

CHAPTER 2 INVESTMENT DECISIONS: CAPITAL BUDGETING

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ANALYSIS OF CAPITAL BUDGETING, DECISIONS AND CASE STUDIES

"Capital Budgeting is long term planning for making and financing proposed capital outlays"

– Charles T. Horngreen

TIME VALUE OF MONEY

Money has a "time value." That is to say that money in hand today is worth more than same amount of money received in the future because of four primary reasons

Presence of positive rates of inflation which reduce the purchasing power of rupees through time.

Future values are in some sense only promises, and contain some uncertainty about their occurrence. As a result of the risk of default or non-performance of an investment, a rupee in hand today is worth more than an expected rupee in the future.

The opportunity cost of lost earnings that it could have earned a return between today and a point in time in the future.

Finally, human preferences typically involve impatience, or the preference to consume goods and services now rather than in the future.

CAPITAL BUDGETING

DEFINITIONS

- **Charles T. Horngreen**, - "Capital budgeting is a long-term planning for making and financing proposed capital outlays".
- **G. C. Philippatos**, - "Capital budgeting is concerned with the allocation of the firms source financial resources among the available opportunities".
- **Richard and Green law**, - "Capital budgeting is acquiring inputs with long-term return"
- **Lyrich**, - "Capital budgeting consists of planning development of available capital for the purpose of maximizing the long-term profitability of the concern".

CAPITAL BUDGETING-PLANNING AND CONTROL OF CAPITAL EXPENSES

Capital budgeting is "firm's formal process for acquisition and investment of capital."The basic feature of capital budgeting decisions are;

- | | | |
|--|---|---|
| (1) current funds are exchanged for future benefits; | (2) there is an investment in long-term activities; and | (3) the future benefits will occur to the firm over series of years |
|--|---|---|

NEED FOR CAPITAL INVESTMENT

The following factors give rise to the need for capital investments:

- | | |
|---|-------------------------------|
| (a) Wear and tear of old Equipments | (e) Learning-curve effect. |
| (b) Obsolescence | (f) Expansion. |
| (c) Variation in product demand necessitating change in volume of production. | (g) Change of plant site. |
| (d) Product improvement requiring capital additions. | (h) Diversification. |
| | (i) Productivity improvement. |

Short Run & Long run Market forecast

Cash flow Budget

Non-economic factors

Fiscal incentives like Tax savings, depreciation allowance

IMPORTANCE OF CAPITAL BUDGETING

A capital budgeting decision should be made wisely because :

- ❖ It has long-term Implications :
- ❖ Involvement of large amount of funds:
- ❖ Irreversible decisions
- ❖ Risk and uncertainty :
- ❖ Difficult to make:

FACTORS INFLUENCING INVESTMENT DECISION

RATIONALE / BENEFITS OF CAPITAL BUDGETING DECISION

Investment decisions affecting revenue

• **Tactical investment decisions:** Small amount of funds and does not constitute a major departure from past.

Investment decisions reducing costs

• **Strategic investment decisions:** Major departure from past and likely to lead to evaluation of the company.

KINDS OF CAPITAL BUDGETING DECISION

(i) **Accept-reject decisions:** Business firm is confronted with alternative investment proposals. If the proposal is accepted, the firm incur the investment and not otherwise

(ii) **Mutually exclusive decisions:** It includes projects which compete with each other in a way that acceptance of one precludes others.

(iii) **Capital rationing decisions:** It is concerned with the selection of a group of investment out of many investment proposals ranked in the descending order of the rate of return, as the company has limited funds to invest

PLANNING OF CAPITAL EXPENDITURE

- **As regards long-term plan budget**, the period covered under the planning is three to five or more years.
- **As regards short-period Capital budgeting**, period covered within one or two years. Short-term capital expenditure plan is known as operating budget and is concerned with revenues and expenses related to firms daily operations. The most important factor is the rate of change in technology in the industry.

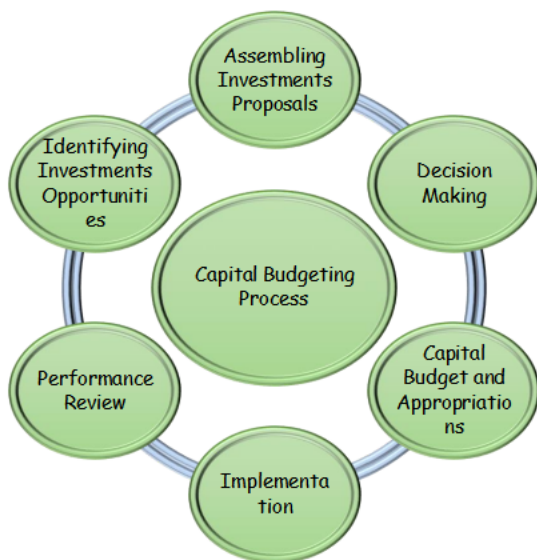
CAPITAL BUDGETING PROCESS

Planning and control are inter-linked and consecutive steps. Control assess the divergences between the expected and achieved results.

It may be recalled that capital expenditure is classified into three main forms viz.:

- (1) expenditure made to reduce costs;
- (2) expenditure made to increase revenue;
- (3) expenditure which is justified on non-economic grounds.

CAPITAL BUDGETING PROCESS



INVESTMENT CRITERIA

A sound investment criterion at least should provide the following:

1. A means of distinguishing between acceptable and non-acceptable projects;

2. Ranking of projects in order of their desirability;

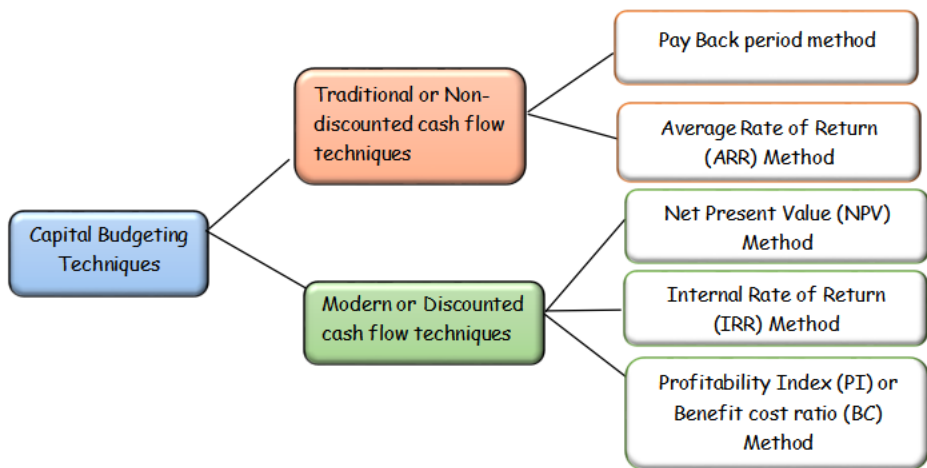
3. Choice among several alternatives;

4. A criteria which is applicable to any conceivable investment project independent of others;

5. Recognising the fact that the bigger benefits are preferable to smaller one and early benefits are preferable to later benefits;

6. Helping to choose among mutually exclusive projects, one which maximises the shareholders wealth.

CAPITAL BUDGETING TECHNIQUES



Traditional or Non - Discounted Cash Flow Techniques

This technique estimates the time required by the project to recover, through cash inflows (CFAT), the firm's initial outlay.

