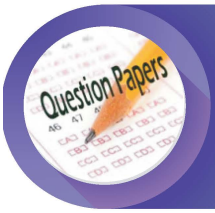
I Teach like this...

PREPARE

Acquire knowldge through demonstartion & Examples

PERFORM

Practice of Maximum no. of all variety of questions.



EVALUATION

Solving of past exam question papers in class itself

NO HOME WORK

All questions of module will be solved in class itself

DOUBT SOLVING

All the queries will be solved through social media & personal discussion

Features of "FM Rocks"

- It covers problem related to all the important concepts of all the chapters.
- Maximum coverage of concepts in few questions, along with the standard solution.
- Easy to understand.
- It will make FM short & Interesting.
- Very useful for Revision after class & one day before exam.
- It Includes Exam oriented tips.
- "Charts" for quick revision of formulas & important concepts.

"In short this book is just awesome from student's perspective. You will fall in love with FM."

Highlights of Main Book

- Colored book to make subject interesting
- Use of blue color to highlight important points
- Coverage of entire theory & all the concepts of ICAI module.
- It covers huge variety of problem to make you prepare from the exam point of view.
- Presentable format.
- Comprehensive notes which covers -
  - Module
  - Past exam paper questions
  - RTP
  - CA Final exam question of Capital Budgeting, Lease Financing, Dividend Decisions.

INDEX

Ch 1 - Capital Budgeting (Chart 1.1)

Capital Budgeting Techniques

A. Pay-back Period

It is the time period required to recover back the Principal amount invested for a project

Types of cash in flow

Even Cash Flows

$$\text{Pay-back Period} = \frac{\text{Initial Investment}}{\text{Annual Cash Flows}}$$

Uneven Cash Flows

we use cumulative CF to check the exact pay-back period.

How To Select : **Lesser** the pay-back period better the Project

B. Discounted pay-back period

It is time period to recover back the Principal amount invested considering the time value of money for a project.

* We first Discount the CFs of future years to PV
* Then Discounted CFs are cummulated to check the exact discounted pay- back period
* It is same like pay-back period, exact that here future years cash flows are discounted and then cummulated
* How To Select: **Lesser** the discounted pay-back period better the project.

C. Pay-back reciprocal

it is just opposite of pay- back Period

*As the name suggests, it is exactly opposite of pay back method.

$$\text{Pay back reciprocal} = \frac{1}{\text{Pay back period}}$$

*It indicates the annual rate of return on Initial Investment, without Considering time Value of Money

*How to Select : **Higher** the pay back reciprocal, better the project.

D. Average rate of return on (ARR)

it is the rate of return the project is giving without considering the time value of Money. This method considers profits and not cash flows for calculating rate of return

Average rate of return on (ARR)

Based on original Investment

$$\text{ARR} = \frac{\text{Average Annual Profit After Tax}}{\text{Original Investment}} \times 100$$

Based on Average Investment

$$\text{ARR} = \frac{\text{Average Annual Profit After Tax}}{\text{Average Investment}} \times 100$$

Where, Average Annual Profit=

$$\frac{\text{Total Profit}}{\text{No.of Years}}$$

and

$$\frac{\text{Opening WDV + Closing WDV}}{2}$$

OR

Average Investment =

$$\frac{\text{Original Investment-Scrap Value}}{2} + \text{Additional Working Capital} + \text{Scrap Value}$$

*How To Select: **Higher** the ARR, better the Project.*

E. Discounted Cash-flow Methods

It has 3 methods.

(a) Net present Value (NPV) Method.

(b) Profitability Index (PI) Method

(c) Internal rate of Return (IRR) method.

Next Page

Ch 1 - Capital Budgeting (Chart 1.2)

Discounted Cash flow Methods

Net Present Value (NPV) Method

*As the Name Suggests it is the net present value of all cash inflows and cash out flows

Net Present Value (NPV) = Present value of Cash Inflows − Present value of cash outflows

*It indicates by investing the project cost today how much extra we are getting in today's value.

*The cash flows are discounted using cost of capital.

*If NPV is +ve, we accept the project.

*Between 2 Projects the projects with higher NPV will be selected.

*Where the life of 2 projects under consideration is not same EAV is used as:

$$\text{Equated Annual Value (EAV)} = \frac{\text{NPV}}{\text{PVAF for life of Project}}$$

Profitability Index (PI) Method

$$PI = \frac{\text{PV of Cash in Flows}}{\text{PV of Cash Out Flows}}$$

OR

$$PI = \frac{\text{NPV + Initial Investment}}{\text{Initial Investment}}$$

*It indicates that for every 1 rupee invested in the project of how much we are getting in today's Value.

*How To Select: Higher the PI better the project

Internal Rate of Return (IRR) method

$$IRR = \text{start rate} + \frac{\text{Surplus}}{\text{Surplus + Deficit}} \times \text{Difference in rate}$$

*It is the rate of return given by the Project.

*If IRR is taken as discounting Rate, NPV is always Zero & PI is 1.

*How To Select :

1. If there is single project under consideration, IRR should be compared with cut off rate. We accept the Project if, IRR > cut off rate is Minimum required rate of return.
2. Between 2 Projects, Projects with higher IRR should be selected.

Important Points to Remember:

(1) Depreciation is Non-cash expense.
(2)Still we consider depreciation for Calculating tax amount.
(3)If there is no tax rate given,we ignore depreciation.
(4)If tax amount is given, we ignore depreciation

Effective interest Rate (EIR) :

it is same like internal rate of return (IRR)

It is the rate used for discount the future cash flows where present value of inflows will be equal to present value of outflows means at IRR Net present Value of Project will be always 'Zero'

Designed By- Swapnil Patni
- CA, CS, LLB, B.Com, CISA, DISA
- Expertise Knowledge in ISCA, EIS, SM, LAW.
- Presence all over India at the age of 30.
- Also Known as the " Motivational Guru".

Youtube Subscriber- 1,75,000
Follow us on
Facebook- CA Swapnil Patni
Instagram- swapnil_patni
YouTube swapnilpatni

Prepared By- Pallavi Shrotri

Following are the 8 Important questions out of total 45 questions from

CH 1 – Capital Budgeting

Which cover all the Important Adjustments

Q 1. SPC – Module 1 - Q 8

Reverse Working with IRR, PI and NPV

Given below are the data on a capital project 'A'

Annual cost of saving - ₹ 60,000

Useful life – 4 years

Profitability Index – 1.064

Internal rate of return – 15%

Salvage value – 0

Calculate - i) Cost of project ii) Payback period iii) Net present value (NPV) iv) Cost of capital.

Solution :-

i) Calculation of Annuity factor of P.V @ IRR 15% = 2.8549

IRR = P.V of D.C.F - Initial Investment =0

60,000 × 2.8549 – Initial Investment = 0

Initial Investment = 1,71,298

Cost of Project = 1,71,298

ii) Calculation of Profitability Index

$$\text{Profitability Index} = \frac{\text{P.V. of Inflows}}{\text{Initial Investment}}$$

$$1.064 = \frac{\text{P.V. Of Inflows}}{1,71,298}$$

P.V. of Inflows = 1,71,298 × 1.064

P.V. of Inflows = 1,82,261

iii) **Calculation Cost of Capital**

$$60{,}000 \times \sum \left[\frac{1}{1+r}\right]^{4} = 1{,}82{,}261$$

If r = 12.1 = 1,82,241

Cost of Capital = 12%

iv) **Calculation of NPV**

Year	Cash Flow	DF @ 12.1	D.C.F	Cum.CF
0	60,000	0.8928	53,571	53,571
2	60,000	0.7971	47,832	1,01,403
3	60,000	0.7117	42,706	1,44,109
4	60,000	0.6355	38,131	1,82,240

NPV = 1,82,240 - 1,71,298 = 10,942

v) **Calculation of Payback Period**

1,44,109 + 27189 | 1,71,298 - 10,942 | 1,82,240

In 12 Month Changes in Inflows = 1,82,240 - 1,44,109 = 38,131

So, for getting inflows of 27,189 Required Months = $\frac{12}{38{,}131} \times 27{,}189$

= 8.55 months ~9 months

So, payback Period = 3 years & 9 Months (Approximate)

Q 2. SPC – Module 1 - Q 14

Mutually Exclusive Projects – Differential project lives – Use of Equivalent NPV

Moon Ltd is considering the purchase of a machine which will perform operations which are at present performed by workers. Machines X and Y are the alternative models. The following details are available-

Particulars	Machine X	Machine Y
Cost of Machine	₹ 1,50,000	₹ 2,40,000
Estimated life of machine	5 years	6 years
Estimated cost of maintenance p.a.	₹ 7,000	₹ 11,000
Estimated cost of indirect material p.a.	₹ 6,000	₹ 8,000
Estimated savings in scrap p.a.	₹ 10,000	₹ 15,000
Estimated cost of supervision p.a.	₹ 12,000	₹ 16,000
Estimated savings in wages p.a.	₹ 90,000	₹ 1,20,000

Solution :-

Computation of NPV, ARR, P.I.

Particulars	Machine – X	Machine – Y
Saving in Direct Wages	90,000	1,20,000
Saving in Scrap	10,000	15,000
Estimated Cost of	(12,000)	(16,000)
Supervision	(7,000)	(11,000)
Cost of Maintenance	(6,000)	(8,000)
Cost of indirect	75,000	1,00,000
Material	(30,000)	40,000
CFBT	45,000	60,000

(-) Depreciation	(30,000)	(40,000)
PBT	45,000	60,000
(-) Tax @ 30%	13,500	18,000
PAT	**31,500**	42,000
(+) Depreciation	30,000	40,000
CFAT	**61,500**	82,000
PVAF @ 10.1	3.7907	4.3552
PV of DCF	**2,33,128**	3,57,126
Less: Initial Investment	1,50,000	2,40,000
NPV	**83,128**	**1,17,126**
ARR	$\frac{31,500}{1,50,000} \times 100$	$\frac{42,000}{2,40,000} \times 100$
	= 21 %	**= 17.5 %**
P.I	$\frac{2,33,128}{1,50,000}$	$\frac{3,57,126}{2,40,000}$
	= 1.5541	**= 1.4880**

- As per NPV. Method machine -y is better than Machine -x
- As per ARR method machine-x is better than machine- y
- As per P.I machine-x is better than machine-y

Q 3. SPC – Module 1 - Q 16

Computation of NPV, ARR, P.I.

Spark cooker company is evaluating three investment situation:

a) Produce a new line of Aluminum skillets.

b) Expand its existing cooker line to include several new sizes.

c) Develop a new, higher quality line of cooker.

Project	Investment required	PV of future cash flows
1	₹ 2,00,000	₹ 2,90,000
2	₹ 1,15,000	₹ 1,85,000
3	₹ 2,70,000	₹ 4,00,000

If Projects 1 and 2 are jointly undertaken, there will be no economies. the Investments required and Present Values will simply be the sum of the parts. With Projects 1 and 3, economies are possible in investment, because one of the Machines acquired can be used in both production processes.

The Total investment required for Projects 1 and 3 combined is ₹ 4.40.000. If Projects 2 and 3 is are undertaken, there are economies to be achieved in marketing and producing the products, but not in Investment.

The expected Present Value of Future Cash Flows for Projects 2 and 3 is ₹ 6.20.000. If all three Projects are undertaken simultaneously, the economies noted will still hold. However, a ₹ 1,25,000 extension on the Plant will be necessary, as space is not available for all three projects.

Which Project(s) should be chosen?

Solution :-

Calculation of NPV

Project	Investment Require	P.V. of Cf.	NPV
1	2,00,000	2,90,000	90,000
2	1,15,000	1,85,000	70,000
3	2,70,000	4,00,000	1,30,000
1&2	3,15,000 (2,00,000 +1,15,000)	4,75,000 (2,90,000 +1,85,000)	1,60,000
2&3	3,85,000 (1,15,000 + 2,70,000)	6,20,000	2,35,000
1&3	4,40,000 (2,00,000 + 2,70,000)	6,90,000 (2,90,000 +4,00,000)	2,50,000
1 & 2 & 3	4,40,000 + 1,50,000 5,55,000 1,25,000 6,80,000	6,20,000 +2,90,000 9,10,000	2,30,000

Since, the NPV of 1 & 3 is Highest among all Project 1& 3 shall be selected.

Q 4. SPC – Module 1 - Q 17

Accept – Reject Decision based on NPV

MNP Ltd is planning to introduce a new product with a project life of 8 years. The project is to be set up in Special Economic Zone (SEZ), qualifies for one time (at starting) tax free subsidy from the State Government of ₹ 25,00,000 on capital investment. Initial Equipment cost will be ₹ 1.75 Crores. Additional Equipment costing ₹ 12,50,000 will be purchased at the end or the third year from the Cash Inflow of this year. At the end of 8 years, the Original Equipment will have no resale value, but the Additional Equipment can be sold for ₹ 1,25,000. A Working Capital of ₹ 20,00,000 will be needed and it will be released at the end of 8^{th} year. The project will be financed with sufficient amount of Equity Capital.
The sales volumes over 8 years have been estimated as follows –

Year	1	2	3	4-5	6-8
Units	72,000	1,08,000	2,60,000	2,70,000	1,80,000

A sale price of ₹ 120 per unit is expected and variable expenses will amount to 60% of sales Revenue. Fixed cash operating costs will amount ₹ 18,00,000 per year. The loss of any year will be set off from the profits of subsequent two years. The company is subject to 30% tax rate and considers 12 % to be an appropriate after tax cost of capital for this project. The company follows straight line method of depreciation.
Calculate the Net present value of the project and advise the management to take appropriate decision.

Solution :-

a) Calculation of Initial Investment

Cost of Equipment	1.75 cr.
(-) Subsidy by Govt.	(0.25cr)
(+) Working capital Requirement	0.20 cr
Initial Investment	1.70 cr

b) Calculation of Depreciation

For 1st Machine = $\frac{1.75 - 0.25}{8}$

= 18.75 Lakhs

For 2nd machine = $\frac{12.50 - 1.25}{5}$

= 2.25 lakhs

c) Inflows from the project

Particulars	1	2	3	4	5	6	7	8
Qty	72,000	1,08,000	2,60,000	2,70,000	2,70,000	1,80,000	1,80,000	1,80,000
Cotri. Per unit	48	48	48	48	48	48	48	48
Contribution	34.56	51.84	124.80	129.60	129.60	86.40	86.40	86.40
(-) FC	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)
(-) Dep.	(18.75)	(18.75)	(18.75)	(21)	(21)	(21)	(21)	(21)
EBT	-2.19	15.09	88.05	90.6	90.6	47.4	47.4	47.4
Tax @ 30%	0	3.87	26.415	27.18	27.18	14.22	14.22	14.22
EAT	-2.19	11.220	61.635	63.42	63.42	33.18	33.18	33.18
+ Dep.	18.75	18.75	18.75	21	21	21	21	21
CFAT	16.56	29.97	80.385	84.42	84.42	54.18	54.16	54.18

d) Calculation of NPV

Year	Cf	Df	D.C.F
0	(170)	1	(170)
1	16.56	0.892	14.785
2	29.97	0.797	23.891
3	80.385-12.5=67.885	0.711	48.319
4	84.42	0.635	53.650
5	84.42	0.567	47.902
6	54.18	0.506	27.449
7	54.18	0.452	24.508
8	54.18+1.25+20=75.43	0.403	24.508
			NPV=100.968

Q 5. SPC – Module 1 - Q 19

NPV based evaluation – Replacement decision – No Tax and Depreciation

Gems ltd has just installed machine R at a cost ₹ 2 lakhs. The machine has a 5 year life with no Residual value. The annual volume of production is estimated at 1,50,000 units, which can be sold at ₹ 6 per unit. Annual operating costs are estimated at ₹ 2 Lakhs (excluding depreciation) at this output level. Fixed costs are estimated ₹ 3 per unit for the same level of production.

The company has just come across another model Machine S, capable of giving the same output at an annual operating cost of ₹ 1.80 lakhs (excluding depreciation). There will be no change in fixed costs. Machine S costs ₹ 2.50 Lakhs, its residual value will be nil after a useful life of 5 years.

