It has been already explained, of the superiority of cash flows over accounting profit in capital budgeting decisions.

(ii) Secondly, this method ignores the time value of money. Accordingly benefits in the earlier years and later years are valued equally. This is another drawback of ARR method.

(iii) Thirdly, the ARR method of measuring the worth of the investment does not differentiate between the sizes of the investment required, for each project.

2. Discounted Cash Flow Methods:

These methods are also known as time adjusted techniques. These methods take into consideration, the time value of money while evaluating the costs and benefits of a project, that is, the cash flows associated with the project, are discounted at the cost of capital. Another important feature of discounted cash flow method, is that it takes into account all benefits and costs, occurring during the entire life of the project.

(a) NPV Method or Net Present Value Method:

The calculation can be divided into two stages. The first stage involves the determination of an appropriate rate of discount. Generally cost of capital is used as the discounting rate. Then the cash inflows and outflows associated with each project are worked out, and the difference between the two is the Net Present Value or NPV.

Thus NPV may be defined as, “the summation of the present values of the cost proceeds (CFAT) in each year, minus the summation of present values of the net cash outflows in each year”.

Net Present Value Method = Total Present Value of Cash Flows- Present value of cash out flows

Advantages of NPV Method:
(i) This method considers all cash flows.
(ii) This method recognises the time value of money.
(iii) This method is consistent with the wealth maximisation principle.
(iv) This method is more scientific and dependable.
(v) This method makes it possible to compare projects requiring different capital outlays, having different number of years of life, different timings of cash flows, all at a particular moment of time, by discounting all the cash flows.
(vi) This method is particularly useful for the selection of mutually exclusive projects.

Disadvantages of NPV Method:
(i) This method is difficult to calculate and understand with the calculations involved.
(ii) This method requires estimates of cash flows, which is a tedious task.
(iii) Another drawback of this method is the calculation of the required rate of return, to discount the cash flows. Moreover, different discount rates will give different present values and the relative desirability of a proposal will change with a change in the discount rate.
(iv) While deciding in the case of two projects, this method will favour the project which has the higher NPV. But it also possible, that this project may require larger initial outlay. Thus, in the case of projects involving different outlays, the present value method may not give dependable results.

Accept-Reject Rule as per NPV Method:
The decision rule for a project under NPV method, is to accept the project if the NPV is positive, and reject if it is negative. Symbolically –
NPV > Zero- accept
NPV < Zero- reject.
In the case of mutually exclusive projects, project with the highest positive NPV is accepted.

(b) Internal Rate of Return Method:

Internal rate of return is the rate at which the total of discounted cash inflows equals the total discounted cash outflows-that is, the rate of discount which reduces the net present value of an investment to zero, it is defined as "the discount rate which equates the aggregate present value of the net cash inflows (CFAT), with the aggregate present value of cash outflows of a project." In other words, internal rate of return is usually the rate of return that a project earns.

Advantages of IRR Method:
(i) This method is easy to calculate and makes it simple to evaluate the investment proposals.
(ii) This method considers the time value of money.
(iii) This method considers all cash flows.
(iv) This method is not in conflict with the concept of maximizing the wealth of the equity shareholders.

Disadvantages of IRR Method:
(i) This method requires the estimates of all cash inflows, which is a tedious work.

(ii) The result of IRR Method may be sometimes in conflict, with the result of NPV method. This is especially true in case of mutually exclusive projects, where IRR method may suggest to accept one project and the NPV method may suggest to reject the project.

(c) Profitability Index:

Profitability Index (PI) is the ratio of investment to payoff of a suggested project. It is a useful capital budgeting technique for grading projects, because it measures the value created by per unit of investment made by the investor. This technique is also known as Profit Investment Ratio (PIR), Benefit-Cost Ratio and Value Investment Ratio (VIR).

The ratio is calculated as follows:

$$\textbf{Profitability Index} = \frac{\textbf{Total Present Value of Cash Flows}}{\textbf{Present value of cash out flows}}$$

Accept-Reject Rule:

If Profit Index is greater than one, then project should be accepted.

If Profit Index is less than one, then reject the project.