ADVANTAGES OF PAYBACK METHOD:

- ❖ It is easy and quick.
- ❖ For a firm experiencing shortage of cash, it can be used to select investments involving minimum time.
- ❖ Helps it to determine the degree of risk involved in each investment proposal.
- ❖ Ideal for investment in a foreign country with volatile political stability and also Ideal where high external financing cost of the project.
- ❖ Preferred in industries where technological obsolescence comes within short period; say electronic industries.
- ❖ Good indicator of liquidity. If an entrepreneur is interested to have greater liquidity.

DISADVANTAGES OF PAYBACK METHOD:

- ❖ Ignores the time value of money and treats all cash flows at par.
- ❖ Does not consider cash flows that may be earned beyond the payout period.
- ❖ Ignores salvage or residual value, if any
- ❖ Ignores the cost of capital as the cut-off factor

2. The Average Accounting Rate of Return (ARR) Method / financial statement method

It considers the relative profitability of different capital investment proposals as the basis for ranking them - the fact neglected by the payout period technique. Rate of return

is calculated by dividing earnings by capital invested. Since both numerator and denominator carry different meanings. It is not surprising if one comes across a number of variations.

(b) Average Rate of Return on Average Investment:

$$= \left(\frac{\text{Net earnings after Depreciation and Taxes}}{\text{No. of years project will last}} \right) \div \text{Average Investment}$$

(a) Average Rate of Return in Original Investment:

$$= \left(\frac{\text{Net earnings after Depreciation and Taxes}}{\text{No. of years project will last}} \right) \div \text{Original Investment}$$

Average investment = total of original investment and investment in the project at the end divided by 2. It gives best result when original investment is evenly recovered over the economic life of the project which may not always be the case.

Decision Rule for Average of Rate of Return Method:

Normally, business firm determine rate of return. So accept the proposal if

$$\text{ARR} > \text{Minimum rate of return (cut off rate)}$$

and Reject the project if

$$\text{ARR} < \text{Minimum rate of return (cut off rate)}$$

ADVANTAGES:

- (i) Earnings over the entire life of the project are considered.
- (ii) This method is easy to understand, simple to follow. Accounting concept of income after taxes is known to all

DISADVANTAGES:

- (i) Ignore the time value of money.
- (ii) The assumption of regular recovery of capital over time as implied in average investment approach is not well founded.
- (iii) Cannot be applied to a situation where part of the investment is to be made after the beginning of the project
- (iv) Different methods, so results are not the same. So its difficult to compare with cut of rate
- (v) Its major limitation is that ARR is based on accounting principle and not on cash flow analysis.

Suitability of using ARR Method:

- If the project life is not long, then the method can be used to have a rough assessment of the internal rate of return.

Discounted Cash Flow (DCF) Method

- The traditional techniques like the Payback period or Accounting rate of return takes no account of the time value of the money. But money received today is much more valuable than the same money received later. Present inflationary conditions magnify the difference. This is the principal fact that modern analysis technique like Discounted Cash flow have incorporated.

Discounted cash flow method involves following steps: (No need to read during exam)

1. Computation of cash flows i.e. both inflows and out flows (preferably after tax) over the life of the project.

2. Applying the discount factor to the cash flows.

3. Totalling discounted cash- inflows and comparing it with discounted cash outflows.

Broadly, there are three discounted cash flow methods for evaluating capital investment proposals i.e.

A. Net Present Value Method

B. Internal Rate of Return Method

C. Profitability Index or Benefit Cost (B/C) Ratio Method.

Net Present Value Method (NPV)

The net present value method is understood to be the best available method for evaluating the capital investment proposals.

Steps : (No need to read during exam)

Under this method, the cash outflows and inflows associated with each project are ascertained first.

Cash inflows are worked out by adding depreciation to profit after tax arising to each project. Since the cash outflows and inflows arise at different point of time and cannot be compared, so both are reduced to the present values at the rate of return acceptable to the management.

The rate of return is either cost of capital of the firm or the opportunity cost of capital to be invested in the project. The assumption under this method remain that cash inflows are reinvested at the same discount rate.

Decision Rule of using NPV Method:

- If NPV > Zero : Accept the project
NPV < Zero : Reject the project
NPV = Zero : Firm is indifferent to accept or reject the project.

In essence, Net Present Value is the difference between the sum total of present values of all the future cash inflows and outflows

ADVANTAGES:

- (i) Income over the entire life of the project is considered.
- (ii) Considers time value of money.
- (iii) Considers the firm objective of wealth maximisation

DISADVANTAGES:

- (i) It requires special skill for calculation. Difficult to understand and apply and determine the cost of capital.
- (ii) An additional difficulty in this approach is encountered when projects have unequal lives And when projects involves different amount of investment.

Suitability of NPV Method :

Net present value is the most suitable method in those circumstances where availability of resources is not a constraint. The management authority can accept all those projects having Net

Present Value either Zero or positive.

Internal Rate of Return (IRR)

- The internal rate of return refers to the rate which equates,
- The present value of cash inflows and present value of cash outflows.
- ie, it is the rate at which net present value of the investment is zero.
- If the Net Present Value is positive, a higher discount rate may be used to bring it down to equalise the discount cash inflows and vice versa.
- That is why Internal Rate of Return is defined as the breakeven financing rate for the project.

The necessary steps to be followed in applying this method are: (no need to read once you can solve practical questions)

(i) Project the net cash benefit of an investment during the whole of its economic life. Future cash flows should be estimated after taxes, but before depreciation and interest.

(ii) Determine the rate of discount that equates the present value of its future cash benefits to its present investment. The rate of discount is determined by the method of trial and error.