Gems Ltd has an offer for sale of Machine R for ₹ 1,00,000. The cost of dismantling and removal will be ₹ 30,000. As the Company has not yet commenced operations, it wants to dispose off Machine R and install Machine S.

The Company will be a zero-tax Company for 7 years in View of Incentives and Allowances available. Cost of Capital is 14 %.

Advise Whether the Company should opt for replacement. Will your answer be different if the Company has not installed Machine R and is in the process of selecting either R or S?

Solution :-

Computation of CFAT and Pure Decision

Particulars	Machine R	Machine S
Sale Value(15,00,000 × 6)	9,00,000	9,00,000
Less: Operating	2,00,000	1,80,000
Contribution	7,00,000	7,20,000
Less: Fixed Cost (1,50,000 × 3)	4,50,000	4,50,000
CFAT	2,50,000	2,70,000
P.V.A.F	3.4330	3.4330
P.V of Inflows	8,58,270	9,26,932
Less Initial Investment	2,00,000	2,50,000
NPV	6,58,270	6,76,932

Since, there is no need to Computation of Tax so we will not Going to Deduct & Add-back Depreciation.

Conclusion: Since, NPV of Machine & is More than machine R. hence, machine S is better option.

Replacement of machine R with S

Sr.no	Particulars	₹
a)	Purchase the Cost of Machine	2,50,000
b)	NRV of Machine R(1,00,000 -30,000)	70,000
c)	Net Initial outflow in year 0 Due to Replacement Decision	1,80,000
d)	Incremental cash inflow from S (2,70,000 -2,50,000)	20,000
e)	P.V Annuity F. @ 14%	3.432
f)	P.V of Incremental Cash Flow Due to Replacement	68,640

Q 6.

Mutually Exclusive Decisions – Modify & Retain vs Replace – Incremental NPV approach

H Ltd has a number of machines that were used to make a product that the company has phased out of its operations. The existing machine was originally purchased 6 years ago for ₹ 5,00,000 and is being depreciated by the straight line method, its remaining life is 4 years. Depreciation charges are ₹ 50,000 per year.

No Salvage Value is expected at end of its useful life. It can currently be sold for ₹ 1,50,000. The machine can also be modified at a cost of ₹ 2 Lakhs to produce another product. Modifications would not affect the useful life, or salvage value, and would be depreciated using the Straight-Line Method.

If the Company does not modify the existing machine, it will have to buy a new machine at a cost of ₹ 4,40,000 (no salvage value) and the new machine would be depreciated over 4 years. The Company's Engineers estimate that the cash operating Cost with the new machine would be ₹ 25,000 per year.

less than with the existing machine.

The cost of capital is 15% and corporate tax rate is 55%. Advice the company whether the new machine should be bought or the old equipment modified.

Solution :-

Calculation of Value of Original Machine

Original Purchase cost of Existing machine	5,00,000
(-) Depreciation Charge For 6 Years	3,00,000
Book Value Before Capitalisation of Modification Costs	2,00,000
Add: Modification Cost Capitalized	2,00,000
Machine Value for Depreciation purpose	4,00,000

	If old Machine is Modified	If New Machine is Purchased
i) Initial cash Investment	2,00,000	2,90,000
ii) Salvage Value at end of Year	Nil	Nil
iii) Depreciation	1,00,000 (4,00,000 ÷ 4)	1,10,000 (4,40,000 ÷ 4)

Note:- For the Calculation of Depreciation the machine cost is 2,00,000 & = 4,00,000 whereas for calculation of initial investment the amount is 2,00,000 since, current outflow is only 2,00,000

When we buy new machine we have sold out the old machine at 1,50,000 that's why this amount is deducted from initial investment.

Calculation of CFAT

Particular (Incremental)	Computation	₹
Saving with new Machine	Given	25,000
Less: Depreciation	1,10,000 –	10000
EBT	1,00,000	15,000
Less: Tax @ 55%		8250
EAT	15,000 ×	6750
Add: Depreciation	55%	10,000
CFAT	15000 - 8250	**16,750**

Calculation of Tax Saving:

Particulars	Amount (₹)
Value of Machine	2,00,000
Selling Price	1,50,000
Loss on Sale	50,000
× tax @ less 55% 1st year saving	27,500

Calculation of NPV

Year	Cf	D.F @ 15%	D.C.F
0	90,000	1	90,000
1	44,250	0.8695	38,475
2	16,750	0.7561	12,665
3	16,750	0.6575	11,013
4	16,750	0.5717	9576
		NPV	(18,271)

Since, New Machine is showing the Negative NPV Company should not Purchase the new One.

Q7. SPC – Module I - Q 24

EAB/EAC – Project Life Disparity

OM company which is in the 40% tax bracket, has to purchase any one of the two machines L and M for one of its factories. The following details are available in respect of the two machines –

Machine	L	M
Cost of machine, including installation costs	₹ 20,00,000	₹ 36,00,000
Useful life	5 years	8 years
Net operating income (before depreciation) from use of the machine	₹ 6,00,000	₹ 8,40,000

Note – The appropriate discount rate for the company is 12%

1. Using appropriate evaluation criterion, determine which machine should be purchased. Assume cash flows to perpetuity and that the cost of removal of the assets at the end of their useful life will be equal their salvage values.
2. Would your answer to (1) above be different, if net operating incomes of machine M were ₹ 8,80,000 instead ₹ 8,40,000.

Solution :-

a) Calculation of Depreciation

Particulars	L	M
Cost	20,00,000	36,00,000
Useful Life	5 Year	8 Year
Depreciation	4,00,000	4,50,000

b) Calculation of EAB/Cost

Particulars	L	M
CFBT	6,00,000	8,40,000
(-) Depreciation	(4,00,000)	(4,50,000)
PBT	2,00,000	3,90,000
(-) Tax @ 40%	(80,000)	(1,56,000)
PAT	1,20,000	2,34,000
+ Depreciation	4,00,000	4,50,000
CFAT	5,20,000	6,84,000
F.V.A.F	3.60477	4.96763
EAI	554819	724690
EAB /COST	34819	40690

L is Preferred Because of lower EAC

It is Always preferable to use equivalent annual f low method if projects lives are Different.

Q 8.

Capital Rationing

Venture Ltd has ₹ 30 Lakhs available for investment in capital projects. It has the option of making investment in projects 1, 2, 3 and 4. Each project is entirely independents and has a useful life of 5 years. The expected present values of Cash flows from the projects are as follows –

Projects	Initial Outlay	PV of Cash Flows
1	₹ 8,00,000	₹ 10,00,000
2	₹ 15,00,000	₹ 19,00,000
3	₹ 7,00,000	₹ 11,40,000
4	₹ 13,00,000	₹ 20,00,000

Which of the above investments should be undertaken?

Assume that cost of capital is 12% and risk free rate is 10% per annum. Given compounded sum of ₹ 1 at 10% in 5 years is ₹ 1.611 and discount factor of ₹ 1 at 12% rate for 5 years is 0.567

Solution :-

a) **Project Ranking based on NPV and PI**

Particulars	Project 1	Project 2	Project 3	Project 4
a) Discounted Cash Flows (given)	₹ 10,00,000	₹ 19,00,000	₹ 11,40,000	₹ 20,00,000
b) Initial Investment	₹ 8,00,000	₹ 15,00,000	₹ 7,00,000	₹ 13,00,000
c) NPV (a – b)	₹ 2,00,000	₹ 4,00,000	₹ 4,40,000	₹ 7,00,000
d) Rank based on NPV	IV	III	II	I
e) PI (a ÷ b)	1.25	1.27	1.63	1.54
f) Rank based on PI	IV	III	I	II

b) **Capital rationing on Divisible projects (i.e. Partial Investment is also allowed)**

i) In case of Divisible projects, PI is the criterion for decision – Making. Hence, the Projects with higher PI will be preferred.

ii) The fund allocation and NPV earned on divisible projects will be as under-

PI Rank	Project	Initial Investment	NPV
I (1.63)	Project 3	₹ 7,00,000	₹ 4,40,000
II (1.54)	Project 4	₹ 13,00,000	₹ 7,00,000
III (1.27)	Project 2	₹ 10,00,000 (bal. fig.)(Partial Inv.)	₹ 2,66,667
		₹ 30,00,000 (Funds available) (given)	₹ 14,06,667

Note – Pro-rata NPV on project 2 = $\frac{₹\ 4,00,000}{₹\ 15,00,000} \times ₹\ 10,00,000 = ₹\ 2,66,667$

c) Capital rationing on Indivisible projects (i.e. Partial Investment is not allowed)

Option	Description	Computation of Return	NPV earned
I	Invest in Projects 1,2&3	₹ 2L + ₹4L + ₹ 4.4L	₹ 10,40,000
II	totaling ₹ 30L Invest in	₹ 2L +₹4.4L + ₹7L +	₹ 15,22,687
	projects 1,3&4, totaling	₹ 1,82,687	
	₹28L balance ₹ 2L in		
	risk free deposits		

Note:

i) Balance ₹ 2,00,000 invested in Risk Free Deposits, will earn 10% return for 5 years.

ii) So, computed value of ₹ 2,00,000 at the end of 5 years, i.e. Maturity Value - ₹ 2,00,000 × 1.611 = ₹ 3,22,200

iii) Present Value of ₹ 3,22,200 (discounted at company's Cost of Capital 12%) = ₹ 3,22,200 × 0.567 = ₹ 1,82,687

Conclusion – The Company may choose projects 1, 3, 4 and invest balance ₹ 2 Lakhs at 10% for 5 years

Self Note :-

SWAPNIL PATNI'S CLASSES

Ch 2 - Leverage (Chart- 2.1)

Types of Leverage

Operating Leverage or Degree of Operating Leverage (DOL)

Taking advantage of operations of Business i.e., operating fixed cost

By increasing the **SALES** by a certain % we want to increase **EBIT** by a greater %

1) $\text{DOL} = \frac{\%\ \text{Change in EBIT}}{\%\ \text{Change in SALES}}$

OR

In other words, we are measuring the impact of FIXED COST

2) $\text{DOL} = \frac{\text{Contribution}}{\text{EBIT}}$

Formula (1) to be used when two situations are given. Whereas formula (2) to be used when only one situation is given.

Financial Leverage or Degree of Financial Leverage (DFL)

Taking advantage of financial structure of business i.e., fixed cost of finance - Interest

A) *Assuming that there are no preference shares*

By increasing the **EBIT** by a certain % we want to increase **EPS** by a greater %

1) $\text{DFL} = \frac{\%\ \text{Change in EPS}}{\%\ \text{Change in EBIT}}$

OR

In other words, we are measuring the impact of INTEREST COST

2) $\text{DFL} = \frac{\text{EBIT}}{\text{EBT}}$

Formula (1) to be used when two situations are given. Whereas formula (2) to be used when only one situation is given.

B) *Assuming that there are preference shares*

Now, assuming that preferance shares are given in question. We can now take advantage interest and preference dividend.

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT - Interest - [PD/(1-t)]}}$$

Combined Leverage or Degree of Combined Leverage (DCL)

Taking advantages of both operations and financial structure of business. i.e fixed cost of operations + fixed cost of finance i.e. Interest

A) *Assuming that there are no preference shares*

By increasing the **SALES** by a certain % we want to increase **EPS** by a greater %

1) $\text{DCL} = \frac{\%\ \text{Change in EPS}}{\%\ \text{Change in SALES}}$

OR

In other words, we are measuring the impact of both FIXED COST OF OPERATIONS & INTEREST COST

2) $\text{DCL} = \frac{\text{Contribution}}{\text{EBIT}}$

Formula (1) to be used when two situations are given. Whereas formula (2) to be used when only one situation is given.

B) *Assuming that there are preference shares*

Now, assuming that preferance shares are given in question. We can now take advantage of fixed cost of operations & interest & preference dividend.

$$\text{DCL} = \frac{\text{Contribution}}{\text{EBIT - Interest - [PD/(1-t)]}}$$

Ch 2 - Leverage (Chart- 2.2)

Assuming that there are no Preferance Shares

Particulars	Amount
Sales	XXX
(-) Variable cost	(XX)
Contribution	XXX
(-) Fixed Cost	(XX)
EBIT	XXX
(-) Interest	(XX)
EBT	XXX
(-) Taxes	(XX)
EAT or Net Income	XXX

Assuming that there are Preferance Shares

Particulars	Amount
Sales	XXX
(-) Variable cost	(XX)
Contribution	XXX
(-) Fixed Cost	(XX)
EBIT	XXX
(-) Interest	(XX)
EBT	XXX
(-) Taxes	(XX)
EAT	XXX
(-) Preference Dividend	(XX)
EAT or Net Income	XXX

Following are the 5 Important questions out of total 21 questions from

CH 2 – FINANCING DECISIONS LEVERAGE.

Which cover all the Important Adjustments.

Q 1. SPC – Module 1 – Q 15

Reverse Working Using Leverages

From the following financial data of Company A and Company B: Prepare their Income Statements.

Particulars	Company A (₹)	Company B (₹)
Variable Cost	56,000	60% of Sales
Fixed Cost	20,000	-
Interest Expenses	12,000	9,000
Financial Leverage	5 : 1	-
Operating Leverage	-	4 : 1
Income Tax Rate	30%	30%
Sales	-	1,05,000

Solution :-

i) Calculation of EBT Company A

$$DFL = \frac{EBIT}{EBT}$$

$$5 = \frac{EBIT}{EBT}$$

$$5 = \frac{EBT + Interest}{EBT}$$

$$5 = \frac{EBT + 12,000}{EBT}$$

$S EBT = EBT + 12,000$

$EBT = 3000$

ii) **Calculation of Contribution & EBIT of Company B**

Sales	=	1,05,000
(-) VC @ 60%	=	(63,000)
Contribution	=	42,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$4 = \frac{42,000}{EBIT}$$

$$EBIT = 10,500$$

iii) **Income statement**

Particulars	Company A (₹)	Company B (₹)
Sales	91,000	1,05,000
(-) Vc	(56,000)	(63,000)
Contribution	35,000	42,000
(-) FC	(20,000)	(31,500)
EBIT	15,000	10,500
(-) Interest	(12,000)	(9,000)
EBT	3000	1500
(-) Tax @ 30%	(900)	(450)
EAT	2100	1050

Note: In this Question, key to Solve the Problem is Financial leverage & operating Leverage.

Q 2. SPC – Module 1 - Q 17

Reverse Working with all Leverages –

The following details of RST Limited for the year ended 31st March, 2015 are given below :-

Operating Leverage	1.4 Times
Combined Leverage	2.8 Times
Income Tax Rate	30%
Fixed Cost (Excluding Interest)	₹ 2.04 Lakhs
Sales	₹ 30 Lakhs
12% Debentures of ₹ 100 each	₹ 21.25 Lakhs
Equity share capital of ₹ 10 each	₹ 17.00 Lakhs

a) Calculate financial leverage.

b) Calculate P/V ratio and Earning per Share (EPS)

c) If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets Leverage?

d) At what level of sales the Earning Before Tax (EBT) of the company will be equal to zero?