NPV vs IRR Debate:

Net Present Value Method:

When the present value of the all the future cash flows generated from a project is added together (whether they are positive or negative) the result obtained will be the Net Present Value or NPV. The concept is having great importance in the field of finance and investment for taking important decisions relating to cash flows generating over multiple years. NPV constitutes shareholder's wealth maximization which is the main purpose of the Financial Management.

Internal Rate of Return Method:

IRR for a project is the discount rate at which the present value of expected net cash inflows equates the cash outlays. To put simply, discounted cash inflows are equal to discounted cash outflows. It can be explained with the following ratio, **(Cash inflows / Cash outflows) = 1.**

Comparison Chart:

BASIS FOR COMPARISON	NPV	IRR
Meaning	The total of all the present values of cash flows (both positive and negative) of a project is known as Net Present Value or NPV.	IRR is described as a rate at which the sum of discounted cash inflows equates discounted cash outflows.
Expressed in	Absolute terms	Percentage terms
What it represents?	Surplus from the project	Point of no profit no loss (Breakeven point)
Decision Making	It makes decision making easy.	It does not help in decision making
Rate for reinvestment of intermediate cash flows	Cost of capital rate	Internal rate of return
Variation in the cash outflow timing	Will not affect NPV	Will show negative or multiple IRR

PROBLEMS

1. A company is considering two investment opportunities A and B that cost Rs.4, 00,000 and Rs.3, 00,000 respectively. The first project generates Rs.1, 00,000 per year for 4 years. The second generates Rs.6, 00,000, Rs.1, 00,000, Rs.80, 000, Rs.90, 000 and Rs.70, 000 over a five years period. The company's cost of capital is 10%. Which project would you choose under NPV method?

Sol:

Given,

Two investment opportunities A and B that cost Rs.4, 00,000 and Rs.3, 00,000
The first project generates Rs.1, 00,000 per year for 4 years.
The second generates Rs.6, 00,000, Rs.1, 00,000, Rs.80, 000, Rs.90, 000 and Rs.70, 000.
Company's cost of capital is 10%.

Net Present Value Method = Total Present Value of Cash Flows- Present value of cash out flows

Opportunity A:

Years	Cash Inflows	Discount Factor (10%)	Present Value Of Inflows
1	1,00,000	0.909	90,900
2	1,00,000	0.826	82,600
3	1,00,000	0.751	75,100
4	1,00,000	0.683	68,300
TOTAL PRESENT VALUE OF CASH INFLOWS		=	3,16,900

Net Present Value Method = Total Present Value of Cash Flows- Present value of cash out flows

= 3,16,900 – 4,00,000

= -83,100

Opportunity B:

Years	Cash Inflows	Discount Factor (10%)	Present Value Of Inflows
1	60,000	0.909	54,540
2	1,00,000	0.826	82,600
3	80,000	0.751	60,080
4	90,000	0.683	61,470
5	70,000	0.620	43,400
TOTAL PRESENT VALUE OF CASH INFLOWS		=	3,02,090

Net Present Value Method = Total Present Value of Cash Flows- Present value of cash out flows

= 3,02,090– 3,00,000

= 2,090

CONCLUSION:

Select Opportunity 'B' because it generates positive value when compared to Opportunity 'A'. In NPV method, we need to accept only positive value.

2. Determine the Payback Period and ARR from the following. The project cost is Rs.20, 000, Life of Project is 5 years, and Cash flows for 5 years are Rs.10,000, Rs.12,000, Rs.13,000, Rs.11,000 and Rs.10,000.

Sol: Given,

The project cost is Rs.20, 000.
Life of Project is 5 years.
Cash flows for 5 years are Rs.10,000, Rs.12,000, Rs.13,000, Rs.11,000 and Rs.10,000.