(iii) Compare the rate of discount as determined above with the cost of capital or any other cut-off rate, and select proposals with the highest rate of return as long as the rate is higher than the cost of capital or cut off rate.

Decision Rule:

If Internal Rate of Return i.e.

$r > k$ (cut off rate) Accept the investment proposal

$r < k$ Reject the investment proposal

$r = k$ Indifferent

ADVANTAGES:

- Considers Time value of money.
- It considers profitability of the whole project its economic life.
- Provides for uniform ranking & quick comparison of efficiency of different projects.
- Sophisticated and more reliable technique.
- The objective of maximising of owner's wealth is met.

DISADVANTAGES:

- Most difficult of all the methods
- An important assumption implied in this method is that incomes are reinvested (compounding) over the project's economic life at the rate earned by the investment. This assumption is correct and justified only when the internal rate of return is very close to the average rate of return earned by the company on its total investments. To the extent internal rate of return departs from the typical rate of earnings of the company, results of this method, will be misleading. Thus, when the internal rate of return on a project is computed to be 30% while company's average rate of return is 15%, the assumption of earning income on income at the rate of 30% is highly unrealistic. From this point of view the assumption of the net present value method that incomes are reinvested at the rate of discount (cost of capital) seems to be more reasonable. (Comparison of NPV v/s IRR)
- The rate may be negative or more than one IRR if a project has a sequence of changes in sign of cash flow.

Point of Similarities

IRR will give the same results as NPV in terms of acceptance or rejection of investment proposals in the following circumstances:

1. Projects having conventional cash flows i.e. a situation where initial investment (outlay or cash outflow) is followed by series of cash inflows.
2. Independent Investment Proposals: Such proposal, the acceptance of which does not exclude the acceptance of others.

When, $NPV > 0$ then $IRR > r$ required rate of return i.e. K_0 and when $npv = 0$ then $R = r$

The NPV Method is considered to be superior than IRR. However, IRR method is preferable in the evaluation of risky projects.

Profitability Index (PI) Method

Profitability Index is defined as the ratio of present value of the future cash benefits at the required rate of return to the initial cash outflow of the investment.

Decision Rule:

IF $PI > 1$ Accept the Project, $PI = 1$ indifferent, $PI < 1$ Reject the project.

In the event of more than one alternatives, projects may be ranked according to their ratio - the project with the highest ratio should be ranked first and vice versa.

Profitability index = $\frac{PV \text{ of Future cash flows}}{\text{Initial cash investment}}$

$$PI = \frac{\sum_{t=1}^n \frac{A_t}{(1+k)^t}}{C}$$

A_t = Present value of cash inflows.

k = rate of return

C = initial cash outlay

t = time period.

ADVANTAGES:

- (1) Considers time value of money.
- (2) Satisfies almost all the requirements of a sound investment criterion.
- (3) Useful to rank projects of varying cash and benefits
- (4) Ensures shareholders wealth maximisation.

DISADVANTAGES:

- (1) Difficult to understand and compute.
- (2) Does not take into account the amount of investment.
- (3) When cash outflows occur beyond the cement period Profitability Index Ratio criterion is unsuitable as a selection criterion.

CAPITAL RATIONING

A firm with capital rationing constraint attempts to select the combination of investment projects that will be within the specified limits of investments to be made during a given period of time and at the same time provide greatest profitability.

CR is usually introduced when,

- when financing investment proposals is only by ploughing back its retained earnings. In that case, capital expenditure cannot exceed the amount of retained earnings.
- when a department is authorised to make investments upto a limit beyond which investment decisions will be made by higher level management.
-

Sometimes CR does not lead optimum results because :

- CR may result in accepting several small investments than accepting a few large to fully utilise the budget ceiling, and hence might result in less profitability ratio (Amount of profit is maximum but Profit ratio might be less)
- Similarly, CR also means that the firm foregoes the next most profitable investment falling after the budget ceiling.

Risk Evaluation and Sensitivity analysis

Risk analysis gives management better information about the possible outcomes that may occur so that management can use their judgement and experience to accept or reject an investment. Since risk analysis is costly, it should be used relatively in costly and important projects.

Future is uncertain and involve risk.

Seasonal fluctuations and business cycles

Change in cost of capital because of inflation/deflation.

Technological developments ,making plants or equipments obsolete

Standard Deviation and Coefficient of Variation

Standard Deviation is considered as the best measures of dispersion or variability. Lower standard deviation will indicate lower variability in cash flow estimates; hence such investment proposal may be preferred against the proposal having higher standard deviation.

Risk Adjusted Discount Rate (RADR) Method

Risk adjusted discount rates method is used in investment and budgeting decisions to cover time value of money and the risk. The use of risk adjusted discount rate is based on the concept that investors demands higher returns from the risky projects.

The required return of return on any investment should include compensation for delaying consumption equal to risk free rate of return, plus compensation for any kind of risk taken on.

The case, risk associated with any investment project is higher than risk involved in a similar kind of project, discount rate is adjusted upward in order to compensate this additional risk borne. .

Certainty Equivalent Approach (CE Approach)

The certainty equivalent approach may be expressed as:

The certainty equivalent coefficient assumes value between 0 and 1, and varies inversely with risk. A lower will be used if greater risk is perceived and a higher will be used if lower risk is anticipated. The decision maker subjectively or objectively establishes the coefficients. These coefficients reflect the decision maker's confidence in obtaining a particular cash flow in period t. Thus, to obtain certain cash flows, we multiply estimated cash flows by the certainty-equivalent coefficients.

The certainty-equivalent coefficient can be determined as a relationship between the certain cash flows and the risky cash flows, i.e.

$$\alpha_t = \frac{NCF_t}{NCF_r} = \frac{\text{Certain net cash flow}}{\text{Risky net cash flow}}$$

$$NPV = \sum_{t=0}^n \frac{\alpha_t NCF_t}{(1+k_f)^t}$$

where NCF_t = the forecasts of net cash flow without risk adjustment

α_t = the risk adjustment factor or the certainty equivalent coefficient

k_f = risk- free rate of return assumed to be constant for all periods

Decision Tree Analysis

Decision tree technique is another method which many corporate units use to evaluate risky proposals. A decision tree shows the sequential outcome of a risky decision. A capital budgeting decision tree shows the cash flows and net present value of the project under differing possible circumstances.