Solution :-

i) **Calculation of Financial Leverage**

$$\text{Financial Leverage} = \frac{\text{Combined leverage}}{\text{Operating Leverage}}$$

$$= \frac{2.8}{1.4}$$

$$= \textbf{2 times}$$

ii) Calculation of EBT

$$DFL = \frac{EBIT}{EBT}$$

$$2 = \frac{EBT + Interest}{EBT}$$

$$2 = \frac{EBT + 2,55,000}{EBT}$$

$$2\ EBT = EBT + 2,55,000$$

$$EBT = 2,55,000$$

iii) Calculation of EBIT

$$EBIT = Interest + EBT$$

$$= 2,55,000 + 2,55,000$$

$$EBIT = \mathbf{5,10,000}$$

iv) Calculation of Contribution

$$Contribution = FC + EBIT$$

$$= 2,04,000 + 5,10,000$$

$$Contribution = 7,14,000$$

v) Calculation of PV Ratio

$$PV\ Ratio = \frac{Contribution}{Sales}$$

$$= \frac{7,14,000}{30,00,000} \times 100$$

$$PV\ Ratio = 23.79\% \text{ or } 23.8\%$$

Means when I sale for 100 ₹, I get Contribution of 23.8%

vi) **Calculation of EPS**

EBIT	5,10,000
(-) Interest	(2,55,000)
EBT	2,55,000
(-) Tax @ 30%	(76,500)
EAT	1,78,500
No. of shares	1,70,000
EPS	1.05

➢ **Income Statement**

Refer 4 → 3 → 2

Particulars	(₹)
Sales	30,00,000
(-) Vc	(22,86,000)
Contribution	7,14,000
(-) FC	(2,04,000)
EBIT	5,10,000
(-) Interest	(2,55,000)
EBT	2,55,000
(-) Tax @ 30%	(76,500)
EAT	1,78,500

➢ **Calculation of Assets T/ O (Total Assets – Total Liability)**

$$\text{Assets T/O} = \frac{\text{Sales}}{\text{Total Asset}}$$

$$= \frac{30,00,000}{38,25,000}$$

$$= 0.7843$$

➢ **Calculation of Total Assets**

Total Assets = Total Funds

= Debt + Equity

= 21.25 lakhs + 17.00 lakhs

= **38.25 lakhs**

Conclusion: Compare to Industry standard, the firm has low asset leverage.

➢ **Calculation of Sales to get EBT Zero**

Particulars	(₹)
Sales	19,28,571
(-) Vc	(14,69,571)
Contribution	4,59,000
(-) FC	(2,04,000)
EBIT	2,55,000
(-) Interest	(2,55,000)
EBT	0

Reverse Calculation

P V Ratio = 4,59,000 – 23.8%

? – 100.00%

$$\text{Sales} = \frac{4,59,000 \times 100}{23.8}$$

= **19,28,571**

Q 3. SPC – Module 1 - Q 19

WACC, ROI, ROE, Segmentation of ROE and Leverage with Preference Capital

The net sales of A Ltd. is ₹ 30 crores. Earnings before interest and tax of the company as a percentage of net sales is 12%. The capital employed comprises ₹ 10 crores of equity, ₹ 2 crores of 13% Cumulative Preference Share Capital and 15% Debentures of ₹ 6 crores. Income-tax rate is 40%.

i) Calculate the Return-on-equity for the company and indicate its segments due to the presence of Preference Share Capital and Borrowing (Debentures).

ii) Calculate WACC for the above company.

iii) Calculate the Operating Leverage of the Company given that combined leverage is 3

Solution :-

Profitability Statement

Particulars	Amount (₹)
EBIT x 30 (r x 12%)	3,60,00,000
(-) Interest 6 (r = 15%)	90,00,000
EBT	2,70,00,000
(-) Tax (r -40%) x 2,70,00,000	1,08,00,000
EAT	1,62,00,000
(-) Pref. Dividend (13 % x 2,00,00,000)	26,00,000
EPES	1,36,00,000
Equity	10,00,00,000
Total Instrument (10 + 2+ 6)	18,00,00,000

$$\text{Return on Equity} = \frac{\text{Residual}}{\text{Total Equity}}$$

$$= \frac{1,36,00,000}{10,00,00,000}$$

$$= 13.6\%$$

$$\text{Return on Investment} = \frac{\text{EBIT}}{\text{Total Investment}}$$

$$= \frac{3,60,00,000}{18,00,00,000}$$

$$= 20\%$$

$$\text{Degree of Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}}$$

$$= \frac{3,60,00,000}{2,70,00,000 - 43,33,333}$$

$$= \frac{3,60,00,000}{2,26,66,667}$$

$$= 1.5882 \text{ times}$$

Since, the Dividend is Not Debited to P & I all he Could not get the tax benefit if Preferential Dividend Would have Debited to P & I all then Company Would have to pay lesser tax, in fact Company has lost the benefit of tax.

Hence, 26,00,000 ÷ 60% = 43,33,333

DCL = DOL * DFL

3 = DOL = 1.5882

DOL = 1.5889

In above questions, the Key was financial leverage Very Important to understand & remember effect of Pref. Dividend, ROE & ROI.

Q 4. **SPC – Module 1 - Q 21**

ROI and Effect of Change in EBIT on Leverage

A firm has sales of ₹ 75,00,000 variable cost is 56% and fixed cost is ₹ 6,00,000. It has a debt of ₹ 45,00,000 at 9% and equity of ₹ 55,00,000.

i) What is the firm's ROI?

ii) Does it have favorable financial leverage?

iii) If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?

iv) What are the operating, financial and combined leverages of the firm?

v) If the sales is increased by 10% by what percentage EBIT will increase?

vi) At what level of sales the EBT of the firm will be equal to zero?

vii) EBIT increases by 20%, by what percentage EBT will increase?

Solution :-

Income Statement

Particulars	Amount (₹)
Sales	75,00,000
(-) Variable Cost (56% of 75,00,000)	42,00,000
Contribution	33,00,000
(-) Fixed Costs	6,00,000
Earning before Interest & Tax (EBIT)	27,00,000
(-) Interest on Debt (@ 9% on ₹ 45 Lakhs)	4,05,000
Earning before Tax (EBT)	22,95,000

1) $ROI = \frac{EBIT}{Capital\ Employed} \times 100$

$= \frac{EBIT}{Equity + Debt} \times 100$

$= \frac{27,00,000}{55,00,000 + 45,00,000} \times 100$

$= 27\%$ (ROI is calculated on Capital Employed)

2) ROI = 27% and Interest on debt is 9%, hence, it has a favorable financial leverage.

3) $Capital\ Turnover = \frac{Net\ Sales}{Capital}$

$= \frac{₹\ 75,00,000}{₹\ 1,00,00,000}$

$= 0.75$

Which is very low as compared to industry average of 3.

4) Calculation of Operating, Financial and Combined leverages

a) $Operating\ Leverage = \frac{Contribution}{EBIT} = \frac{33,00,000}{27,00,000} = 1.22$

b) $Financial\ Leverage = \frac{EBIT}{EBT} = \frac{27,00,000}{22,95,000} = 1.18$

c) $Combined\ Leverage = \frac{Contribution}{EBT} = \frac{33,00,000}{22,95,000} = 1.44$

Or = Operating Leverage × Financial Leverage = 1.22 × 1.18 = 1.44

4) Operating leverage is 1.22. So if sales is increased by 10%. EBIT will be increased by 1.22 × 10 i.e. 12.20% (approx)

5) Since the combined Leverage is 1.44, sales have to drop by 100/1.44 i.e. 69.44% to bring EBT to Zero

Accordingly, New Sales = ₹ 75,00,000 × (1 - 0.6944)

= ₹ 75,00,000 × 0.3056

= ₹ 22,92,000 (approx)

Hence at ₹ 22,92,000 sales level EBT of the firm will be equal to Zero.

Financial leverage is 1.18. So, if EBIT increases by 20% then EBT will increase by 1.18 × 20 = 23.6% (approx)

Q 5. SPC – Module 1 - Q 18

Financing Pattern and effect on EPS

Delta Ltd. currently has an equity share capital of ₹ 10,00,000 consisting of 1,00,000 Equity share of ₹ 10 each. The company is going through a major expansion plan requiring to raise funds to the tune of ₹ 6,00,000. To finance the expansion the management has following plans:

Plan-I : Issue 60,000 Equity shares of ₹ 10 each

Plan-II : Issue 40,000 Equity shares of ₹ 10 each and the balance through long-term borrowing at 12% interest p.a.

Plan-III : Issue 30,000 Equity shares of ₹ 10 each and 3,000, 9% Debentures of ₹ 100 each

Plan-IV : Issue 30,000 Equity shares of ₹ 10 each and the balance through 6% preference shares.

The EBIT of the company is expected to be ₹ 4,00,000 p.a. assume corporate tax rate of 40%. Required:

i) Calculate EPS in each of the above plans.

ii) Ascertain financial leverage in each plan

Solution :-

Calculation of EPS

Particulars	Plan I	Plan II	Plan III	Plan IV
No. of Eq. shares issued	6,00,000 (60,000×10)	4,00,000 (40,000×10)	3,00,000 (30,000×10)	3,00,000 (30,000×10)
Long-Term Borrowings @ 12%	-	2,00,000	-	-
9% Debenture	-	-	3,00,000 (3000 × 100)	-
6% Pref. share	-	-	-	3,00,000
Interest on Long-Term Borrowings	-	24,000	-	-
Interest on Debenture	-	-	27,000	-
Dividend on Pref. share	-	-	-	18,000
EBIT	4,00,000	4,00,000	4,00,000	4,00,000
(-) Interest	-	(24,000)	(27,000)	-
EBT	4,00,000	3,76,000	3,73,000	4,00,000
(-) Tax @ 40%	(1,60,000)	(1,50,400)	(1,49,200)	(1,60,000)
EAT	2,40,000	2,25,600	2,23,800	2,40,000
(-) Pref Div.	-	-	-	18,000

Earnings for eq. holders	2,40,000	2,25,600	2,23,800	2,22,000
No. of Share	60,000	40,000	30,000	30,000
EPS	4	5.64	7.46	7.4
Financial Leverage = EBIT / EBT	1	1.063	1.072	1.04

Plan IV

$$DFL = \frac{EBIT}{EBT - \text{Preference Dividend}}$$

$$= \frac{4,00,000}{4,00,000 - 30,000}$$

$$= 1.08$$

$$60\% = 18,000$$

$$100\% = \frac{18,000 \times 100}{60}$$

$$= 30,000$$

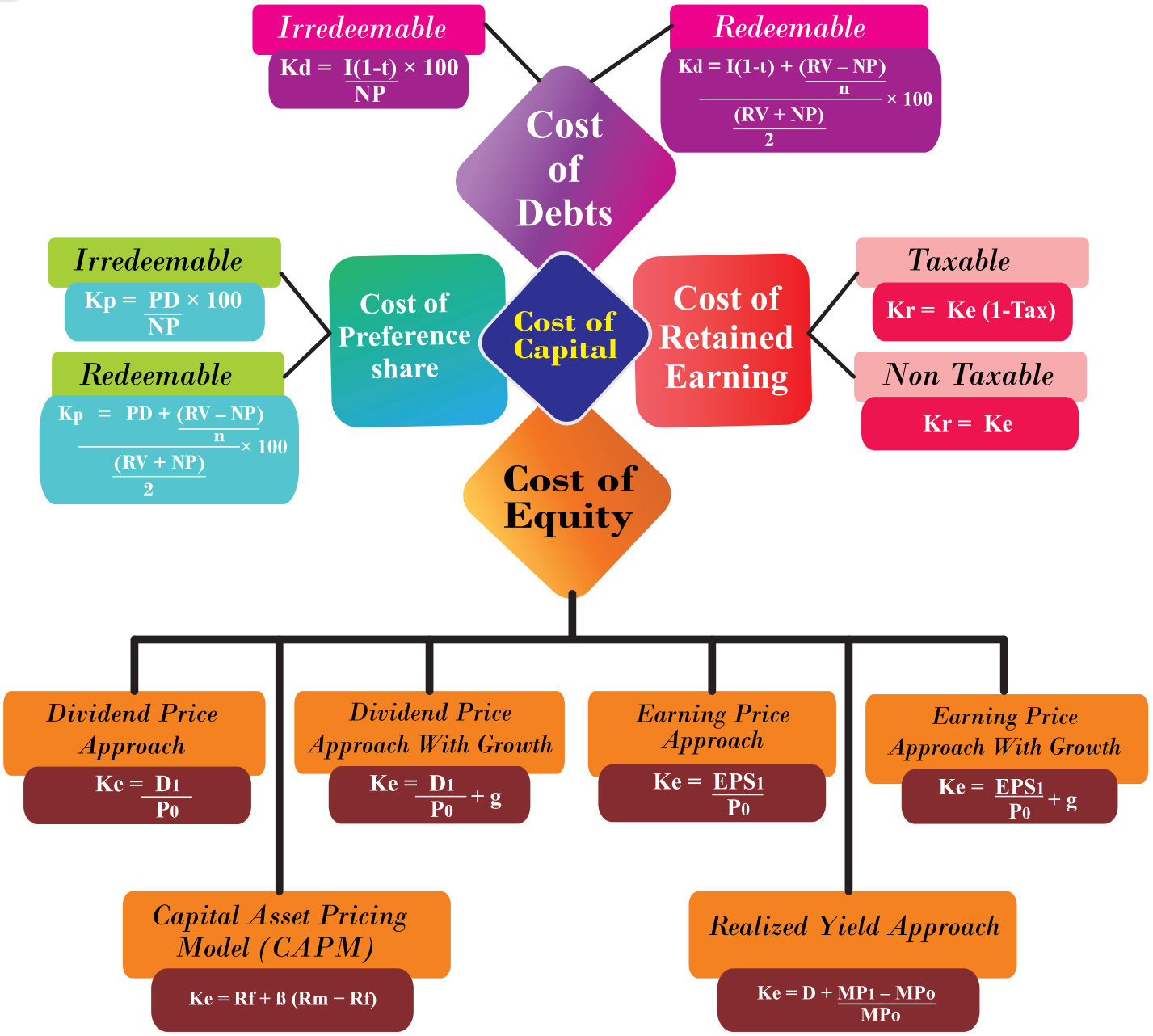
= In short, we are not going tax saving on preference Dividend

Self Note:-

Chapter 2

Chapter 2

Ch 3 - COST OF CAPITAL (Chart- 3.1)



Ch 3 - COST OF CAPITAL (Chart- 3.2)

Weighted Average Cost of Capital (WACC)

Using Book Value Weights

1)The weights used are derived from book value of different sources of finance as per books of accounts.
2) Retained earnings to be Included.
3)Always calculate weights for total value of Capital (Take proportion of total values as per books of accounts)

Using Market Value Weights

1)The weights used are derived from market value of different sources of finance as per prevailing market rates.
2)Retained earnings ignored.
3)Always calculate weights for total value of capital (Take proportion of total market values as per prevailing market prices)

Format for calculation of WACC or K_0

Source of Finance	Book Value or Market Value	Weights	Individual cost of Capital	WACC
Equity Capital	XX	W1	K_e	$K_e \times W1$
Preference Capital	XX	W2	K_p	$K_p \times W2$
Retained earning	XX	W3	K_e	$K_e \times W3$
Debt	XX	W4	K_d	$K_d \times W4$
Total	XXX	Total of above		K_o = WACC

Following are the 8 Important questions out of total 21 questions from CH 3 – Cost of Capital.

Which cover all the Important Adjustments.

Q 1. SPC – Module 1 - Q 6

Computation of Cost of Equity, Cost of Debt

ABC Company's Equity share is quoted in the market at ₹ 25 per share currently. The company pays a dividend of ₹ 2 per share and the investor's market expects a growth rate of 6% per year. You are required to:

a) Calculate the company's Cost of Equity Capital.

b) If the Anticipated Growth Rate is 8% p.a., calculate the indicated Market price per share.

c) If the company issues 10% Debentures of face value of ₹ 100 each and realizes ₹ 96 per Debenture while the debenture are redeemable after 12 years at a premium of 12 %, what will be the cost of debentures? (Tax = 50%)

Chapter 3

Solution :-

a) **Calculation of Cost of Equity Capital**

$$Ke = \frac{D_1}{P_0} + g$$

$$= \frac{2 + 6\%}{25} + 6\%$$

$$= \frac{2.12}{25} + 6\%$$

$$= 14.48\%$$

b) Calculation of Market price per share

$$Ke = \frac{D_1}{P_0} + g$$

$$14.48 = \frac{2.16}{P_0} + 8\%$$

$$6.48 = \frac{2.16}{P_0}$$

$$P_0 = 33.33\ \%$$

c) Calculation of Cost of Debenture

$$Kd = \frac{\text{Interest} \times (1 - \text{tax}) + \frac{RV - NP}{n}}{\frac{RV + NP}{2}}$$

$$Kd = \frac{10\,(1 - 0.50) + \frac{112 - 96}{12}}{\frac{112 + 96}{2}} \quad \text{(without Tax)}$$

$$= 6.08\%$$

OR

$$Kd = \frac{10\,(1 - 0.50) + \frac{112 - 96}{12} \times (1 - 0.5)}{\frac{112 + 96}{2}}$$

$$= 5.12\%$$

Q 2. SPC – Module 1 - Q 6a

Cost of Equity – Different Approaches

Pogo Ltd has an EPS of ₹ 9 per share. Its Dividend payout ratio is 40%. Its Earning and Dividends are expected at 5% per annum. Find out the cost of Equity Capital under various approaches, if its Market Price is ₹ 36 per share.