Payback Period:

Years	Annual Cash Inflows	Cumulative Cash Inflows
1	10,000	10,000
2	12,000	22,000
3	13,000	35,000
4	11,000	46,000
5	10,000	56,000

Payback period= Lowest year+ Initial Investment- Lowest Cumulative Value
Highest Cumulative Value-Lowest Cumulative Value

$= 1+\frac{20,000-10,000}{22,000-10,000}$

$= 1+\frac{10,000}{12,000}$

$= 1+ 0.833$

$= 1.833 \simeq 1.8$ years

Average Rate of Return:

$$\textbf{ARR} = \frac{\textbf{Average annual cash inflows}}{\textbf{Average Investment}} \times 100$$

$$\textbf{Average annual cash inflows} = \frac{\textbf{Total cash inflows}}{\textbf{No. of Years}}$$

$$= \frac{56,000}{5}$$

$$= 11,200$$

$$\textbf{Average Investment} = \frac{\textbf{Original Investment}}{\textbf{2}}$$

$$= \frac{20,000}{2}$$

$$= 10,000$$

∴ **Average Rate of Return =** $\frac{11,200}{10,000} \times 100$

$= 1.12 \times 100$

$= 112\ \%$

3. Compute ARR for Project A and B from the following.

Particulars	**Project-A**	**Project-B**
Investment	10,000	12,000
Expected Life	5 Years	5 Years

Project net income after tax as follows.

Year	**Project-A**	**Project-B**
1	4,000	6,000
2	3,000	6,000
3	3,000	4,000
4	2,000	2,000
5	3,000	2,000

Sol:

Project-A:

$$\textbf{ARR} = \frac{\textbf{Average annual cash inflows}}{\textbf{Average Investment}} \times 100$$

$$\textbf{Average annual cash inflows} = \frac{\textbf{Total cash inflows}}{\textbf{No. of Years}}$$

$= \frac{15,000}{5}$

$= 3,000$

$$\textbf{Average Investment} = \frac{\textbf{Original Investment}}{\textbf{2}}$$

$= \frac{10,000}{2}$

$= 5,000$

∴ **Average Rate of Return =** $\frac{3,000}{5,000} \times 100$

$= 0.6 \times 100$

$= 60\ \%$

Project-B:

$$\text{ARR} = \frac{\text{Average annual cash inflows}}{\text{Average Investment}} \times 100$$

$$\text{Average annual cash inflows} = \frac{\text{Total cash inflows}}{\text{No. of Years}}$$

$$= \frac{20,000}{5}$$

$$= 4,000$$

$$\text{Average Investment} = \frac{\text{Original Investment}}{2}$$

$$= \frac{12,000}{2}$$

$$= 6,000$$

$$\therefore \text{Average Rate of Return} = \frac{4,000}{6,000} \times 100$$

$$= 0.66 \times 100$$

$$= 66\ \%$$

4. Coastal software Ltd. is proposing to mechanize their operations.
Two proposals M and N in the form of quotations have been received from two different vendors. The proposal in each case costs Rs.5, 00,000. A discount factor of 12% is used to compare the proposals. CFAT are likely to be as under:

Year	Proposal M	Proposal N
1	1,50,000	50,000
2	2,00,000	1,50,000
3	2,50,000	2,00,000
4	1,50,000	3,00,000
5	1,00,000	2,00,000

Which one do you recommend under:
a) Payback period method.
b) ARR method.
c) Net present value method
d) Profitability index

Sol:

Given,

Two proposals M and N in the form of quotations have been received from two different vendors. The proposal in each case costs Rs.5, 00,000.
A discount factor of 12% is used to compare the proposals.

Proposal - M:

a) Payback Period Method:

Year	Annual cash inflows	Cumulative cash inflows
1	1,50,000	1,50,000
2	2,00,000	3,50,000
3	2,50,000	6,00,000
4	1,50,000	7,50,000
5	1,00,000	8,50,000

Payback period= Lowest year+ Initial Investment- Lowest Cumulative Value
Highest Cumulative Value-Lowest Cumulative Value

$= 2+\frac{5,00,000-3,50,000}{6,00,000-3,50,000}$

$= 2+ \frac{1,50,000}{2,50,000}$

$= 2+ 0.6$

$= 2.6$ years

b) ARR Method:

ARR= Average annual cash inflows ×100
Average Investment

Average annual cash inflows= Total cash inflows
No. of Years

$= \frac{8,50,000}{5}$

$= 1,70,000$

Average Investment= Original Investment
2

$= \frac{5,00,000}{2}$

$= 2,50,000$

∴ **Average Rate of Return** $= \frac{1,75,000}{2,50,000} \times 100$

$= 0.68 \times 100$

$= 68\ \%$

C) Net Present Value Method:

Years	Cash Inflows	Discount Factor (12%)	Present Value Of Inflows
1	1,50,000	0.892	1,33,800
2	2,00,000	0.797	1,59,400
3	2,50,000	0.711	1,77,750
4	1,50,000	0.635	95,250
5	1,00,000	0.567	56,700
TOTAL PRESENT VALUE OF CASH INFLOWS		=	6,22,900

Net Present Value Method = Total Present Value of Cash Flows- Present value of cash out flows

= 6,22,900– 5,00,000

= 1,22,900

d) Profitability index:

Profitability Index = Total Present Value of Cash Flows
Present value of cash out flows

= 6,22,900
5,00,000

= 1.2458

Proposal - N:

a) Payback Period Method:

Year	Annual cash inflows	Cumulative cash inflows
1	50,000	1,50,000
2	1,50,000	2,00,000
3	2,00,000	4,00,000
4	3,00,000	7,00,000
5	2,00,000	9,00,000

Payback period= Lowest year+ Initial Investment- Lowest Cumulative Value
Highest Cumulative Value-Lowest Cumulative Value

= 3+5,00,000-4,00,000
7,00,000-4,00,000

= 3+ 1,00,000
3,00,000

= 3+ 0.3

= 3.3 years

b) ARR Method:

$$\text{ARR} = \frac{\text{Average annual cash inflows}}{\text{Average Investment}} \times 100$$

$$\text{Average annual cash inflows} = \frac{\text{Total cash inflows}}{\text{No. of Years}}$$

$$= \frac{9,00,000}{5}$$

$$= 1,80,000$$

$$\text{Average Investment} = \frac{\text{Original Investment}}{2}$$

$$= \frac{5,00,000}{2}$$

$$= 2,50,000$$

$$\therefore \text{Average Rate of Return} = \frac{1,80,000}{2,50,000} \times 100$$

$$= 0.72 \times 100$$

$$= 72\ \%$$

C) Net Present Value Method:

Years	Cash Inflows	Discount Factor (12%)	Present Value Of Inflows
1	50,000	0.892	44,600
2	1,50,000	0.797	1,19,550
3	2,00,000	0.711	1,42,200
4	3,00,000	0.635	1,90,500
5	2,00,000	0.567	1,13,400
TOTAL PRESENT VALUE OF CASH INFLOWS		=	6,10,250

Net Present Value Method = Total Present Value of Cash Flows- Present value of cash out flows

$$= 6,10,250 - 5,00,000$$

$$= 1,10,250$$

d) Profitability index:

$$\text{Profitability Index} = \frac{\text{Total Present Value of Cash Flows}}{\text{Present value of cash out flows}}$$