Sensitivity Analysis in Capital Budgeting

Sensitivity analysis is used in Capital budgeting for more precisely measuring the risk. It helps in assessing information as to how sensitive are the estimated parameters of the project such as cash flows, discount rate, and the project life to the estimation errors. Sensitivity analysis takes care of estimation errors by using a number of possible outcomes by evaluating a project by using a number of possible cash flows and calculating its impact on NPV or IRR to variation in underlying factors like selling price, quantity sold, returns from an investment etc. Sensitivity analysis answers questions like,

(i) What happens to the present value (or some other criterion of merit) if flows are, say Rs. 50,000 than the expected Rs. 80,000?

(ii) What will happen to NPV if the economic life of the project is only 3 years rather than expected 5 years?

In terms of capital budgeting the possible cash flows are based on three assumptions:

(a) Cash flows may be worst (pessimistic)

(b) Cash flows may be most likely.

(c) Cash flows may be most optimistic.

Ordinarily, the assumptions are varied one at a time i.e. cash flows may be held constant with rate of discount used to vary; or discount rate is assumed constant and cash flow may vary with assumed outlay; or the level of initial outlay may change with discount rate and annual proceeds remaining the same.

SIMULATION FOR RISK EVALUATION

Simulation is known as simulated sampling or more fully Monte-Carlo simulation is as much an art as a technique. In simulation a mathematical model is constructed and artificial data (variables) is fed in computer.

The desired parameters of the system are then determined. Simulation like sensitivity analysis is not an optimising technique. It merely provides a convenient representation of reality. Its expensive device and suits only heavy capital expenditure.

Capital budgeting Techniques under uncertainty : Risk can be defined as the chance that the actual outcome will differ from the expected outcome. Uncertainty relates to the situation where a range of differing outcome is possible, but it is not possible to assign probabilities. The two terms are generally used interchangeably in finance. The most common measures of risk are standard deviation and coefficient of variations. There are three different types of project risk to be considered:

1. Stand-alone risk:

This is the risk of the project itself as measured in isolation from any effect it may

2. Corporate or within-firm risk:

This is the total or overall risk of the firm when it is viewed as a collection or portfolio of investment projects.

3. Market or systematic risk:

This defines the view taken from a well-diversified shareholders and investors. Market risk is essentially the stock market's assessment of a firm's risk, its beta, and this will affect its share price.

Statistical Techniques for Risk Analysis :

(a) Probability Assignment:

• The concept of probability is fundamental to the use of the risk analysis techniques. It may be defined as the likelihood of occurrence of an event. If an event is certain to happen its probability is 1 and if its certain not to occur, its probability zero. Probability lies between zero and one.

(b) Expected Net Present Value:

• Once the probability assignments have been made to the future cash flows, the next step is to find out the expected net present value. It can be found out by multiplying the monetary values of the possible events by their probabilities. The following equation describes the expected net present value.:

(c) Standard Deviation:

• Standard deviation(s) is an absolute measure of risk analysis and it can be used when projects under consideration are having same cash outlay.

(d) Coefficient of Variation:

If the projects to be compared involve different outlays/different expected value, the coefficient of variation is the correct choice, being a relative measure.

(b) Expected Net Present Value:

$$ENPV = \sum_{i=0}^n \frac{ENCF_t}{(1+k)^t}$$

d) Coefficient of Variation:

$$CV = \frac{\text{Standard deviation or } \sigma}{\text{Expected Value CF}}$$

(c) Standard Deviation:

$$\sigma = \sqrt{\sum_{i=1}^n (CF_i \times \overline{CF})^2 \times P_i}$$

(e) Probability Distribution Approach:

The application of this theory in analyzing risk in capital budgeting depends upon the behaviour of the cash flows, being (i) independent (signifies that future cash flows are not affected by the cash flows in the preceding or following years), or (ii) dependent. (the cash flows in one period depend upon the cash flows in previous periods)

(f) Normal Probability Distribution:

The normal probability distribution can be used to further analyze the risk in investment decision.

Chapter 2 Investment Decisions : Capital Budgeting

1is a project whose cash flows are not affected by the accept/reject decision for other projects.			
A) Independent project	B) Mutually exclusive project	C) Risk free project	D) Low cost project	

2	. Incorporating flotation costs into the analysis of a project will:			
A) increase the NPV of the project.	B) have no effect on the present value of the project.	C) increase the initial cash outflow of the project.	D) increase the project's rate of return.	

3	With limited finance and a number of project proposals at hand, select that package of projects which has			
A) Profitability index is greater than unity	B) The maximum net present value	C) Internal rate of return is greater than cost of capital	D) Any of the above	

4	The values of the future net incomes discounted by the cost of capital are called -			
A) Net present values	B) Average capital cost	C) Discounted capital cost	D) Net capital cost	

5	Capital budgeting decisions are analyzed with help of weighted average and for this purpose -			
A) Common stock value is used	B) Component cost is used	C) Asset valuation is used	D) Cost of capital is used	

6	A Profitability Index (PI) of 0.92 for a project means that			
A) the project's NPV is greater than zero.	B) the project's costs (cash outlay) are (is) less than the present value of the project's benefits.	C) the project returns 92 cents in present value for each rupee invested.	D) the project's NPV is greater than 1.	

7	Capital budgeting is the process -			
A) by which the firm decides which long-term investments to make.	B) which help to make master budget of the organization.	C) By which the firm decides how much capital to invest in business	D) undertaken to analyze how make available various finance to the business	

8	Which of the following is demerit of payback period?			
A) This method	B) It is difficult to	C) It fails to take into	D) None of the above	

disregards the initial investment involved.	calculate as well as understand it as compared to accounting rate of return method.	account the timing of returns and the cost of capital.	
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9	When choosing among mutually exclusive projects, the project with -		
A) Quickest payback is preferred	B) Longest payback is preferred	C) Higher NPV get selected	D) Lower cost of capital will be selected

10	Lotus Corporation is trying to determine how to assign discount rates to the various projects proposed by its numerous international divisions. The company should put the greatest emphasis on which one of the following when assigning the discount rates?		
A) the currency exchange rate that will apply to the project	B) the geographic location where the project will be undertaken	C) the experience of the managers of the division which is proposing the project	D) the various types of risk associated with the project

11	Accept a project if the profitability index is:		
A) positive	B) less than 1	C) negative	D) greater than 1

12	Which of the following statistical or mathematical technique of risk evaluation is used in capital budgeting? (I) Certainty Equivalent Approach (II) Standard Deviation (III) Sensitivity Analysis (IV) Probability Distribution Approach Select the correct answer from the options given below -		
A) I and II only	B) I only	C) I, II, IB and IV	D) I, II and III only