Solution :-

a) Dividend price approach

$$K_e = \frac{D_1}{P_0}$$

$$= \frac{3.78}{36}$$

$$= 10.5\%$$

b) Divided Price with Growth

$$K_e = \frac{D_1}{P_0} + g$$

$$= \frac{3.78}{36} + 5\%$$

$$= 15.5\%$$

c) Earning price Approach

$$K_e = \frac{EPS_1}{P_0}$$

$= \frac{9.45}{P_0}$

$= 26.25\%$

d) Earning price Approach with growth

$K_e = \frac{EPS_1}{P_0} + g$

$= \frac{9.45}{36} + 5\%$

$= 31.25\%$

Q 3. SPC – Module 1 - Q 6b

Cost of Equity – Realized Yield Approach

GTAYCT Ltd is a large company with several thousand shareholders. Investors buy 100 shares of the company at the beginning of the year at a market price of ₹ 225. The par value of each share is ₹ 10. During the year, the company pays a dividend at 25%. The price of the share at the end of the year is ₹ 267.50. Calculate the total return on the investment. Suppose the investor seels the shares ta end of the year, what would be the cash inflows at the end of the year.

Solution :-

a) Calculation of Cost of Equity

$Ke = \frac{D_1 (P_1 - P_0)}{P}$

$$= \frac{100 \times 2.5 + (267.50 - 225) \times 100}{225 \times 100}$$

$$= \frac{4500 \times 100}{22,500}$$

= 20 % (Ke as per Realized Yield Approach)

b) Calculation of total Return / Earning

Total Return / Earning = K_e × Market price per share × No. of shares

= 20% × 225 × 100

= 4500

c) Calculation of Cash Inflow

Cash Inflow = (Market price at the end of the year × No. of Share) + (Dividend per share × No. of share)

= (267.50 × 100) + (2.5 × 100)

= 27,000

Q 4. SPC – Module 1 - Q 6c

Cost of Equity – CAPM Approach

Calculate the Cost of Equity Capital of H Ltd whose Risk Free Return equals 10%. The firm's beta is 1.75 and the Return on the Market Portfolio is 15%.

Solution :-

Ke = Rf + ß(Rm – Rf)

= 10% + 1.75 (15 -10)

= 10 + 8.75 = 18.75%

Q 5. SPC – Module 1 - Q 18

Computation of WACC

Pooja Ltd. has the following book value capital structure:

Particulars	Amt (₹)
Equity Capital (in shares of ₹ 10 each, fully paid up- at par)	₹ 15 Cr
11% Pref. Capital (In shares of ₹ 100 each, fully paid up- at par)	₹ 1 Cr
Retained Earnings	₹ 20 Cr
13.5% Debentures (of ₹ 100 each)	₹ 10 Cr
15% Term Loans	₹ 12.5 Cr

The next expected dividend on equity shares per share is ₹ 3.60; the dividend per share is expected to grow at the rate of 7%. The market price per share is ₹ 40.

Preference stock, redeemable after 10 years, is currently selling at ₹ 75 per share.

Debentures, redeemable after six years, are selling at ₹ 80 per debenture.

The Income tax rate for the company is 40%.

i) Required Calculate the current weighted average cost of capital using:

a) book value proportions; and

b) market value proportions.

ii) Define the weighted marginal cost of capital schedule for the company, if it raises ₹ 10 crores next year, given the following information:

a) The amount will be raised by equity and debt in equal proportions;

b) The company expects to retain ₹ 1.5 crores earnings next year;

c) The additional issue of equity shares will result in the net price per share being fixed at ₹ 32;

d) The debt capital raised by way of term loans will cost 15% for the first ₹ 2.5 crores and 16% for the next ₹ 2.5 crores.

Solution :-

i) **Statement showing computation of weighted average cost of capital by using Book value proportions.**

Source of finance	Amt (Book value) (₹ in cr.)	Weight (BV proportion) (a)	Cost of capital (%) (b)	Weighted cost of capital (%) (c)=(a)× (b)
Equity capital (W.N.1)	15.00	0.256	16.00	4.096
11% Preference capital (W.N.2)	1.00	0.017	15.43	0.262
Retained Earnings (W.N.1)	20.00	0.342	16.00	5.472
13.5% Debentures (W.N.3)	10.00	0.171	12.70	2.171
15% term loans (W.N.4)	12.50	0.214	9.00	1.926
	58.50	1.00		13.927

ii) **Statement showing computation of weighted average cost of capital by using market value proportions.**

Source of finance	Amount (Book value) (₹ in cr.)	Weight (Book value proportion) (a)	Cost of capital (%) (b)	Weighted cost of capital (%) (c) = (a)× (b)
Equity capital (W.N.1)	60.00 (1.5cr × ₹ 40)	0.739	16.00	11.824
11% Preference capital (W.N.2)	0.75 (1L × ₹ 75)	0.009	15.43	0.138
13.5% Debentures (W.N.3)	8.00 (10L × ₹ 75)	0.098	12.70	1.245
15% term loans (W.N.4)	12.50	0.154	9.00	1.386
	81.25	**1.00**		**14.593**

[**Note:** Since retained earnings are treated as equity capital for purposes of calculation of cost of specific source of finance, the market value of the ordinary shares may be taken to represent the combined market value of equity shares and retained earnings. The separate market values of retained earnings and ordinary shares may also be worked out by allocating to each of these a percentage of total market value equal to their percentage share of the total based on book value.]

Working Notes (W.N.):

1) Cost of equity capital and retained earnings (K_e)

$$Ke = \frac{D_1}{P_0} + g$$

Where,

K_e = Cost of equity capital

D_1 = Expected dividend at the end of year 1

P_0 = Current market price of equity share

g = Growth rate of dividend

Now, it is given that D_1 = ₹3.60, P_0 = ₹ 40 and g = 7%

Therefore,

$$Ke = \frac{₹\ 3.60}{₹\ 40} + 0.07$$

K_e = 16%

2) Cost of Preference Share Capital (K_p)

$$Kp = \frac{PD + \frac{RV - NP}{n}}{\frac{RV + NP}{2}}$$

Where,

PD = Preference dividend

RV = Redeemable value of preference shares

NP = Current market price of preference shares

N = Redemption period of preference shares

Now, it is given that PD = 11%, RV = ₹ 100, NP = ₹ 75 and n = 10 years

$$\text{Therefore, } Kp = \frac{₹11 + \frac{₹100 - ₹75}{10}}{\frac{₹100 + ₹75}{2}} \times 100$$

$$Kp = 15.43\%$$

3) **Cost of Debenture (Kd)**

$$Kd = \frac{I(1-t)\left[\frac{RV - NP}{n}\right]}{\left[\frac{RV + NP}{2}\right]}$$

Where,

I = Interest payment

t = Tax rate applicable to the company

RV = Redeemable value of debentures

NP = Current market price of debentures

n = Redemption period of debentures

Now it is given that I = 13.5, t = 40%, RV = ₹100, NP = ₹80 and n = 6 yr

$$\text{Therefore, } Kd = \frac{₹13.5(1-0.40) + \left[\frac{₹100 - ₹80}{6}\right]}{\left[\frac{₹100 + ₹80}{2}\right]} \times 100$$

$$Kd = 12.70\%$$

4) **Cost of Term Loans (Kt)**

$K_t = r(1-t)$

Where, r = Rate of interest on term loans

t = Tax rate applicable to the company

Now, $r = 15\%$ and $t = 40\%$

Therefore, $K_t = 15\% (1 - 0.40)$

$K_t = 9\%$

iii) **Statement showing weighted marginal cost of capital schedule for the company, if it raises ₹ 10 crores next year, given following information:**

Source of finance	Amount (₹ in cr)	Weight (a)	After tax Cost of capital (%) (b)	WACC (%) (c) = (a) x (b)
Equity shares (W.N.5)	3.5	0.35	18.25	6.387
Retained earnings	1.5	0.15	18.25	2.737
15 % Debt (W.N. 6)	2.5	0.25	9.00	2.250
16% Debt (W.N. 6)	2.5	0.25	9.60	2.400
	10.00	1.00		13.774

Working Notes (W.N.):

5) **Cost of Term Loans (K_t)** (including fresh issue of equity shares)

$$Ke = \frac{D_1}{P_0} + g$$

Now, $D_1 = ₹ 3.60$, $P_0 = ₹ 32$ and $g = 0.07$

Therefore, $Ke = \frac{₹ 3.60}{₹ 32} + 0.07$

$= 18.25\%$

6) Cost of debt (K_d) = $r(1-t)$ (For first ₹ 2.5 crores)

r = 15% and t = 40%

Therefore, K_d = 15% (1- 40%) = 9% (For the next 2.5 crores)

r = 16% and t = 40%

Therefore, K_d = 16% (1 - 40%)

K_d = 9.6%

Q 6. SPC – Module 1 - Q 19

Cost of Capital – Cost of Equity, Debt, Preference, WACC, Marginal WACC

The Sneha Ltd. has following capital structure at 31st December 2015, which is considered to be optimum:

Particulars	Amount (₹)
13% Debenture	3,60,000
11% Preference share capital	1,20,000
Equity share capital (2,00,000 shares)	19,20,000

The company's share has a current market price of ₹ 27.75 per share. The expected dividend per share in next year is 50 percent of the 2015 EPS. The EPS of last 10 years is as follows. The past trends are expected to continue.

Year	2006	2007	2008	2009	2010	2011	2012
EPS (₹)	1.00	1.120	1.254	1.405	1.574	1.762	1.974

The company can issue 14 percent new debenture. The company's debenture is currently selling at ₹ 98. The new preference issue can be sold at a net price of ₹ 9.80, paying a dividend of ₹1.20 per share. The company's marginal tax rate is 50%.

i) Calculate the after tax cost (a) of new debts & new preference share capital, (b) of ordinary equity, assuming new equity comes from retained earnings.

ii) Calculate the marginal cost of capital.

iii) How much can be spent for capital investment before new ordinary share must be sold? (Assuming that retained earnings available for next year's investment is 50% of 2015 earnings.)

iv) What will be marginal cost of capital (cost of fund raised in excess of amount calculated in part (iii) if the company can sell new ordinary shares to net ₹ 20 per share ? Cost of debt and of preference capital is constant.

Solution :-

a) **Calculation of Growth Rate**

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015
Increme-	0.12	0.134	0.151	0.169	0.188	0.262	0.2369	0.2653	0.2971
ntal EPS									
(₹)									
EPS_0	1	1.120	1.254	1.405	1.574	1.762	1.974	2.2109	2.4762
Growth	12.1	11.96	12.04	12.02	11.94	12.03	12.00	11.99	11.99

b) **Calculation of Cost of Equity**

$$Ke = \frac{D_1}{P_0} + g$$

$$= \frac{2.7733 \times 50\%}{27.75} + 0.12$$

$$= 16.99\ \%$$

c) **Calculation of Cost of Preference shares**

$$K_p = \frac{PD}{NP} \times 100$$

$$= \frac{1.20}{9.80} \times 100$$

$$= 12.24\ \%$$

d) **Calculation of Cost of Debt**

$$K_d = \frac{\text{Interest} \times (1 - t)}{NP}$$

$$= \frac{14 \times (0.50)}{98}$$

$$= 7.14\ \%$$

e) **Calculation of WACC**

Type	Amount	Weight	Cost	WACC
Equity	19,20,000	80	17	13.6
Preference	1,20,000	5	12.24	0.612
Debenture	3,60,000	15	7.14	1.071
				15.283

Note:

Since, it is given in the question. That existing Combination is optimum means this Combination is gaining minimum WACC, so Company will issue new capital in same Proportion.

2,77,300 = 80%

? = 100%

3,46,625 = 100%

Equity	Debt	Preference
80%	15%	5%
2,77,300	51,994	17,331

Retained Earnings available for Further Investment

= 50% of 2015 EPS

= 50% × 2.7733 × 2,00,000 = 2,77,300

Hence, the amount to be used by way of Retained Earnings, before selling new ordinary share = 2,77,300

As Equity = 80% of Total Funds,

The Total Capital before issuing fresh Equity shares = $\frac{2,77,300}{80\%}$

= 3,46,625

New Ke = $\frac{50\% \times 2.7733}{20} + 0.12$

= 18.93%

WACC Calculation

Type	Amount	Weight	Cost	WACC
Equity	19,20,000	80	18.93	15.144
Preference	1,20,000	5	12.24	0.612
Debenture	3,60,000	15	7.14	1.071
				16.827

Q 7. SPC – Module 1 – Q 15

Computation of K_d , K_e and WACC

Macro Limited wishes to raise additional finance of ₹ 10 lakhs for meeting its investment plans. It has ₹ 2,10,000 in the form of retained earnings available for investment purposes. Further details are as following-

1)	Debt / equity mix	30% / 70%
2)	Cost of debt - Upto ₹ 1,80,000	10% (before Tax)
	- Beyond ₹ 1,80,000	16% (before Tax)
3)	Earnings per share	₹ 4
4)	Dividend pay out	50% of earnings
5)	Expected growth rate in dividend	10%
6)	Current market price per share	₹ 44
7)	Tax rate	50%

You are required:

a) To determine the pattern for raising the additional finance.

b) To determine the post-tax average cost of additional debt.

c) To determine the cost of retained earnings and cost of equity, and

d) overall weighted average after tax cost of additional finance.

Solution:-

a) **Pattern of Raising additional Finance**

Equity 70% of ₹ 10,00,000 = ₹ 7,00,000

Debt 30% of ₹ 10,00,000 = ₹ 3,00,000

The capital structure after raising additional Finance

Particulars	Amount (₹)
Equity Capital of (7,00,000 - 2,10,000)	4,90,000
Retained Earnings	2,10,000
Debt (Internet at 10% P.a)	1,80,000
Debt (Internet at 16% P.a) (3,00,000 -1,80,000)	1,20,000
Total Funds	**10,00,000**

b) **Calculation of Cost of Equity**

$$Ke = \frac{D_1}{P_0} + g$$

$$= \frac{(4 \times 50\%) + 10\%}{44} + 10\%$$

$$= \frac{2 + 10\%}{44} + 10\%$$

$$= \frac{2.2}{44} + 10\%$$

$$= 5\% + 10\%$$

$$= 15\%$$

Calculation of WACC

Type	Amount	Weight	Cost	WACC
Equity	4,90,000	49%	15%	7.35%
Retained Earning	2,10,000	21%	15%	3.15%
Debt	1,80,000	5%	5%	0.9%
Debt	1,20,000	8%	8%	0.96%
				12.36%

Note: It is assumed that investor is not getting tax benefit an retained earning.

Conclusion:

If the Proposed Investment is giving higher return than 12.36% then Company should invest.

Q 8. The Capital Structure of SPAV Ltd. Is As Follows :-

Particulars	Amount (₹)
11% Debenture	₹ 8,50,000
16% Preference Share	₹ 9,00,000
Equity share Capital	₹ 15,00,000 (₹ 10 each)
Retained Earning	₹ 7,50,000

i) On retained earnings, the expected Rate of Return to the shareholders, if they had Invested the funds else were is 10% and Brokerage is 3%.

ii) 100 per Debenture, Redeemable at par has Flotation Cost of 3% and 10 years of Maturity. The market price per Debenture is 105 Rs.

iii) 100 per Pref. share redeemable at par has 3 % Flotation cost and 5 Years maturity. The market price per Pref. share is 106.

iv) Equity shares has ₹ 5 Flotation cost and market price per share is ₹30.EPS of the Company is ₹ 5 with Dividend pay-out Ratio of 50% and Annual growth is 10%.

v) Tax rate is applicable @ 30 % for all. You are required to calculate WACC with both Values i.e. market & Book Values.