$$= \frac{6,10,250}{5,00,000}$$

$$= 1.2205$$

NET PRESENT VALUES(DISCOUNT FACTOR) **DF=1/(1+r)^n**

n/r	1	2	3	4	5	6	7	8	9	10
1%	0.990	0.980	0.970	0.960	0.951	0.942	0.932	0.923	0.914	0.905
2%	0.980	0.961	0.942	0.923	0.905	0.887	0.870	0.853	0.836	0.820
3%	0.970	0.942	0.915	0.888	0.862	0.837	0.813	0.789	0.766	0.744
4%	0.961	0.924	0.888	0.854	0.821	0.790	0.759	0.730	0.702	0.675
5%	0.952	0.907	0.863	0.822	0.783	0.746	0.710	0.676	0.644	0.613
6%	0.943	0.889	0.839	0.792	0.747	0.704	0.665	0.627	0.591	0.558
7%	0.934	0.873	0.816	0.762	0.712	0.666	0.622	0.582	0.543	0.523
8%	0.925	0.857	0.793	0.735	0.680	0.630	0.583	0.540	0.500	0.463
9%	0.917	0.841	0.772	0.708	0.649	0.596	0.547	0.501	0.460	0.422
10%	0.909	0.826	0.751	0.683	0.620	0.564	0.513	0.466	0.424	0.385
11%	0.900	0.811	0.731	0.658	0.593	0.534	0.481	0.433	0.390	0.352
12%	0.892	0.797	0.711	0.635	0.567	0.506	0.452	0.403	0.360	0.321
13%	0.884	0.783	0.693	0.613	0.542	0.480	0.425	0.376	0.332	0.332
14%	0.877	0.769	0.675	0.592	0.519	0.455	0.399	0.350	0.307	0.262
15%	0.869	0.756	0.657	0.571	0.497	0.432	0.375	0.326	0.284	0.247
16%	0.862	0.743	0.664	0.552	0.476	0.410	0.353	0.305	0.262	0.226
17%	0.854	0.731	0.624	0.534	0.456	0.389	0.333	0.284	0.243	0.208
18%	0.847	0.718	0.608	0.515	0.437	0.370	0.313	0.266	0.225	0.191
19%	0.840	0.706	0.593	0.498	0.419	0.352	0.295	0.248	0.208	0.175
20%	0.833	0.694	0.578	0.482	0.401	0.334	0.279	0.232	0.193	0.161
21%	0.826	0.683	0.564	0.466	0.385	0.318	0.263	0.217	0.179	0.148
22%	0.819	0.671	0.55	0.451	0.369	0.303	0.248	0.203	0.167	0.136
23%	0.813	0.660	0.537	0.436	0.355	0.288	0.234	0.190	0.155	0.126
24%	0.806	0.65	0.524	0.422	0.341	0.275	0.221	0.178	0.144	0.116
25%	0.8	0.64	0.512	0.409	0.327	0.262	0.209	0.167	0.134	0.107
26%	0.793	0.629	0.499	0.396	0.314	0.249	0.198	0.157	0.124	0.099
27%	0.787	0.620	0.488	0.384	0.302	0.238	0.187	0.147	0.116	0.091
28%	0.781	0.610	0.476	0.372	0.291	0.227	0.177	0.138	0.108	0.084
29%	0.775	0.600	0.465	0.361	0.279	0.217	0.168	0.130	0.101	0.078
30%	0.769	0.591	0.455	0.350	0.269	0.207	0.159	0.122	0.094	0.072

2 MARKS QUESTIONS

1. **What is capital?**

Capital is the money or resources that are used to start a business. Capital is the resource that can be money in the form of cash or kind which is used to further purchase raw materials and inputs. It is an extremely important part as every business needs some amount of capital in the beginning.

Capital is divided into two major types they are

A) fixed capital B) working capital

2. **Define fixed capital?**

Fixed capital is that portion of capital which invested in acquiring long term assets such as land and buildings, plant and machinery, furniture and fixtures, and so on, fixed capital forms the skeleton of the business. It provides the basic assets as per the business needs.

3. **What is working capital?**

Working capital is also called circulating capital. It is used to meet regular or recurring needs of the business. The regular needs refer to the purchase of materials, payment of wages and salaries, expenses like rent, advertising, and power and so on. In short, working capital is the amounts needed to cover the cost of operating the business. Working capital is the flesh and blood of the business.

4. **Define current assets?**

Current assets are those assets which are converted into cash with in accounting period or within the year. For example, cash in hand, cash at bank, sundry debtor, bill receivable, prepaid expenses etc.

5. **What is share?**

Normally in the case of a company, the capital is raised by issue of shares. Share is a part of total company's capital, total capital is divided into parts is called share. The capital so raised is called share capital. The share capital can be of two types, preference share capital and equity share capital.

Broadly, there are two

- Equity shares
- Preference shares.

6. **Define debentures?**

Debentures are the loans taken by the company. It is a certificate or letter by the company under its common seal acknowledging the receipt of loan. A debenture holder is the creditor of the company. A debenture holder is entitled to a fixed rate of interest on the debenture amount.