13is the ratio of assured cash flows to uncertain cash flows.		
A) Contingency Equivalent Factor (CEF)	B) Beta Factor (BF)	C) Certainty Equivalent Factor (CEF)	D) Risk Premium Factor (RPF)

14	Profitability index is actually a modification of the -		
A) Net present value method	B) Payback period method	C) IRR Method	D) Risk premium method

15	The decision to accept or reject a capital budgeting project depends on		
A) cost of capital that are invested in	B) an analysis of the cash flows	C) Both (A) and (B)	D) Neither (A) nor (B)

business/project.	generated by the project		
16 What is the difference between economic profit and accounting profit?			
A) Economic profit covers the profit over the life of the firm, while accounting profit only covers the most recent accounting period.	B) Economic profit includes a charge for all providers of capital while accounting profit includes only a charge for debt.	C) Accounting profit is based on current accepted accounting rules while economic profit is based on cash flows.	D) All of the above are correct.
17 Which of the following is demerit of payback period?			
A) This method makes no attempt to measure a percentage return on the capital invested and is often used in conjunction with other methods.	B) It does not indicate whether an investment should be accepted or rejected, unless the payback period is compared with an arbitrary managerial target.	C) The method ignores cash generation beyond the payback period and this can be seen more a measure of liquidity than of profitability.	D) All of the above
18 Which of the following represents the amount of time that it takes for a capital budgeting project to recover its initial cost?			
A) Payback period	B) Maturity period	C) Investment period	D) Redemption period
19 A project is accepted when:			
A) Internal Rate of Return will be greater than cost of capital	B) Net present value is greater than zero	C) Profitability index will be greater than unity	D) Any of the above
20 Statement I: In case of capital rationing, a company is compelled to invest in projects having shortest payback period. Statement II: The shorter the payback period, the less risky is the project. Therefore, it can be considered as an indicator of risk. Select the correct answer from the options given below:			
A) Both Statement I and Statement II are false.	B) Statement I is true but Statement II is false.	C) Statement II is true but Statement I is false.	D) Both Statement I and Statement II are true.

21	Incorporating flotation costs into the analysis of a project will:		
A) increase the NPV of the project.	B) have no effect on the present value of the project.	C) increase the initial cash outflow of the project.	D) increase the project's rate of return.
22	A project whose acceptance does not prevent or require the acceptance of one or more alternative projects is referred to as		
A) Independent project	B) Mutually exclusive project	C) Contingent project	D) Dependent project
23	The Internal Rate of Return (IRR) criterion for project acceptance, under theoretically infinite funds is: Accept all projects which have -		
A) IRR greater than the cost of capital	B) IRR equal to the cost of capital	C) IRR less than the cost of capital	D) None of the above
24	Which of the following is demerit of accounting rate of return (ARR) method?		
A) It fails to measure properly the rates of return on a project even if the cash flows are even over the project life.	B) It does not take into accounting time value of money.	C) It is biased against short-term projects in the same way that payback is biased against longer-term ones.	D) All of the above
25	Consider following two statements. I. The NPV decision rule specifies that all independent projects with a positive NPV should be accepted. n. When choosing among mutually exclusive projects, the project with the largest (positive) NPV should be selected. Select the true statement.		
A) Neither I nor II	B) I only	C) Both I and II	D) II only
26	The shorter the payback period -		
A) the less risky is the project.	B) the more risky is the project.	C) more will the NPV of the project	D)) less will the NPV of the project.
27	Where capital availability is unlimited and the projects are not mutually exclusive, for the same cost of capital, following criterion is used?		

A) Internal Rate of Return	B) Net present value	C) Profitability Index	D) Any of the above
28 NPV = Rs.			
A) Project's cash inflows after tax minus the project's cash outflows.	B) Project's cash inflows minus the project's cash outflows.	C) Present value of the project's cash inflows minus the present value of the project's cash outflows.	D) Present value of the project's cash inflows minus the present value of the project's cash outflows.
29 A project is accepted when:			
A) Internal Rate of Return will be greater than cost of capital	B) Net present value is greater than zero	C) Profitability index will be greater than unity	D) Any of the above
30 Which of the following represents the amount of time that it takes for a capital budgeting project to recover its initial cost?			
A) Payback period	B) Maturity period	C) Investment period	D) Redemption period
31 is an investment appraisal technique calculated by dividing the present value of future cash flows of a project by the initial investment required for the project.			
A) Indexed cost method	B) Cost benefit ratio	C) Profitability index	D) Both (B) and (C)
32 . Which of the following statement is true in relation to NPV Method? 1. It considers the total benefits arising out of proposals over its lifetime. 2. It recognizes the time value of money. 3. It produces multiple rates, which can be confusing. 4. NPV can never be zero if cash flows are discounted by using risk free rate. Select the correct answer from the options given below.			
A) 1, 2 & 3	B) 1 & 3	C) 1 & 2	D) 2, 3 & 4
33 Lower standard deviation indicates -			
A) higher risk	B) lower risk	C) highly favorable situation	D) no risk at all
34 is a technique used to determine how different values of an independent variable impact a particular dependent variable under a given set of assumptions.			
A) Single Variable Analysis	B) Simulation Analysis	C) Sensex Analysis	D) Sensitivity Analysis

35	Which of the following statements is incorrect regarding a normal project?			
A) If the PI of a project equals 0, then the project's initial cash outflow equals the PV of its cash flows.	B) If the NPV of a project is greater than 0, then its PI will exceed 1.	C) If the IRR of a project is 8%, its NPV, using a discount rate, K_0 , greater than 8%, will be less than 0.	D)) If the IRR of a project is greater than the discount rate, then its PI will be greater than 1.	

36is the discount rate which should be used in capital budgeting.			
A) Risk free rate (R_f)	B) Cost of capital (K_0)	C) Beta rate (P)	D) Risk premium (R_m)	

37	Which of the following method of capital budgeting ignores the time value of money?			
A) Net present value	B) Discounted payback period	C) Internal rate of return	D) None of the above	

38	. As per discounted payback period method, a project with -			
A) higher NPV will be preferred.	B) less discounted payback period will be selected.	C) more discounted payback period will be selected.	D) low NPV will be preferred.	