Solution :-

a) Computation of Ke

WN-1 Dividend per share = EPS × Payout Ratio

= 5 × 50%

= 2.50

$$Ke = \frac{D_1}{P_0} + g$$

$$= \frac{2.50 + 10\%}{30 - 5} + 0.10$$

$$= \frac{2.75}{25} + 0.10$$

= 21%

b) Computation of Kp

$$Kp = PD + \frac{(RV - NP)}{n}$$

$$\frac{(RV + NP)}{2}$$

$$= \frac{16 + \frac{100 - 103}{5}}{\frac{100 + 103}{2}}$$

$$= \frac{16 - 0.6}{101.5}$$

= 15.172 %

c) **Computation of Kd**

$$Kd = \frac{\text{Interest} \times (1 - \text{Tax}) + \frac{RV - NP}{n}}{\frac{RV + NP}{2}}$$

$$= \frac{11 \times (1 - .30) + \frac{100 - 102}{10}}{\frac{100 + 102}{2}}$$

$$= \frac{7.7 - 0.2}{101}$$

$$= 7.425\%$$

d) **Computation of Kr**

$$Kr = \frac{(7,50,000 \times 10\%) - 3\% \times (1 - .30)}{7,50,000}$$

$$= 6.79\%$$

e) **Computation of WACC as per Book Value Weights**

Types	Amount	Weight	Cost	WACC
Equity	15,00,000	0.375	21%	7.875
Preference	9,00,000	0.225	15.172%	3.4137
Debenture	8,50,000	0.2125	7.425%	1.5778
Retained	7,50,000	0.1875	6.79%	1.2731
				14.1396

f) Computation of WACC as per market Value weights

Type	Amount	Weight	Cost	WACC
Equity	45,00,000	70.90	21%	14.889
Preference	9,54,000	15.03	15.1721%	2.280
Debenture	8,92,500	14.06	7.425%	1.044
				18.213%

Self Note:-

Ch 4 - Capital Structure (Chart 4.1)

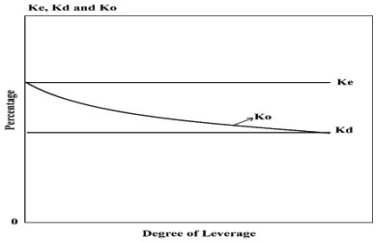
Capital Structure Theories

Net Income Approach

Assumption

- Kd = Debt Capitalization Rate
- Ke = Equity Capitalization Rate
- Kd is always less than Ke
- Kd & Ke remains constant for debt / equity mix

Diagram



Steps

1) EBIT

2) EBT (NI) = EBIT – Interest

3) Value of Equity (s) = $\frac{NI}{Ke}$

4) Value of Debt (D) = $\frac{Interest}{Kd}$

5) Value of firm (V) = S + D

6) Overall cost of capital (Ko) =

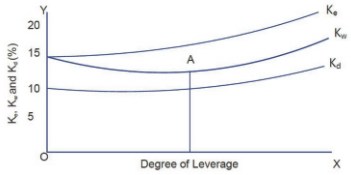
$\frac{EBIT}{V} \times 100$

Traditional Theory

Assumption

- Kd is always less than Ke
- Kd & Ke vary with change in debt equity mix
- Ke is more sleeper and higher than increse in Kd

Diagram

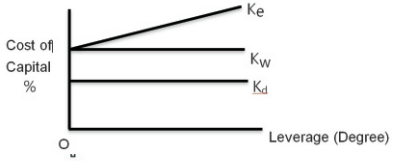


Net Operating Income Approach

Assumption

- Kd is always less than Ke
- Kd remains constant at all levels of debt-equity mix
- Ke is increases at debt content increases.
- Market capitalises value of firm as a whole without any importance of debt - equity mix

Diagram



Steps

1) EBIT

2) EBT = EBIT – Interest

3) Value of Firm (V) = $\frac{EBIT}{Ko}$

4) Value of Debt (D) = $\frac{Interest}{Kd}$

5) S = V - D

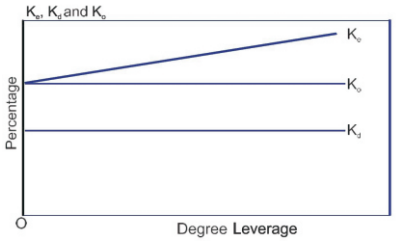
6) Ke = $\frac{EBIT\ or\ NI}{S} \times 100$

Modigliani-Miller Approach

MM Approach without Tax Assumption

- Kd is always less than Ke
- Kd remains constant at all levels of debt- equity mix
- Ke is increases at debt content increases.
- Market capitalises value of firm as a whole without any importance to Debt - Equity mix.
- Capital Market is perfect, investors are face to buy or sell securities, no transaction cost, investors can personally borrow without restrictions on same terms as firms do.
- Same risk class classification - if 2 firms have same capital emplyed and same EBIT

Diagram



MM Approach with Tax

I) Value of levered company = Market Value of unlevered firm + (Debt X Tax Rate)

ii) Cost of equity in a levered company (Keg) = Keu + (Keu – Kd) Debt / Debt + Equity

Ch 4 - Capital Structure (Chart 4.2)

Factors Determining Capital Structure

- Nature of Industry (small/ large scale)
- Gestation Period (Time required to settled the Business)
- Certainty of profits (More – Debt & Less – Equity)
- Quantum of Return on Investment (ROI to be compared to Cost of Funds)
- Lending Policy of Bank (Liberal / strict)
- Monetary and Fiscal policy of Govt.

Source	risk	cost	Control
Equity	Lowest	Highest	Is Diluted
Preference	Moderate	Moderate	Not Diluted
Debt	Highest	Lowest	Not Diluted

Capital Structure

Optimum capital structure

When cost of funds i.e. Minimum and wealth of firm is Maximum.
Here, EPS is also Maximum.

Appropriate Capital Structure

it Differs from company. In real life, Appropriate Structure is more relevant .
Major Features
1.Profitability 2.Flexibility 3.Conservation
4.Solvency 5.Control

Other Important Concepts

Financial BEP

It Is that level of EBIT At which EPS under a plan Is Zero

Let the EBIT be 'X'

$$\frac{(X - \text{Interest})(1-t) - PD}{\text{No. of equity share}} = 0$$

Indifference Point

It is that level of EBIT at which EPS under two Plans is same.

Let the EBIT be 'X' plan A and B.

$$\frac{(X - \text{Interest})(1-t) - PD}{\text{No. of equity share}}_{\text{Plan A}} = \frac{(X - \text{Interest})(1-t) - PD}{\text{No. of equity share}}_{\text{Plan B}}$$

Marginal Cost of capital:-

- *It is cost of raising an additional rupee of capital*
- *The word marginal means additional*
- *We compute cost of only additional / New Capital*

Following are the 9 Important questions out of total 24 questions from

CH 4 – Capital Structure.

Which cover all the Important Adjustments.

Q 1. SPC – Module 1 - Q 1

Net Income Approach – Valuation of Firm

The following data relates to four Firms –

Firm	A	B	C	D
EBIT	₹ 2,00,000	₹ 3,00,000	₹ 5,00,000	₹ 6,00,000
Interest	₹ 20,000	₹ 60,000	₹ 2,00,000	₹ 2,40,000
Equity Capitalization Rate	12%	16%	15%	18%

Assuming that there are no taxes and Interest rate on debt is 10%, Determine the value and WACC of each firm using the Net Income Approach. What happens if firm A borrows ₹ 2,00,000 at 10% to repay Equity Capital?

Solution :-

a) Computation of WACC

Firm	A	B	C	D
EBIT	2,00,000	3,00,000	5,00,000	6,00,000
(-) Interest	(20,000)	(60,000)	(2,00,000)	(2,40,000)
EBT	1,80,000	2,40,000	3,00,000	3,60,000
K_e (given)	12%	16%	15%	18%
Value of Equity (s) = $\frac{EBT}{K_e}$	15,00,000	15,00,000	20,00,000	20,00,000
Value of Debt (D) = $\frac{Int.}{K_d}$	20,000 / 10%	60,000 / 10%	2,00,000 / 10%	2,40,000 / 10%
	= 2,00,000	= 6,00,000	= 20,00,000	= 24,00,000

Value of firm (V) = (S +D)	15L + 2L = 17L	15L + 6L =21,00,000	20L + 20L =40,00,000	20L + 24L =44,00,000
WACC=EBIT / V × 100	2L / 17L × 100 = 11.76%	3L / 21L × 100 = 14.29%	5L / 40L × 100 = 12.5%	6L / 4.4L × 100 =13.64%

b) When firm A borrows ₹ 2,00,000 at 10% interest, repay Equity Capital, the effect on WACC will be as under.

Firm	Before	After
EBIT	2,00,000	3,00,000
(-) Interest	(20,000)	(40,000)
EBT	1,80,000	1,60,000
K_e (given)	12%	12%
Value of Equity (s) = EBT / K_e	15,00,000	13,33,333
Value of Debt (D) = Interest / K_d	20,000 / 10%	40,000 / 10%
	= 2,00,000	= 4,00,000
Value of firm (V) = (S +D)	15L + 2L	13,33,333 + 6L
	= 17L	=17,33,333
WACC = EBIT / V × 100	= 11.76%	= 11.54%

Conclusion: More proportion of Debt = Reduced WACC

Q 2. SPC – Module 1 - Q 2

Optimum Capital Structure –Traditional Theory

RST Ltd is expecting an EBIT of ₹ 4 Lakhs for F.Y. 2015- 16. Presently the company is financed entirely by Equity Share Capital of ₹ 20 Lakhs with equity capitalization rate of 16%. The company is contemplating to redeem a part of the capital by introducing Debt Financing. The company has two options to raise Debt to the extent of 30% or 50% of the total fund.

It is expected that for debt financing upto 30%, the rate of Interest will be 10% and equity Capitalization rate will increase to 17%. If the company opts for 50% debt, then the interest rate will be 12% and Equity Capitalization rate will be 20%.

You are required to compute the Value of the Company and its overall Cost of Capital under different options, and also state which is the best option.

Solution :-

Computation of WACC

Plan	Present – 0% Debt	Plan 1 – 30% Debt	Plan 2 – 50% Debt
Debt	Nil	6,00,000	10,00,000
Equity Capital	20,00,000	14,00,000	10,00,000
EBIT	4,00,000	4,00,000	4,00,000
(-) Interest	Nil	60,000	1,20,000
EBT	4,00,000	3,40,000	2,80,000
Ke	16%	17%	20%
Value of Equity (S)	25,00,000	20,00,000	14,00,000
$\left(\frac{EBT}{Ke}\right)$			

Value of Debt (D)	0	6,00,000	10,00,000
Value of Firm (V = S + D)	25,00,000	26,00,000	24,00,000
WACC = $\frac{EBIT}{V} \times 100$	16%	15.38%	16.67%

Therefore, Plan I is the best.

Q 3. SPC – Module I - Q 3

Net Operating Income Approach

Alpha Limited and Beta Limited are identical except for capital structures. Alpha Ltd. has 50 per cent debt and 50 per cent equity, whereas Beta Ltd. has 20 per cent debt and 80 per cent equity. (All percentages are in market-value terms). The borrowing rate for both companies is 8 per cent in a no-tax world, and capital markets are assumed to be perfect.

(a) i) If you own 2 per cent of the shares of Alpha Ltd., what is your return if the company has net operating income of ₹ 3,60,000 and the overall capitalisation rate of the company, K_0 is 18 per cent?

ii) What is the implied required rate of return on equity?

(b) Beta Ltd. has the same net operating income as Alpha Ltd.

i) What is the implied required equity return of Beta Ltd.?

ii) Why does it differ from that of Alpha Ltd.?

Solution:-

Computation of Return on equity

Particulars	Alpha	Beta
EBIT	3,60,000	3,60,000
$K_O = \frac{EBIT}{V} \times 100$	$18\% = \frac{3,60,000}{V}$	$18\% = \frac{3,60,000}{V}$
	V= 20,00,000	V= 20,00,000
Value of Debt (D)	50% = 10,00,000	20% = 4,00,000
Value of equity(S)	10,00,000	16,00,000
Interest	10,00,000 X 8%	4,00,000 X 8%
	= 80,000	=32,000
EBT = EBIT -Interest	2,80,000	3,28,000
$K_e = \frac{EBT}{value}$	$\frac{2,80,000}{10,00,000}$	$\frac{3,28,000}{16,00,000}$
	= 28%	**= 20.5%**

Because Alpha is taking more Debt =

More Financial Leverage = More Risk =Shareholders will expect more Returns

Q 4. SPC – Module 1 - Q 8

M & M (with taxes) – Levered v/s Unlevered Firm

RES Ltd. is an all equity financed company with a market value of ₹ 25,00,000 and cost of equity (K_e) 21%. The company wants to buyback equity shares worth ₹ 5,00,000 by issuing and raising 15% perpetual debt of the same amount. Rate of tax may be taken as 30%. After the capital restructuring and applying MM Model (with taxes), you are required to calculate:

i) Market value of RES Ltd.

ii) Cost of Equity (K_e)

iii) Weighted average cost of capital (using market weights)and comment on it.

Solution :-

i) Market Value of Levered Firm

= Market Value of Unlevered Firm + (Debt × Tax Rate)

= 25,00,000 + (5,00,000 X 30%)

= **26,50,000**

ii) Cost of Eq. of new Structure

= 26,50,000 – 5,00,000

= **21,50,000**

iii) Cost of Equity

$$K_e = \frac{EAT}{\text{Value of Equity}}$$

$$21\% = \frac{EAT}{25,00,000}$$

EAT = 5,25,000

PROFIT STATEMENT

To know EAT of New Structure

Particulars	Pure Equity	Debt of Equity
EBIT	7,50,000	7,50,000
(-) Interest	-	75,000
EBT	7,50,000	6,75,000
(-) TAX	2,25,000	2,02,500
EAT	**5,25,000**	**4,72,500**

Calculation of New K_e = $\frac{EAT}{Eq.\ value\ (new)}$

= $\frac{4,72,500}{21,50,000}$

= **21.97%**

Calculation of WACC

Component	₹	weight	Individual Cost	WACC
Eq.	21,50,000	0.8113	21.97%	17.82
Debt	5,00,000	0.1886	10.5%	1.9803
				19.80

Q 5. SPC – Module 1 - Q 9

Arbitrage under M&M Approach

The data relating to two companies Karna Ltd and Arjun Ltd, belonging to the same risk class, are as under –

Particulars	Karna Ltd.	Arjun Ltd.
Number of Equity Shares	90,000	1,50,000
Market price per share	₹ 1.20	₹ 1.00
6% Debentures	₹ 60,000	NIL
Profit Before Interest	₹ 18,000	₹ 18,000

There are no taxes. Bheem is an Investor holding 10% stake in Karna Ltd. What is the benefit / loss to bheem, if he switches his holding to Arjun Ltd? When will this arbitrage process end?

Solution :-

a) On the basis of given data, we understand risk of karna ltd is more since, it has debt Component. And obviously the cost of karna is less than arjun ltd. That is why, Market price of Karna Ltd. Will be Higher.

b) Since, both the companies are hawing same level of Performance, Bheem will sell the share of Karna @ ₹ 1.20 & will buy shares of Arjun @ ₹ 1.00

c) Total value of Karna = 1.20 × 90,00 = 1,08,000

Share of Bheem in Karna is 10%

Sales Value = 1,08,000 × 10% = ₹ 10,800

d) **Why Bheem will switch from Karna to Arjun ?**

Since, we are Comparing returns at the end, we Should first match the risk of Karna & Arjun Both. Thus, the investor (Bheem) has to personally barrow 6000₹ @ 6% which is Equivalent to 10% of karna's debenture i.e 60,000.

e) **Computation of amount available as surplus cash-**

Particulars	₹
Amount Received by Selling shares of Karna Ltd	10,800
(+) Personal Borrowing	6,000
Total Amount Received	16,800
(-) 10% shares of Arjun Ltd (1,50,000 X 10%)	15,000
Surplus cash Available	1,800

This, 1,800 will Motivate Bheem to sell Karna Ltd & Arjun. In short, Bheem is taking equal stake in Arjun. That too with surplus of ₹ 1,800. Provided returns of Both the Companies shall remain Same.

f) **Position of Investor before & after Switching-**

Particulars	Karna	Arjun
EBIT	18,000	18,000
(-) Interest @ 6%(60,000 X 6%)	3,600	-
EBT	14,400	18,000
% of Holding	10%	10%
Dividend Receivable	1,440	1800
(-) Interest on Borrowing (6000 X 6%)	-	360
Net Earnings	1,440	1,440

g) Then why Arjun???