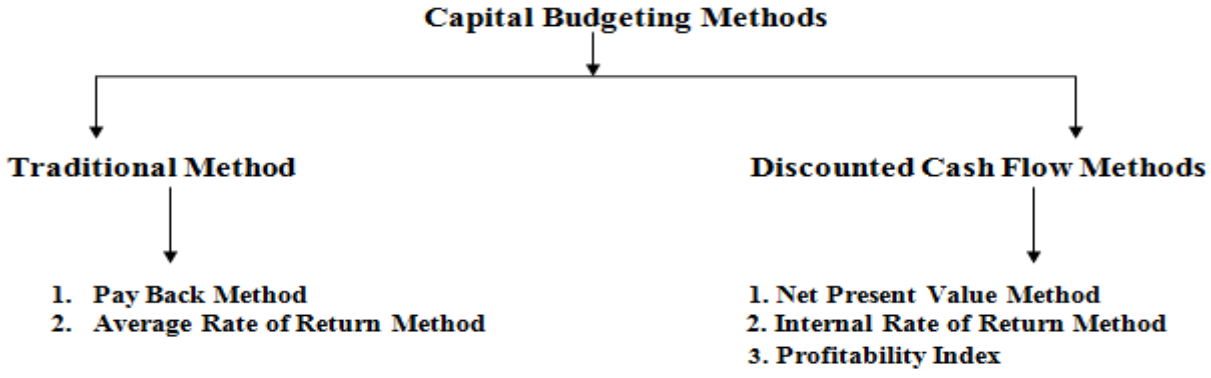
7. **What is capital budgeting?**

Capital budgeting is the process of making investment decision in long-term assets or courses of action. Capital expenditure incurred today is expected to bring its benefits over a period of time. These expenditures are related to the acquisition & improvement of fixes assets. The manager has to choose a project, which gives a rate of return, which is more than the cost of financing the project.

8. **What are the capital budgeting methods?**

The methods of capital budgeting can be classified into two types:

1. Traditional, and
2. Discounted cash flow



9. What is discounting cash flow method?

Discounting cash flow methods are also known as time adjusted techniques. These methods take into consideration, the time value of money while evaluating the costs and benefits of a project, that is, the cash flows associated with the project, are discounted at the cost of capital. Another important feature of discounted cash flow method, is that it takes into account all benefits and costs, occurring during the entire life of the project.

10. What is PV factor?

The present value factor is also called discounting factor. It is used to discount the future cash flows (both in-flows & out-flows) to their present value. The present value of Re.1 over a period of time for different discounting factors used table is PV FACTOR table.

11. What are the cash inflows?

Cash Inflows refers to cash receipts. It does not refer to future incomes. It may be calculated for a particular project or asset or for the whole business for one year or series of years.

12. What is trade credit?

Credit is a common source of short-term finance available to all companies. It refers to the amount payable to the suppliers of raw materials, goods etc. after an agreed period, which is generally less than a year.

13. What is payback period?

This is the traditional method, simplest and the most widely used method for appraising capital expenditure decisions. The term pay back or pay out or pay off, refers to the period in which the project will generate the required CFAT (that is, cash flows, after taxes) to recoup the initial investment. There are two methods of calculating the payback period.

14. Write formula of accounting rate of return?

The accounting rate of return (ARR) method is also known as the Return on Investment (ROI) method. This method uses accounting information as revealed by the financial statements, to measure the profitability of an investment.

$$ARR = \frac{\text{Average annual cash inflows}}{\text{Average Investment}} \times 100$$

$$\text{Average annual cash inflows} = \frac{\text{Total cash inflows}}{\text{No. of Years}}$$

$$\text{Average Investment} = \frac{\text{Original Investment}}{2}$$

15. How to calculate net present value?

NPV may be defined as, "the summation of the present values of the cost proceeds (CFAT) in each year, minus the summation of present values of the net cash outflows in each year".

Net Present Value Method = Total Present Value of Cash Flows- Present value of cash out flows

16. How to calculate internal rate of return?

The IRR for an investment proposal is that discount rate which equates the present value of cash inflows with the present value of cash out flows of an investment. The IRR is also known as cutoff or handle rate.

$$IRR = L + \frac{P1 - Q}{P1 - P2} \times D$$

17. Explain the process of capital budgeting?

Capital Budgeting Process

- Project identification and generation
- Project Screening and Evaluation
- Project Selection
- Implementation
- Performance review

18. What are the steps involved in capital budgeting process?

Capital Budgeting Process

1. Project identification and generation
2. Project Screening and Evaluation
3. Project Selection
4. Implementation
5. Performance review