39of a capital budgeting project is the discount rate at which the Net Present Value (NPV) of a project equals zero.			
A) Risk Free Rate of Return (RFRR)	B) External Rate of Return (ERR)	C) Internal Rate of Return (IRR)	D) Price Cost Method (PCM)	

40	When operating under a single-period capital rationing constraint, you may first want to try selecting projects by descending order of their in order to give yourself the best chance to select the mix of projects that adds most to firm value.			
A) Payback Period (PBP)	B) Profitability Index (PI)	C) Net Present Value (NPV)	D) Internal Rate of Return (IRR)	

41	When choosing among mutually exclusive projects, the project with -			
A) Higher NPV get selected	B) Lower cost of capital will be selected	C) Longest payback is preferred	D) Quickest payback is preferred	

42	Which of the following capital budgeting techniques takes into account the incremental accounting income rather than cash flows?			
A) Internal rate of return	B) Net present value	C) Cash payback	D) Accounting/simple	

		period	rate of return
43	A single, overall cost of capital is often used to evaluate projects because:		
A) it is the only way to measure a firm's required return.	B) it avoids the problem of computing the required rate of return for each investment proposal.	C) it acknowledges that most new investment projects offer about the same expected return.	D) it acknowledges that most new investment projects have about the same degree of risk.
44	. Ranking projects according to their ability to repay quickly may be useful to firms:		
A) when careful control over cash is required.	B) when experiencing liquidity constraints.	C) when careful control over cash is required.	D) All of the above
45	. Some projects that a firm accepts will undoubtedly result in zero or negative returns. In light of this fact, it is best if the firm:		
A) Adjusts its hurdle rate (Le. cost of capital) downward to compensate for this fact	B) Adjusts its hurdle rate (Le. cost of capital) upward to compensate for this fact.	C) Raises its prices to compensate for this fact.	D) Does not adjust its hurdle rate up or down regardless of this fact
46	A project whose acceptance precludes the acceptance of one or more alternative projects is referred to as		
A) Dependent project	B) Mutually exclusive project	C) Independent project	D) Contingent project
47	What is the idea behind project-specific required rates of return for a firm or division?		
A) All of the above	B) Different projects should have different required rates of return because they are not alike with respect to risk.	C) Each firm should have a different required rate of return because firms are not alike with respect to risk and have been created historically by projects taken that differ with regards to risk.	D) A division of the firm will always have a required rate of return different from the firm's overall weighted average cost of capital because the risk of the division always differs from that of the firm.

48	Which of the following is not a potential for a ranking problem between two mutually exclusive projects?						
A)	One of the mutually exclusive projects involves replacement while the other involves expansion.	B)	The projects have unequal lives that differ by several years.	C)	The costs of the two projects differ by nearly 30%.	D)	The two projects have cash flow patterns that differ dramatically.

49	How ARR is calculated?						
A)	(Average NPV/Investment) Rs.100	B)	Average PAT/Initial Investment) Rs.100	C)	Initial Investment/Average PAT) Rs.100	D)	Average PAT/Initial Investment) = 100

50	The adjusted present value (APV) is best described as being						
A)	equal to the discounted value of operating cash flows plus the present value of any tax-shield benefits less any flotation costs	B)	equal to the discounted value of all cash flows after the discount rate is adjusted upward for additional risk	C)	benefits equal to the discounted value of operating cash flows less any flotation costs.	D)	equal to the discounted value of operating cash flows plus the present value of any tax-shield

51	Which of the following statements is correct regarding the internal rate of return (IRR) method?						
A)	As long as you are not dealing with mutually exclusive projects, capital rationing, or unusual projects having multiple sign changes in the cashflow stream, the internal rate of return method can be used with reasonable confidence.	B)	Each project has a unique internal rate of return.	C)	The internal rate of return is rarely used by firms today because of the ease at which net present value is calculated.	D)	The internal rate of return does not consider the time value of money.

52	The IRR decision rule specifies that all independent projects -						
A)	having IRR greater economic value added should be selected.	B)	with positive NPV should be selected.	C)	with an IRR greater than the cost of capital should be accepted.	D)	with an IRR greater than the cost of capital should be accepted though it have negative NPV.

53	An increase in the discount rate will:						
A)	Have no effect on net present value.	B)	Reduce the present value of future cash flows.	C)	Increase the present value of future cash flows.	D)	Compensate for reduced risk.

54	If you are considering two projects namely, Project X & Project Y; NPV of the Project X is higher than Project Y but IRR of Project Y is greater than Project X then you will select -						
A)	Project X	B)	Project Y	C)	Some other project	D)	None of the above

55	. If we add depreciation and other non-cash expenses in profit after tax, the resulting figure is						
A)	CFAT	B)	Profit available for equity shareholder	C)	Free cash flow	D)	Net cash flow

56	Which of the following is correct formula to calculate payback period reciprocal?						
A)	100/payback period) Rs.10	B)	1/payback period) Rs.100	C)	$\frac{1}{(1/\text{payback period}) \times \beta} = 100$	D)	$\frac{100}{\text{payback period}) \times \beta}$

57	Using profitability index, the preference rule for ranking projects is:						
A)	the higher the profitability index, the more desirable the project.	B)	the lower the profitability index, the more desirable the project.	C)	the higher the sunk cost, the more desirable the project.	D)	the lower the sunk cost, the more desirable the project.

58	Which of the following statements is true about mutually exclusive projects?						
A)	They are never evaluated.	B)	They are not in direct competition with each other.	C)	They are in direct competition with each other.	D)	They are not evaluated based on shareholder wealth.

59	Which of the following techniques does not take into account the time value of money?						
A)	Simple cash payback method	B)	Internal rate of return method	C)	Discounted cash payback method	D)	Net present value method

60	The term mutually exclusive investments mean						
A)	Selection of one investment precludes the selection of an alternative	B)	Choose only the best investments	C)	There are no investment options available.	D)	The elite investment opportunities will get chosen.