Because all through returns are same i.e. ₹ 1,440 but Bheem is getting additional surplus of ₹1,800.

h) Conclusion-

As the investor is better off in switching his holding from Karna to arjun it means there will be more demand of arjun & there will be more sell of karna. So, an the supply. Since, the demand of Arjun will increase & the Price of karna will Decrease until Value of Both the Companies is Not same.

i) Then Why unnecessary people will shift from Karna to Arjun ?When MP of Both the Companies are same?

Temporary we may find NI Approach is Correct but in the Long-Run, we find MM Approach in Correct.

Q 6. **SPC – Module 1 – Q 10**

Effect of Debt funding on value of Equity Shares

Zeta Ltd is presently financed entirely by equity shares. The current Market value is ₹ 6,00,000. A Dividend of ₹ 1,20,000 has just been paid. The project would be financed by issuing ₹ 5,00,000 debentures at 18% Interest Rate. This level of dividend is expected to generate Net cash receipts of ₹ 1,05,000 per annum indefinitely. Ignoring tax consideration –

a) Calculate the value of Equity shares & the gain made by shareholders, if the cost of equity rises to 21.6%

b) Prove that the weighted Average Cost of Capital is not affected by gearing

Solution:-

a) Present K_e = $\frac{₹\ 1,20,000}{₹\ 6,00,000}$ = 20% i.e. K_o = 20%

b) **Effect of New Project**

Particulars	₹
EBIT	₹ 1,05,000
(-) Interest	₹ 90,000
Surplus available for Dividends	₹ 15,000
(+) Existing Dividend	₹ 1,20,000
Total Dividend to Equity holders	₹ 1,35,000
New Market Value of Equity = $\frac{1,35,000}{21.6\%}$	₹ 6,25,000

Existing Market Value	₹ 6,00,000
Gain to Equity Share Holders	₹ 25,000

Calculation of WACC

Component	₹	Weight	Individual Cost	WACC
Equity	6,25,000	0.55	21.6%	11.99
Debt	5,00,000	0.44	18%	7.99
				20%

Q 7. SPC – Module 1 - Q 13

Financing Decision and EPS Maximization

India limited requires ₹ 50,00,000 for a new plant. This plant is expected to yield earnings efore interest and taxes of ₹ 10,00,000. While deciding about the financial plan, the company considers the objective of maximizing Earnings per share.

It has 3 alternatives to finance the project – by raising Debt of ₹ 5,00,000 or ₹ 20,00,000 or ₹ 30,00,000 and the balance in each case, by isuuing equity shares. The company's share is currently selling at ₹ 150, but it is expected to decline to ₹ 125 in case the funds are borrowed in excess of ₹ 20,00,000. The funds can be borrowed at the rate of 9% upto ₹ 5,00,000, at 14% over ₹ 5,00,000 and upto ₹ 20,00,000 and at 19% over ₹ 20,00,000. The tax rate applicable to the company is 40%. Which form of financing should the company choose? Show EPS amount upto two decimal points.

Solution:-

We Know that ROCE = $\frac{\text{EBIT}}{\text{Capital Employed}}$

= $\frac{4,20,000}{30,00,000}$

ROCE = 14.1%

Statement Showing EPS under the different schemes

Particulars	Scheme I	Scheme II	Scheme III
Capital Employed	50,00,000	50,00,000	50,00,000
Debt	5,00,000	20,00,000	30,00,000
Equity	45,00,000	30,00,000	20,00,000
(÷)Market Value	150	150	125
Number of Equity	30,000	20,000	16,000
EBIT	10,00,000	10,00,000	10,00,000
(-) Interest	45,000	2,55,000	4,45,000
EBT	9,55,000	7,45,000	5,55,000
(-) Tax @ 40%	3,82,000	2,98,000	2,22,000
EAT	5,73,000	4,47,000	3,33,000
(÷)Number of Equity	30,000	20,000	16,000
EPS	19.1	22.35	20.8215

Scheme- II is better Option to Opt. Focus on No. of Share & Interest with slab rate.

Q 8. SPC – Module 1 - Q 17

EBT – EPS Indifference Point – Reverse working for Preference dividend rate

X Ltd. is considering the following two alternative financing plans:

Particulars	Plan – I (₹)	Plan – II (₹)
Equity shares of ₹ 10 each 12%	4,00,000	4,00,000
Debentures	2,00,000	-
Preference Shares of ₹ 100 each	-	2,00,000
	6,00,000	**6,00,000**

The indifference point between the plans is ₹ 2,40,000. Corporate tax rate is 30%. Calculate the rate of dividend on preference shares.

Solution :-

Computation of No. of Equity Shares

Particulars	Plan 1	Plan 2
EBIT	2,40,000	2,40,000
(-) interest	24,000	-
EBT	2,16,000	2,16,000
(-)Tax	64,800	72,000
EAT	1,51,200	1,68,000
(-)Preference Dividend	-	X
DI	1,51,200	1,68,000 - X
Number of Equity Share	**40,000**	**40,000**

$$\frac{1,51,200}{40,000} = \frac{1,68,000 - X}{40,000}$$

$$X = 16,800$$

$$\text{Rate of Pref. Dividend} = \frac{16,800}{2,00,000} \times 100$$

$$= 8.4\%$$

Q 9. SPC – Module 1 - Q 18

Financial BEP and EBIT – EPS Indifference Point

The management of Z Company Ltd. wants to raise its funds from market to meet out the financial demands of its long-term projects. The company has various combinations of proposals to raise its funds. You are given the following proposals of the company:

Proposal	Equity Shares (%)	Debts (%)	Preference Shares (%)
P	100	-	-
Q	50	50	-
R	50	-	50

i) Cost of debt and preference shares is 10% each.

ii) Tax rate – 50%

iii) Equity shares of the face value of ₹ 10 each will be issued at a premium of ₹ 10 per share.

iv) Total investment to be raised ₹ 40,00,000.

v) Expected earnings before interest and tax ₹ 18,00,000.

From the above proposals the management wants to take advice from you for appropriate plan after computing the following:

- Earnings per share
- Financial break-even-point

Solution :-

a) Computation Of EPS with given EBIT of ₹ 18,00,000

Particulars	P	Q	R
Equity	40,00,000	20,00,000	20,00,000
Debt	-	20,00,000	-
Preference share Capital	-	-	20,00,000
EBIT	18,00,000	18,00,000	18,00,000
(-) Interest	-	20,00,000	-
EBT	18,00,000	16,00,000	18,00,000
(-) Tax	9,00,000	8,00,000	9,00,000
EAT	9,00,000	8,00,000	9,00,000
Pref. Dividend	-	-	2,00,000
DI	9,00,000	8,00,000	7,00,000
No. of Share (Issue Price)	2,00,000	1,00,000	1,00,000
EPS	4.5	8	-

b) Computation Of Financial BEP

Particulars	P	Q	R
EBIT	0	2,00,000	4,00,000
(-) Interest	0	2,00,000	-
EBT	0	-	4,00,000
(-) TAX	0	0	2,00,000
(-) EAT	0	0	2,00,000
(-) Pref.	0	0	2,00,000
DI	0	0	0
BEP =	0	2,00,000	4,00,000

c) **Computation Of EBIT – EPS Indifference Point**

Particulars	P	Q	R
EBIT	X	X	X
(-) Interest	-	2,00,000	X
EBT	X	x-2,00,000	X
(-) Tax	0.5x	0.5x -1,00,000	0.5 x
EAT	0.5x	0.5x – 1,00,000	0.5 x
(-) Pref. Div.	-	-	2,00,000
DI	0.5 x	0.5x – 1,00,000	0.5x – 2,00,000
No. of Share	2,00,000	1,00,000	2,00,000

- Indifference of

i) P & Q - $\frac{0.5\,x}{2,00,000} = \frac{0.5x - 1,00,000}{1,00,000}$

$X = 4,00,000$

ii) Q & R - $\frac{0.5\,x - 1,00,000}{1,00,000} = \frac{0.5x - 2,00,000}{1,00,000}$

Hence, There is zero (0) no indifference point

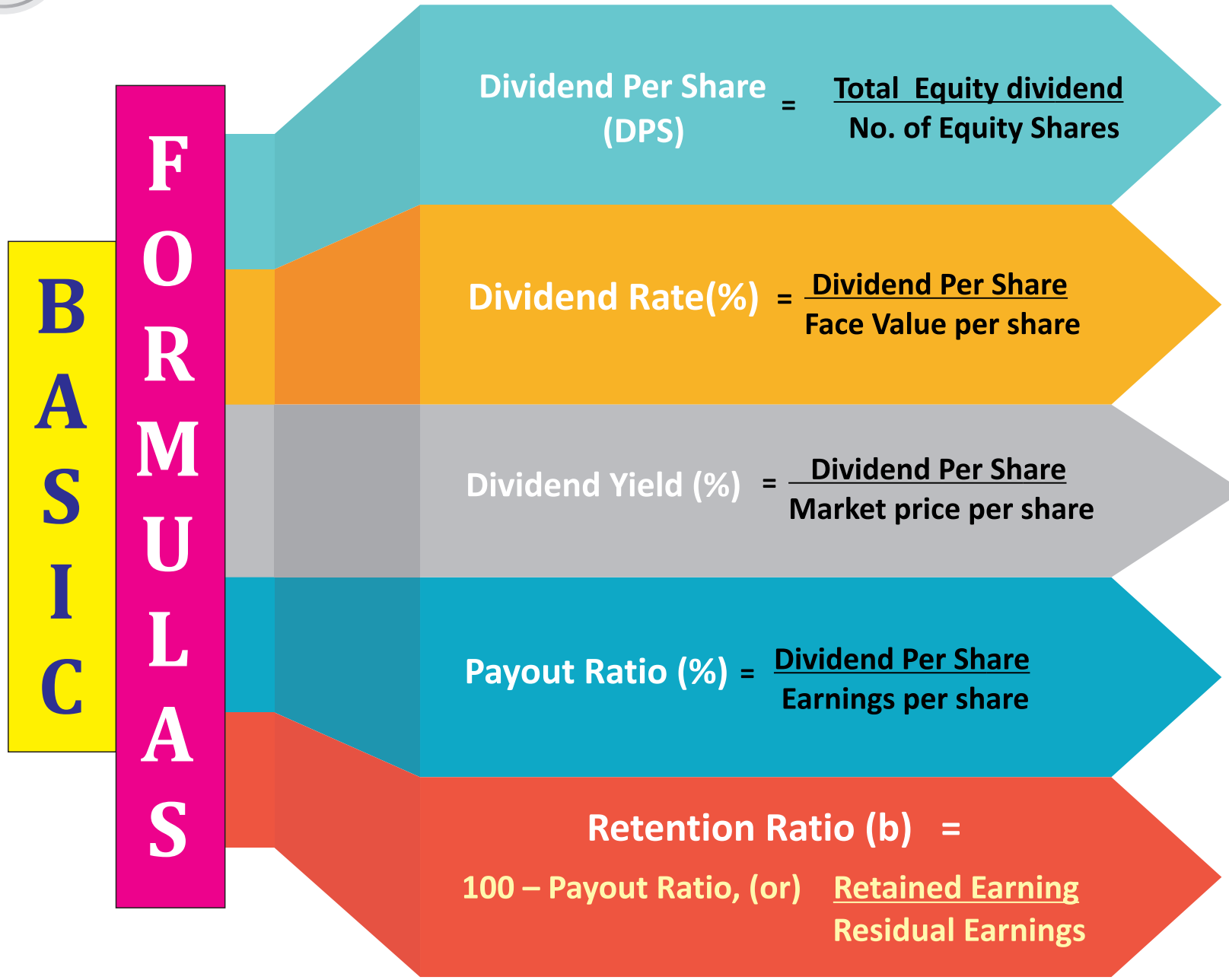
iii) P & R - $\frac{0.5\,x}{2,00,000} = \frac{0.5x - 2,00,000}{1,00,000}$

$0.25x = 0.5 - 2,00,000$

$X = 8,00,000$

Self Note:-

Ch 5 - DIVIDEND DECISION (Chart- 5.1)



Ch 5 - DIVIDEND DECISION (Chart- 5.2)

APPROACHES TO DIVIDEND POLICY

1 Water's Approach

Theoretical Market Value of Equity Share = $\dfrac{D + (E - D) \times \frac{R}{Ke}}{Ke}$

Where, D = Dividend per share
E = Earning per share
Ke = Cost of Equity Capital
R = Internal rate of Return

2 Gordon's Model

$P = \dfrac{D_1}{Ke - g}$ (with growth) $\quad P = \dfrac{D_1}{Ke}$ (without growth)

Where, P = Theoretical share Price
g = Growth Rate
D_1 = Dividend of Next Year
Ke = Cost of Equity capital

Conclusion: If R > Ke — Payout of Dividend should be Minimum
If R< Ke — Payout of Dividend should be maximum &
If R = Ke — Dividend payout can be anywhere between 0-100%

3 Modigliani & Miller's Approach (MM Hypothesis)

1) Dividend Not Paid
$P_1 = P_0(1+Ke)$

2) Dividend Paid
a] $P_1 = P_0(1+Ke) - D_1$
b] $P_0 = \dfrac{P_1 + D_1}{1+Ke}$

3) Change in No. of Shares
$\Delta n = \dfrac{I - (E - D)}{P1}$

4) Market Value of Next Year
$MV_1 = n_1 \times p_1$

Where, P_1 = Price of Next Year
P_0 = Price of Current Year
Ke = Cost of Equity
D_1 = Dividend of Next Year / Expected Dividend
I = Investment
E = Earnings / Profit of the Firm
n_1 = Existing no. of shares + New no. of shares

4 Lintner's Model

$D_1 = D_0 + [(EPS \times Target\ Payout) - D_0] \times Af$

Where, D_1 = Dividend of period 1
D_0 = Dividend of Period 0
EPS = Earning per share
Af = Adjustment Factor

5 Traditional or Graham & Dodd Model

$P = m \left[D + \dfrac{E}{3} \right]$

Where, P = Market Price
m = Multiplier
D = Dividend per share
E = Earning per share

Following are the 5 Important questions out of total 25 questions from

CH 5 – DIVIDEND DECISIONS.

Which cover all the Important Adjustments.

Q 1. SPC – Module 1 – Q 5

Walter's Model

The earnings per share of a company is ₹ 10 and the rate of capitalisation applicable to it is 10 per cent. The company has three options of paying dividend i.e.(i) 50%, (ii) 75% and (iii) 100%. Calculate the market price of the share as per Walter's model if it can earn a return of (a) 15, (b) 10 and (c) 5 per cent on its retained earnings.

Solution :-

$$P = \frac{D + \frac{r\,(E - D)}{Ke}}{Ke}$$

Where

P = Price of Share

R = Rate of Earning

Ke = Rate of Capitalisation or Cost of Equity

EPS = 10 , Ke = 10%

Particulars	1	2	3
	DP Ratio= 50%	DP Ratio =75%	DP= 100%
a) Price of share if r = 15%	$\frac{D + (E - D) \times \frac{r}{Ke}}{Ke}$	$\frac{D + (E - D) \times \frac{r}{Ke}}{Ke}$	$\frac{D + (E - D) \times \frac{r}{Ke}}{Ke}$
	$\frac{= 5 + (10 - 5) \times \frac{15}{10}}{10\%}$	$\frac{= 7.5 + (10 - 7.5) \times \frac{15}{10}}{10\%}$	$\frac{= 100 + (10 - 10) \times \frac{15}{10}}{10\%}$
	= 125	= 112.5	= 100
b) Price of share if r = 10%	$\frac{= 5 + (10 - 5) \times \frac{10}{10}}{10\%}$	$\frac{= 7.5 + (10 - 7.5) \times \frac{10}{10}}{10\%}$	$\frac{= 10 + (10 - 10) \times \frac{10}{10}}{10\%}$
	= 100	= 100	= 100
c) Price of share if r = 5%	$\frac{= 5 + (10 - 5) \times \frac{5}{10}}{10\%}$	$\frac{= 7.5 + (10 - 7.5) \times \frac{5}{10}}{10\%}$	$\frac{= 10 + (10 - 10) \times \frac{5}{10}}{10\%}$
	= 75	= 87.5	= 100

Q 2. SPC – Module 1 – Q 8

Walter's Model – Evaluation of Company's Dividend Policy

The following information is supplied to you:

Particulars	Amount (₹)
Total Earnings	2,00,000
No. of equity shares (of ₹ 100 each)	20,000
Dividend Paid	1,50,000
Price / Earning Ratio	12.5

i) Ascertain whether the company is the following an optimal dividend policy.

ii) Find out what should be the P/E ratio at which the dividend policy will have no effect on the value of the share.

iii) Will your decision change, if the P/E ratio is 8 instead of 12.5?

Solution :-

i) whether the company is the following an optimal dividend policy

a) Calculation of EPS

$$EPS = \frac{\text{Total Earnings}}{\text{No. of eq. shares}}$$

$$= \frac{2,00,000}{20,000}$$

$$= 10$$

b) Calculation of Dividend per share

$$\text{Dividend per share} = \frac{\text{Dividend paid}}{\text{No. of Shares}}$$

$$= \frac{1,50,000}{20,000}$$

$$= 7.5$$

c) Calculation Present Ke

$$Ke = \frac{1}{PE\ Ratio}$$

$$= \frac{1}{12.5}$$

$$= 8\%$$

d) Calculation of Present Return on Investment

$$r = \frac{Total\ earing}{NOS \times Face\ Value}$$

$$= \frac{2,00,000}{20,00,000} \times 100$$

$$= 10\%$$

e) Calculation of Market Price as per Walter's Formula

$$MP = \frac{D + (E - D) \times \frac{r}{Ke}}{Ke}$$

$$= \frac{7.5 + (10 - 7.5) \times \frac{10}{8}}{8\%}$$

$$= 132.81$$

r > Ke, company should not distribute dividend. Dividend should be Zero.

Since, Dividend Payout ratio of company is $\frac{1,50,000}{2,00,000} = 75\%$, it is not following the Optimal Policy.

f) Calculation of Market price when Dividend is Zero.

$$MP = \frac{D + (E - D) \times \frac{r}{Ke}}{Ke}$$

$$= 0 + \frac{(10 - 0) \times \frac{10}{8}}{8\%}$$

$$= 156.25$$

Impact an dividend when-

Ke > r	Ke < r	Ke = r
Give Maximum Dividend	r = 10%	r = 10%
↓	Ke=8%	Ke=10%
This condition has an impact on dividend.	↓	In this case the company can give the Dividend on the willing ness it want to give.
	Dividend = 0	↓
	↓	This condition has no impact on Dividend.
	This condition has an impact on dividend.	↓
		Ke= r
		r= 10%
		Ke =10%

ii) **Calculation of PE Ratio**

$$Ke = \frac{1}{PE\ Ratio}$$

$$PE\ Ratio = \frac{1}{Ke}$$

$$= \frac{1}{10\%}$$

PE Ratio = 10 times

iii) Will your decision change, if the P/E ratio is 8 instead of 12.5?

If the P/E is 8 instead of 12.5, then the ke which is the inverse of P/E ratio, would be 12.5 and in such a situation $k_e > r$ and the market price, as per Walter's model would be

$$MP = \frac{D + (E - D) \times \frac{r}{Ke}}{Ke}$$

$$= \frac{7.5 + (10 - 7.5) \times \frac{10}{12.5}}{12.5\%}$$

= ₹ 76

The optimal dividend policy for the firm would be to pay 100% dividend and market price of share in such case would be

$$Mp = \frac{10 + (10 - 10) \times \frac{10}{12.5}}{12.5\%}$$

= ₹ 80

Q 3. **SPC – Module 1 – Q 13**

Mr. A is contemplating purchase of 1,000 equity shares of a Company. His expectation of return is 10% before tax by way of dividend with an annual growth of 5%. The Company's last dividend was ₹ 2 per share. Even as he is contemplating, Mr. A suddenly finds, due to a Budget announcement Dividends have been exempted from Tax in the hands of the recipients. But the imposition of Dividend Distribution Tax on the Company is likely to lead to a fall in dividend of 20 paise per share. A's marginal tax rate is 30%.

Required:

Calculate what should be Mr. A's estimates of the price per share before and after the Budget announcement?

Solution :-

The formula for determining value of a share based on expected dividend is:

$$P_0 = \frac{D_0(1+g)}{K-g}$$

Where,

P_0 = Price (or value) per share

D_0 = Dividend per share

g = Growth rate expected in dividend

k = Expected rate of return

Particulars	Before Budget Announcement	After Budget Announcement
Growth	5%	5%
Ke	10%	7%
D_1	2 + 5% = 2%	2 – 0.2 = 1.8
		1.8 + 5% = 1.89

$P_0 = \frac{D_1}{Ke - g}$	$\frac{2.1}{10\% - 5\%}$	$\frac{1.89}{7\% - 5\%}$
	= ₹ 42	= ₹ 94.5

Q 4. SPC – Module 1 – Q 16

X Ltd. is a Shoes manufacturing company. It is all equity financed and has a paid up Capital of ₹ 10,00,000 (₹ 10 per share)

X Ltd. has hired Swastika consultants to analyse the future earnings. The report of Swastika consultants states as follows:

i) The earnings and dividend will grow at 25% for the next two years.

ii) Earnings are likely to grow at the rate of 10% from 3rd year and onwards.

iii) Further, if there is reduction in earnings growth, dividend payout ratio will increase to 50%.

The other data related to the company are as follows:

Year	EPS (₹)	Net Dividend per share (₹)	Share Price (₹)
2010	6.30	2.52	63.00
2011	7.00	2.80	46.00
2012	7.70	3.08	63.75
2013	8.40	3.36	68.75
2014	9.60	3.84	93.00

You may assume that the tax rate is 30% (not expected to change in future) and post-tax cost of capital is 15%.

By using the Dividend Valuation Model, calculate

i) Expected Market Price per share

ii) P/E Ratio.

Solution :-

It is assumed Dividend growth rate is 10%; Ke=15%

Year	EPS ₹	DPS ₹	PVF @ 15%	PV of DPS ₹
2015	12(9.6 + 25%)	4.8 (3.84 + 25%)	0.8695	4.1736
2016	15	6	0.7561	4.536
2017	16.5 (15+ 10%)	8.25 (16.5 *50%)	0.6575	5.424
				14.141

i) Calculation of [perpetual & Constant Growth] market price

$$P_0 = \frac{D_1}{Ke - g}$$

$$= \frac{8.25 + 10\%}{15\% - 10\%}$$

$$= \frac{9.075}{5\%}$$

$$= 181.5$$

This is the value of 3rd Year

PV of 181.5 which is received at the end of 3rd Year

PV of 181.5 = 181.5 × 0.6575

= 119.34

Total value = Value gained in first 3rd Year + value gained in perpetually

= 14.141 + 119.34

= 133.481

ii) Calculation of PE Ratio

$$P/E\ Ratio = \frac{MPS}{EPS}$$

$$= \frac{133.481}{9.60} = 13.90$$

Q 5. SPC – Module 1 – Q 25

M – M Approach

ABC Ltd. has 50,000 outstanding shares. The current market price per share is ₹ 100 each. It hopes to make a net income of ₹ 5,00,000 at the end of current year. The Company's Board is considering a dividend of ₹ 5 per share at the end of current financial year. The company needs to raise ₹ 10,00,000 for an approved investment expenditure. The company belongs to a risk class for which the capitalization rate is 10%. Show, how the M-M approach affects the value of firm if the dividends are paid or not paid.

Solution :-

1) Calculation of Price of Shares :-

a) When Dividend is not paid

$P_1 = P_0 (1 + ke)$

$= 100 (1 + 0.10)$

$P_1 = 110$

b) When Dividend Declared /paid

$P_1 = P_0 (1 + ke) - D_1$

$= 100 (1 + 0.10) - 5$

$= 110 - 5$

$P_1 = 105$

2) Calculation of Number of Shares :-

a) When dividend is not paid

$$\Delta n = 1 - \frac{(E - D)}{P_1}$$

$$= \frac{10,00,000 - (5,00,000 - 0)}{110}$$

$= 4545$ shares

b) When Dividend is paid

$$\Delta n = \frac{I - (E - D)}{P_1}$$

$$= \frac{10,00,000 - (5,00,000 - 2,50,000)}{105}$$

$= 7142$ shares

3) Market value of firm

a) When Dividend is not Declared

$MV_1 = n_1 \times P_1$

$= (50,000 + 4545) \times 110$

$= 59,99,950$

b) When Dividend is paid

$MV_1 = n_1 \times P_1$

$= (50,000 + 7142) \times 105$

$= 59,99,910$

Q 6. SPC – Module I – Q15

In December, 2011 AB Co.'s share was sold for ₹ 146 per share. A long term earnings growth rate of 7.5% is anticipated. AB Co. is expected to pay dividend of ₹ 3.36 per share.

i) What rate of return an investor can expect to earn assuming that dividends are expected to grow along with earnings at 7.5% per year in perpetuity?

ii) It is expected that AB Co. will earn about 10% on book Equity and shall retain 60% of earnings. In this case, whether, there would be any change in growth rate and cost of Equity?

Solution :-

i) According to Dividend Discount Model approach the firm's expected or required return on equity is computed as follows:

$$Ke = \frac{D_1}{P_0} + g$$

$$= \frac{3.36}{146} + 7.5\%$$

$$= 9.80\%$$

ii) With rate of return on retained earnings (r) 10% and retention ratio (b) 60%, new growth rate will be as follows:

$$g = b\,r$$

$$= 0.10 \times 0.60$$

$$= 0.06$$

Accordingly dividend will also get changed and to calculate this, first we shall calculate previous retention ratio (b_1) and then EPS assuming that rate of return on retained earnings (r) is same.

With previous Growth Rate of 7.5% and r =10% the retention ratio comes out to be: $0.075 = b_1 \times 0.10$

$b_1 = 0.75$ and payout ratio = 0.25

With 0.25 payout ratio the EPS will be as follows:

$$\frac{3.36}{0.25} = 13.44$$

With new 0.40 (1 – 0.60) payout ratio the new dividend will be

$D_1 = 13.44 \times 0.40 = 5.376$

Accordingly new Ke will be

$$Ke = \frac{5.376}{146} + 6\%$$

$$= 9.68\%$$

Self Note:-

Ch 6 :- Types of Financing (Chart 6.1)

Financial Needs of a Business

i) Long-term financial needs

Such needs generally refer to those requirements of funds which are for a period exceeding 5-10 yrs.

ii) Medium-term financial needs:

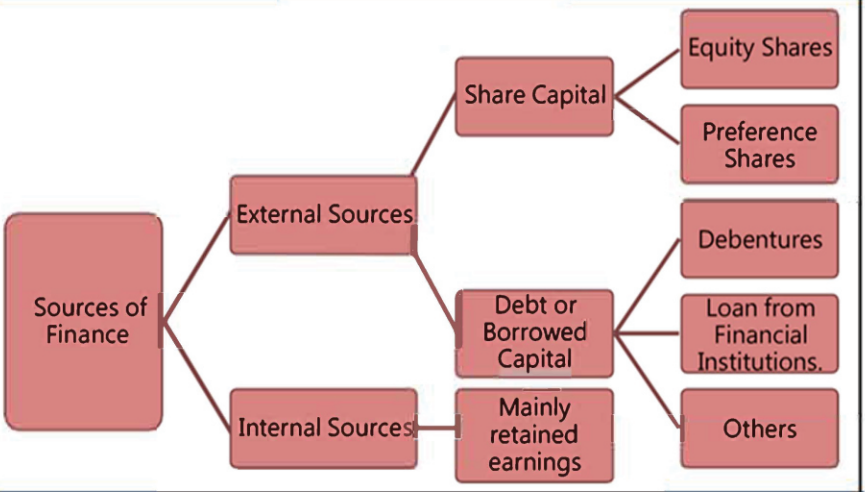
Such requirements refer to those funds which are required for a period exceeding 1 yr but not exceeding 5 yrs

iii) Short- term financial needs

Such type of financial needs arises to finance current assets such as stock, debtors, cash, etc. Investment in these assets is known as meeting of working capital requirements of concern

Classification of Financial Sources

i) Based on basic Sources



ii) Based on Maturity of repayment period

Long Term	Medium Term	Short Term
1) Share capital or Eq sh 2) Preference shares 3) Retained earnings 4) Debentures/Bonds of different types 5) Loans from FI 6) Loans from State Financial Corporations 7) Loans from commercial banks 8) Venture cap. funding 9) Asset securitization 10) International financing like Euro-issues, Foreign currency loans	1) Preference shares 2) Debentures/Bonds 3) Public deposits/ fixed deposits for duration of 3 yrs 4) Medium term loans from Commercial banks, Financial Institutions, State Financial Corporations 5) Lease financing/ Hire-Purchase financing 6) External commercial borrowings 7) Euro-issues 8) FC bonds	1) Trade credit 2) Accrued expenses and deferred income. 3) Short term loans like Working Capital Loans from Commercial banks 4) Fixed deposits for a period of 1 year or less 5) Advances received from customers. Various short-term provisions

Ch 6 :- Types of Financing (Chart 6.2)

Long Term Sources of Finance

I) Owners Capital or Equity Capital

a) Characteristics
1) Source of permanent capital
2) owners of company as they undertake highest risk
3) Eq. SH entitled to dividends. dividend payable to them is an appropriation of profits & not a charge against profits.
4) In event of winding up, ordinary shareholders can exercise their claim on assets after claims of other suppliers of capital have been met
5) There can be various types of equity shares like New issue, Rights issue, Bonus Shares, Sweat Equity

b) Advantages of raising funds by issue of equity shares
1) permanent source of finance
2) company has no liability for cash outflows associated with its redemption.
3) helps further borrowing powers of co.
4) company is not obliged legally to pay dividends
5) company can make further issue of share capital by making a right issue

c) Disadvantages of raising funds by issue of equity shares
i) cost of ordinary shares is higher
ii) Investors find ordinary shares riskier
ii) issue of new eq. shares reduces EPS & ownership and control of existing SH.

II) Preference Share Capital

a) Characteristics
1) can be raised through a public issue of shares
2) Such shares are normally cumulative
3) rate of dividend on is normally higher
4) carry a stipulation of period & funds have to be repaid at end of a stipulated period.
5) It is a hybrid form of financing which imbibes within itself some characteristics of eq. capital & some attributes of debt capital
6) Cumulative Convertible Pref. Shares may also be offered
7) It may be redeemed at a pre decided future date or at earlier stage inter alia out of profits of company

b) Various types of Preference shares	
Type of Pref. Shares	Salient Features
i) Cumulative	Arrear Dividend will accumulative
ii) Non-cumulative	No right to arrear dividend
iii) Redeemable	Redemption should be done
iv) Participating	Participate in surplus of firm
v) Non- Participating	Over fixed rate of Dividend
vi) Convertible	Option of Convert into eq. Shares

c) Advantages
i) No dilution in EPS on enlarged capital base
ii) Non-payment of pref. dividends does not force company into liquidity.
iii) No risk of takeover, as they don't have voting rights
iv) can be redeemed after a specified period.

d) Disadvantage
i) preference dividend is not tax deductible & so does not provide a tax shield to co.
ii) Preference dividends are cumulative in nature. although these dividends may be omitted, they shall need to be paid later

Ch 6 :- Types of Financing (Chart 6.3)

Long Term Sources of Finance

III) Retained Earnings

a) Long-term funds may also be provided by accumulating profits of company and by ploughing them back into business

b) Such funds belong to ordinary shareholders & increase net worth of co.

c) control of present owners is not diluted by retaining profits

d) public ltd company must plough back a reasonable amt of profit every year keeping in view legal requirements in this regard & its own expansion plans

e) Such funds entail almost no risk

IV) Debentures

a) Characteristics

1) Issued in different denominations ranging from ₹ 100 to ₹ 1,000 & carry different rates of interest.