61	The current worth of a sum of money to be received at a future date is called:						
A)	Present value	B)	Real value	C)	Future value	D)	Salvage value

62	A project whose cash flows are more than capital invested for rate of return then net present value will be		
A) Independent	B) Positive	C) Zero	D) Negative
63	Capital rationing refers to a situation -		
A) where cost of the projects is equal to present value leading NPV to zero.	B) where a company cannot undertake projects as the cost of capital is less than required rate of return on projects.	C) where a company cannot undertake all positive NPV projects, it has identified because of shortage of capital.	D) where company is confused in selection of more than one projects.
64	Generally, a project is considered acceptable if its net present value is:		
A) Negative or positive	B) Negative or zero	C) Negative	D) Positive or zero
65	The beta coefficient is associated with -		
A) Dividend valuation model	B) Capital asset pricing model	C) Tax-adjusted cost of debt	D) Risk-free rate plus premium model
66	Why are projects with negative net present values (NPVs) unacceptable to a firm?		
A) Returns lower than the cost of capital result in higher profit ratios	B) Returns lower than the cost of capital result in firm failure.	C) Returns with negative NPVs cause an equal profit ratio.	D) Returns with negative NPVs are acceptable to a firm.
67	Cash flows that should be considered for decision in hand are classified as -		
A) Irrelevant cash flows	B) Relevant cash flows	C) Transaction cash flows	D) Marginal cash flows
68	Risk of a capital budgeting can be incorporated:		
A) Adjusting the Discount Rate	B) Adjusting the Cash flows	C) Adjusting the life	D) All of the above
69	Which of the following is correct for Risk Adjusted Discount Rate (RADR)Rs.		
A) RADR is overall cost of capital plus risk-premium	B) Accept a project if NPV at RADR is negative	C) Accept a project if IRR is more than RADR	D) All of the above

70	The difference between the present value of cash inflows and the present value of cash outflows associated with a project is known as:			
A) Net future value of the project	B) Net present value of the project	C) Net salvage value of the project	D) Net historical value of the project	

71	Which of the following is an example of a capital investment project?			
A) Development of employee training programs	B) Replacement of worn out equipment	C)) Expansion of production facilities	D) All of the above are examples of capital investment projects.	

72	Internal Rate of Return is defined as -			
A) The discount rate which causes the NPV to equal zero.	B) The discount rate which causes the payback to equal one year.	C) The ROE associated with project maximization.	D) The ROE when the NPV equals 0.	

73	In capital budgeting, positive net present value results in -			
A) Positive economic value added	B) Negative economic value added	C) Percent economic value added .	D) Zero economic value added	

74	What are the two drawbacks associated with the payback period?			
A) The time value of money is considered. It ignores cash flows beyond the payback period.	B) The time value of money is ignored. It ignores cash flows beyond the payback period.	C)) The time value of money is ignored. It includes cash flows beyond the payback period.	D) The time value of money is considered. It includes cash flows beyond the payback period.	

75	If present value of cash outflow is equal to present value of cash inflow, the net present value will be:			
A) Negative	B) Positive	C) Infinite	D) Zero	

76	Nominal interest rates and nominal cash flows are usually reflected the -			
A) Equity effects	B) Inflation effects	C)) Opportunity effects	D)) Debt effects	

77	Which of the following cash flows should not be considered relevant in calculating project cash flows?			
A) Opportunity costs	B) Investments in net working capital as a result of making the investment	C) Any effects caused by cannibalization	D) Sunk costs	

78	Which of the following is not applied in capital budgeting?		
A) All costs and benefits are measured on cash basis	B) Cash flows be calculated in incremental terms	C) All benefits are measured on after tax basis.	D) All accrued costs and revenues be incorporated
79	In mutually exclusive projects, project which is selected for comparison with others must have		
A) Zero net present value	B) Higher net present value	C) Lower net present value	D)) All of the above
80	In cash flow estimation and risk analysis, real rate will be equal to nominal rate if there is -		
A) High inflation	B) No inflation	C) No acceleration	D) No transactions
81	Capital budgeting is the process of identifying analyzing and selecting investments project whose returns are expected to extend beyond -		
A) 2 years	B) 3 years	C) Months	D) 1 year
82	In Certainty Equivalent Approach, the CE Factors for different years are:		
A) Generally decreasing	B) Generally increasing	C) Generally same	D) None of the above
83	Expected Value of Cash flow, EVCF, is:		
A) Most likely cash flows	B) Certain to occur	C) Geometric average cash flow	D) Arithmetic average cash flow
84	. Which method provides more confidence, the payback method or the net present value method?		
A) Payback because it provides a good timetable.	B) Payback because it tells you when you break even.	C) Net present value because it does not need to use cost of capital.	D) Net present value because it considers all inflows and outflows and the time value of money.
85	Decision-tree approach is used in:		
A) Sequential decisions	B) Proposals with longer life	C) Accept-Reject Proposal	D) Independent Cash flows
86	All benefits are measured on after tax basis.		
A) brings long-term benefits	B) is related to Fixed Assets	C) has very large investment	D) brings short-term benefits only

87	Relationship between Economic Value Added (EVA) and Net Present Value (NPV) is considered as			
A)	Economic relationship	B) Valued relationship	C) Inverse relationship	D) Direct relationship
88	Real interest rate and real cash flows do not include -			
A)	Opportunity effects	B) Equity effects	C) Debt effects	D) Inflation effects
89	Cash inflows are revenues of project and are represented by—			
A)	Relative number	B) Hurdle number	C) Positive numbers	D) Negative numbers
90	Concept of joint probability is used in case of:			
A)	Dependent cash flows	B) Independent cash flows	C) Certain cash flows	D) Uncertain cash flows
91	Indifference criteria when BCR (Benefit Cost Ratio)Rs.			
A)	BCR = 1	B) BCR > 1	C) BCR < 1	D) None of the above
92	To estimate an unknown number that lies between two known numbers is known as -			
A)	Capital budgeting	B) Capital rationing	C) Amortization	D) Interpolation
93	Situation in which company replaces existing assets with new assets is classified as			
A)	New projects	B) Replacement projects	C) Internal projects	D) Existing projects
94	Which of the following is not used in capital budgeting?			
A)	Time Value of Money	B) Tax Effect	C) Rate of Cash Discount	D) Required Rate of Return
95	If two projects are completely independent (or unrelated), the measure of correlation between them is:			
A)	0.5	B) 0	C) -1.0	D) 1.0
96	The investment proposal with the greatest relative risk would have:			
A)	Highest coefficient of variation of net present value.	B) Highest standard deviation of net present value.	C) Lowest opportunity loss.	D) Highest expected value of net present value.
97	Criterion for IRR (Internal Rate of Return)Rs.			
A)	Accept, if IRR < Cost of capital	B) Accept, if IRR > Cost of capital	C) Accept, if IRR = Cost of capital	D) None of the above

98	The process of planning expenditures that will influence the operation of a firm over a number of years is called -			
A) Capital budgeting	B) Investment	C) Dividend valuation	D) Net present valuation	
99	Consider following two statements. (I) Capital budgeting decisions are reversible in nature. (II) An expansion decision is not a capital budgeting decision. Select the correct answer from the options given below.			
Statement (I)		Statement (II)		
A) True	True	B) False	True	C) True False D) False
100	Probability-tree analysis is best used when cash flows are expected to be:			
A) Risk-free.	B) Independent over time.	C) Related to the cash flows in previous periods.	D) Known with certainty.	
101	Which of the following statements is correct regarding the risk-adjusted discount rate (RADR) approach?			
A) Adjusting the firm's overall cost of capital downward is required if the project or group are of lower than average risk.	B) Under the RADR approach, we should accept a project if its net present value (NPV) calculated using a risk-adjusted discount rate is positive.	C) Under the RADR approach, we should NOT accept a project if its net present value (NPV) calculated using a risk-adjusted discount rate is positive.	D) Under the RADR approach, we would still compare a project's internal rate of return (IRR) to the firm's overall weighted-average cost of capital in order to decide acceptance/rejection.	
102	Damodhar is evaluating two conventional, independent capital budgeting projects (X & Y) by making use of the risk-adjusted discount rate (RADR) method of analysis. Projects X & Y have internal rates of return of 16% & 12%, respectively. RADR appropriate to Project X is 18%, while Project Y's RADR is only 10%. The company's overall, weighted-average cost of capital is 14%. Damodhar should -			
A) Reject Project X and accept Project Y	B) Accept Project X and accept Project Y	C) Accept Project X and reject Project Y	D) Reject Project X and reject Project Y	
103	Which of the following is correct formula to calculate risk-adjusted discount rate?			
A) $SD(\beta) \div NPV$	B) $R_f + \beta (R_m - R_f)$	C) $K \times \beta (R_m - R_f)$	D) $R_m - R_f + (K - R_f)$	
104	The categories of cash flows includes -			
A) Cash flow from terminal	B) Net initial	C) Cash flow from	D) All of the above	

disposal after paying taxes	investment	operations after paying taxes	
105	The decrease in purchasing power of any monetary unit such as euro, dollars etc. is classified as -		
A) Inflation	B) Net investment parity	C) Buying parity	D) Purchasing parity
106	The method which calculates the time to recoup initial investment of project in form of expected cash flows is classified as -		
A) Payback method	B) Net value cash flow method	C) Lean cash flows method	D) Single cash flow method
107	You are considering two mutually exclusive investment proposals, project A and project B. B's expected value of net present value is \$1,000 less than that for A and A has less dispersion. On the basis of risk and return, you would say that:		
A) Project B dominates project A.	B) Project A is more risky and should offer greater expected value.	C) Each project is high on one variable, so the two are basically equal.	D) Project A dominates project B.
108	Vayu Ltd. uses the Net Present Value (NPV) method, the Internal Rate of Return (IRR) method and Discounted Payback Period (DPP) to appraise its new investment. An investment opportunity was recently appraised using each of these methods and was estimated to provide a positive NPV of Rs.1.5 million, an IRR of 15% and a DPP of 3 years. Later, it was discovered that the cost of capital of the company was lower than had been previously estimated. What would be the effect on the figures provided by each investment appraisal method of taking account of the lower cost of capital?		
	NPV	IRR	DPP
A) Increase Decrease	Noeffect Decrease	Increase Increase Decrease	C) No effect Decrease No effect
D) Decrease No effect Decrease			
109	When using the expected value criterion, it is assumed that the individual wants to		
A) Maximize return for maximum level of risk	B) Maximize return for a given level of risk	C) Maximize return irrespective of the level of risk	D) All of the above
110	The concept which explains that a money received in present time is more valuable than money received in future is classified as -		
A) Storage value of money	B) Lead value of money	C) Cash value of money	D) Time value of money

111	You are considering two projects namely Project X and Project Y. 3 Project X has low standard deviation but high coefficient of variation as compared to Project Y. Project Y has high standard deviation but low coefficient of variation as compared to Project X. Which project will you select?			
A) Project X only	B) Project Y only	C) Both Project X & Project Y	D) Neither Project nor & Project Y	

112	Two mutually exclusive projects are being considered. Neither project will be repeated again in the future after their current lives are complete. There exists a potential problem though - the expected life of the first project is one year and the expected life of the second project is three years. This has caused the NPV and IRR methods to suggest different project preferences. What technique can be used to help make a better decision in this scenario?			
A) Use the common-life technique to replicate the one-year project three times and recalculate the NPV and IRR for the one-year project.	B) Rely on the NPV method and make your choice as it will tell you which one is best.	C) In this situation, we need to rely on the profitability index (PI) method and choose the one with the highest PI.	D) Ignore the NPV technique and simply choose the highest IRR since managers are concerned about maximizing returns.	

113	The profitability index may be used in investment decisions where capital rationing exists. In this context when selecting investments for an optimal portfolio, the use of the profitability index is appropriate only where 1. Projects are divisible. 2. Capital rationing occurs within a single investment period. Which one of the following combinations (true/false relating to the above statements is correct?)						
	Statement 1		Statement 2				
A) True	False	B) True	True	C) False	False	D) False	True

114	The coefficient of variation of net present value measures the			
A) Relative risk of the project	B) Total risk of the project	C) Market risk of the project	D) Highest expected value of net present value	

115	The rate of return to cover risk of investment and decrease in purchasing power as a result of inflation is classified as -			
A)) Required rate of return	B) Nominal rate of return	C) Accrual accounting rate of return	D) Real rate of return	

1	a	11	a	21	c	31	d	41	d	51	a	61	a	71	d
2	c	12	c	22	a	32	c	42	d	52	c	62	b	72	a
3	b	13	c	23	a	33	b	43	b	53	b	63	c	73	a
4	a	14	a	24	d	34	d	44	d	54	a	64	d	74	b
5	d	15	c	25	c	35	a	45	d	55	a	65	b	75	d
6	c	16	b	26	a	36	b	46	b	56	b	66	b	76	b
7	a	17	d	27	d	37	d	47	b	57	a	67	b	77	d
8	c	18	a	28	c	38	b	48	a	58	c	68	d	78	d
9		19	d	29	d	39	c	49	b	59	a	69	a	79	b
10	d	20	d	30	a	40	b	50	a	60	a	70	b	80	b
81	d	91	a	101	b	111	b	121	b	131	d	141	b	151	d
82	a	92	d	102	a	112	b	122	d	132	a	142	c	152	d
83	a	93	b	103	b	113	c	123	c	133	a	143	d	153	c
84	d	94	c	104	d	114	a	124	b	134	a	144	b	154	a
85	a	95	b	105	a	115	b	125	b	135	c	145	a	155	b
86	d	96	a	106	a										
87	d														
88	d	97	b												
		98	a	107	d										
89	c	99	d	109	b										
90	a	100	c	110	d										