2) Deb. are either secured or unsecured

3) May or may not be listed on stock exchange

4) cost of capital raised through debentures is quite low

5) Deb. offer a more attractive prospect than pref. shares since interest on debentures is payable whether or not company makes profits.

6) Debentures are thus instruments for raising long-term debt capital

b) Classification of Debentures on the basis of their convertibility:

1) Non-convertible debentures

2) Fully convertible debentures

3) Partly convertible debentures

c) Other types of Debentures with their features are :

1) Bearer - Transferable like negotiable instruments

2) Registered - Interest payable to registered person

3) Mortgage - Secured by a charge on Asset(s)

4) Naked or simple - Unsecured

5) Redeemable - Repaid after a certain period

6) Non-Redeemable - Not repayable

c) Advantages

1) cost of debentures is much lower than the cost of preference or equity capital

2) investors consider debenture investment safer than equity or preferred investment

3) Debenture financing does not result in dilution of control

4) period of rising prices, debenture issue is advantageous

d) Disadvantage

1) Debenture financing enhances financial risk associated with firm

2) Protective covenants associated with a debenture issue may be restrictive

Ch 6 :- Types of Financing (Chart 6.4)

Long Term Sources of Finance

V) Bonds

i) Meaning

It is fixed income security created to raise fund. Bonds can be raised through Public Issue & through Private Placement

ii) Types of Bond

a) Callable bonds

It has a call option which gives issuer right to redeem bond before maturity at a predetermined price known as call price

b) Puttable bonds

It give investor a put option back to company before maturity

iii) Foreign Bonds

a) Foreign Currency Convertible Bond

- Very low rate of interest
- Issuer can get foreign currency at a very low cost.
- Risk - It has to be redeemed on date of maturity

b) Plain Vanilla Bond

- Issuer would pay principal amount along with interest rate
- would not have any options
- can be issued in form of discounted bond or coupon bearing bond

c) Convertible Floating Rate Notes

- option for holder to convert it into longer term debt security with a specified coupon
- protects an investor against falling interest rate
- Capital gain is not applicable to FRN

d) Drop Lock Bond

- Floating Rate Note with a normal floating rate
- floating rate bond would be automatically converted into fixed rate bond if interest rate falls below a predetermined level
- new fixed rate stays till drop lock bond reaches its maturity

e) Variable Rate Demand

- normal floating rate note with a nominal maturity
- holder can sell obligation back to trustee at: At par, Plus accrued interest
- gives investor an option to

f) Yield Curve Note (YCN)

- structured debt security
- Yield increases when prevailing interest rate declines
- Yield decreases when prevailing interest rate increases
- used to hedge interest rate
- works like inverse floater

g) Yankee Bond

- denominated in dollars
- issued by non- US banks & non- US corporations
- issued in USA
- to be registered in SEC
- Time taken can be up to 14 weeks Interest rate is dollar LIBOR

h) Euro Bond

- issued or traded in a country using a currency other than one in which bond is denominated
- bond uses a certain currency, but operates outside jurisdiction of central bank that issues that currency
- issued by multinational corp

i) Samurai Bond

- Denominated in Japanese Yen
- Issued in Tokyo
- Issuer Non- Japanese Company
- Regulations : Japanese
- Purpose : Access of capital available in Japanese market
- can also be used to hedge foreign exchange risk

j) Bulldog Bond

- Denominated in Bulldog Pound Sterling/Great Britain Pound
- Issued in London
- Issuer Non- UK Company
- Regulations : Great Britain
- Purpose : Access of capital available in UK market
- can be used to fund UK operation or to fund a company's local opportunities

Ch 6 :- Types of Financing (Chart 6.5)

Bonds

iv) Indian Bonds

a) Masala Bond

- It is an Indian name used for Rupee denominated bond that Indian corporate borrowers can sell to investors in overseas markets
- issued outside India but denominated in Indian Rupees

b) Municipal Bonds

- used to finance urban infrastructure are increasingly evident in India

c) Government or Treasury Bonds

- these bonds issued by Government of India, Reserve Bank of India, any state Government or any other Government department.

Venture Capital Financing

I) Meaning

a) It refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience & funds to give shape to their ideas

b) In venture capital financing venture capitalist make investment to purchase eq. or debt securities from in-experienced entrepreneurs who undertake highly risky ventures with a potential of success

II) Characteristics

a) It is basically an equity finance in new companies

b) It can be viewed as a long term investment in growth-oriented small/medium firms

III) Methods of Venture Capital Financing

a) Equity financing

b) Conditional loan

c) Income note

d) Participating debenture

Debt Securitisation

Meaning

a) Securitisation is a process in which illiquid assets are pooled into marketable securities that can be sold to investors

b) process leads to creation of financial instruments that represent ownership interest in, or are secured by a segregated income producing asset or pool of assets

c) These assets are generally secured by personal or real property such as automobiles, real estate, or equipment loans but in some cases are unsecured

Lease Financing

Meaning

a) It is a general contract between owner & user of asset over a specified period of time.

b) asset is purchased initially by lessor (leasing company) & thereafter leased to user (lessee company) which pays a specified rent at periodical intervals

c) leasing is an alternative to purchase of an asset out of own or borrowed funds

Ch 6 :- Types of Financing (Chart 6.6)

Short Term Source of Finance

a) Trade Credit

- It represents credit granted by suppliers of goods, etc., as an incident of sale
- duration of such credit is 15 to 90 days
- it enhances automatically with increase in volume of business

b) Accrued Expenses & Deferred Income

- It represent liabilities which a co. has to pay for services which it has already received like wages, taxes, interest & dividends
- these receipts increase a company's liquidity

c) Advances from Customers

a) Manufacturers & contractors engaged in producing or constructing costly goods demand advance money from their customers at time of accepting their orders for executing their contracts or supplying goods

b) It is a cost free source of finance

d) Commercial Paper

- It is an unsecured money market instrument issued in form of a promissory note.
- issued in denominations of ₹ 5 lakhs or multiples thereof & interest rate is generally linked to yield on one-year government bond

e) Treasury Bills

- class of CG Securities.
- meet short term borrowing requirements with maturities ranging between 14 to 364 days

f) Certificates of Deposit (CD)

- It is basically a savings certificate with a fixed maturity date of not less than 15 days up to a maximum of one year

f) Bank Advances

Facilities provided by banks :-

i) Short Term Loans

It is a single advance & given against securities like shares, government securities, life insurance policies & FD receipts, etc

ii) Overdraft

Under this facility, customers are allowed to withdraw in excess of credit balance standing in their Current Account

iii) Clean Overdrafts

clean advance is granted for a short period & must not be continued for long.

Request for clean advances are entertained only from parties which are financially sound & reputed for their integrity

iv) Cash Credits

It is an arrangement under which a customer is allowed an advance up to certain limit against credit granted by bank

limits are sanctioned against security of tradable goods by way of pledge or hypothecation

v) Advances against goods

provide a reliable source of repayment.

safe & liquid

vi) Bills Purchased/Discounted

These advances are allowed against security of bills which may be clean or documentary

g) Financing of Export Trade by Banks

i) Pre-shipment finance

Types of Packing Credit

- Clean packing credit
- Packing credit against hypothecation of goods
- Packing credit against pledge of goods
- E.C.G.C. guarantee
- Forward exchange contract

ii) Post-shipment Finance

- Purchase/discounting of documentary export bills
- E.C.G.C. Guarantee
- Advance against export bills sent for collection
- Advance against duty draw backs, cash subsidy, etc

h) Inter Corporate Deposits

companies can borrow funds for a short period say 6 months from other companies which have surplus liquidity

i) Certificate of Deposit (CD)

It is a document of title similar to a time deposit receipt issued by a bank except that there is no prescribed interest rate on such funds

j) Public Deposits

A company can accept public deposits subject to stipulations of RBI from time to time maximum up to 35% of its paid up capital & reserves, from public & shareholders

accepted for a period of 6 months to 3 years

Ch 6 :- Types of Financing (Chart 6.7)

Other source of Financing

i) Seed Capital Assistance

It is designed by IDBI for professionally or technically qualified entrepreneurs &/or persons possessing relevant experience, skills & entrepreneurial traits but lack adequate financial resources

ii) Internal Cash Accruals

surplus generated from operations, after meeting all the contractual, statutory & working requirement of funds, is available for further capital expenditure

iii) Unsecured Loans

provided by promoters to meet promoters' contribution norm. These loans are subordinate to institutional loans

iv) Deferred Payment Guarantee

Many a time suppliers of machinery provide deferred credit facility under which payment for purchase of machinery can be made over a period of time

v) Capital Incentives

These incentives usually consist of a lump sum subsidy & exemption from or deferment of sales tax & octroi duty

vi) Deep Discount Bonds

It is a form of zero-interest bonds. These bonds are sold at a discounted value and on maturity face value is paid to investors

vii) Secured Premium Notes

It is issued along with a detachable warrant & is redeemable after a notified period of say 4 to 7 years

viii) Zero Interest Fully Convertible Debentures

These are fully convertible debentures which do not carry any interest

ix) Zero Coupon Bonds

It does not carry any interest but it is sold by issuing company at a discount.

x) Option Bonds

These are cumulative & non-cumulative bonds where interest is payable on maturity or periodically

xi) Inflation Bonds

Inflation Bonds are the bonds in which interest rate is adjusted for inflation

xii) Floating Rate Bonds

It is bond where interest rate is not fixed & is allowed to float depending upon market conditions

Ch 6 :- Types of Financing (Chart 6.8)

Loans from Financial Institutions	American Depository Receipts (ADRs)	Global Depository Receipts (GDRs)	Indian Depository Receipts (IDRs)
i) Financial Institution: National a) Industrial Finance Corporation of India (IFCI) b) State Financial Corporations c) Industrial Development Bank of India (IDBI) d) National Industrial Development Corporation (NIDC) e) Industrial Credit and Investment Corporation of India (ICICI) f) Life Insurance Corporation of g) Unit Trust of India (UTI) h) Industrial Reconstruction Bank of India (IRBI)	a) offered by non-US companies who want to list on any of US exchange b) represents a certain number of a company's regular shares c) issued by an approved New York bank or trust company against deposit of original shares. d) most onerous aspect of a US listing for companies is to provide full, half yearly and quarterly accounts in accordance with, or at least reconciled with US GAAPs.	a) These are negotiable certificate held in bank of one country representing a specific number of shares of a stock traded on exchange of another country b) used by companies to raise capital in either dollars or Euros c) first Indian firm to issue sponsored GDR or ADR was Reliance industries Limited	a) concept of depository receipt mechanism which is used to raise funds in foreign currency has been applied in Indian Capital Market through issue of Indian Depository Receipts b) IDRs are listed and traded in India in the same way as other Indian securities are traded.
ii) Financial Institution: a) The World Bank/ International Bank for Reconstruction & Development (IBRD) b) The International Finance Corporation (IFC) c) Asian Development Bank (ADB)			

Self Note:-

Ch 8 – Risk Analysis in Capital Budgeting (Chart 8.1)

A – Application of Various Possible Probabilities to Cash Flows

Steps

1) Multiply cash flow with the probabilities to get expected cash flows.
2) Use expected cash flows to calculate NPV or IRR.

B – Varying the discounting rate or Risk adjusted discount rate

1) A situation where actual outcome may deviate from expected outcome, risk can be measured by assigning probabilities.
2) Joint probability of two events happening together
3) Standard deviation measures how much the actual data varies from expected data

Standard deviation = (When Probability is not given)

$$S=\sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$$

Where, X is a variable
X is a mean or expected value
N is No. of years

Standard deviation = (When Probability is given)

$$S=\sqrt{\Sigma P\,(X-\bar{X})^2}$$

4) Square of Standard Deviation is called as variance.
5) Coefficient of Variance (CV) is a relative measure of deviation useful for comparison of risk of two projects, with different expected NPVs.

CV = Standard Deviation / Mean

Higher the CV, higher the relative riskiness.

C – Adjusting the Cash Flows or certainty equivalent approach (CEC)

Steps-

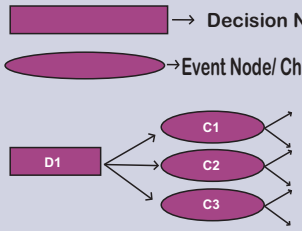
1) Risky cash flow × certainty equivalent factor to arrive at riskless cash flows
2) Riskless cash flow are then discounted at risk free rate (RF) to get the present value.
3) NPV is then calculated as

PV of cash inflows – PV of cash outflows

Certainty equivalent co-efficient = Risk less cash flow / Risky cash flow

D – Decision Tree Analysis

It is a graphical device that shows a sequence of strategic decisions & expected consequence under each possible set of circumstances.



Rule 1 – A decision tree begins with a decision point. A decision point (also known as decision node) is represented by a rectangle. An outcome point (also known as chance node) is denoted by circle.
Rule 2 – Decision alternatives (e.g. sales volume in the preceding example) are shown by a straight line originating from the decision node.
Rule 3 – A decision tree diagram is drawn from left to right. The rectangles and the circles are sequentially numbered.
Rule 4 – Values and probabilities for each branch are then incorporated.
Rule 5 – The value of each circle and each rectangle is computed by evaluating from right to left and marked.
Rule 6 – The expected value at a chance node is the aggregate of the expected values of the various branches that emanate from the chance node.
Rule 7 – The expected value at a decision node is the highest amongst the expected values of the various branches that emanate from the decision node.

E – Simulation

1)Define the problem or system intended to be simulated.
2)Formulate the model intended to be used.
3)Test the model and compare its behavior with the behavior of the actual problem environment.
4)Identify and collect the data needed to test the model.
5)Run the simulation.
6)Analyse the results of the simulation and, if desired, change the solution that is being evaluated.
7)Return the simulation to test the new solution.
8)Validate the simulation, i.e. increase the chances that any interference that may be drawn about the real situation from running the simulation will be valid.

Following are the 4 Important questions out of total 17 questions from

CH 8 – RISK ANALYSIS IN CAPITAL BUDGETING.

Which cover all the Important Adjustments.

Chapter 8

Q 1. SPC – Module 1 – Q 2

Calculation of NPV, Variance, Standard Deviation & Coefficient of variation

Possible net cash flows of Projects A and B and their probabilities are given as below. Discount rate is 10 per cent for both the project initially investment is ₹ 10,000

	Project A		Project B	
Possible Event	Cash Flow (₹)	Probability	Cash Flow (₹)	Probability
A	8,000	0.10	4,000	0.10
B	10,000	0.20	20,000	0.15
C	12,000	0.40	16,000	0.50
D	14,000	0.20	12,000	0.15
E	16,000	0.10	8,000	0.10

a)

a) Calculate the expected Net Present value for each Project.
b) Calculate Variance and Standard Deviation.
c) Calculate Coefficient of Variation.

Solution :-

1) Calculation of Expected Value for Project A and Project B

Project A :-

Possible Event	Net Cash Flow (₹)	Probability	Expected Value (₹)
A	8,000	0.10	800
B	10,000	0.20	2,000
C	12,000	0.40	4,800
D	14,000	0.20	2,800
E	16,000	0.10	1,600
ENCF ($\overline{X}$)			12,000

Project B :-

Possible Event	Net Cash Flow (₹)	Probability	Expected Value (₹)
A	4,000	0.10	400
B	20,000	0.15	3,000
C	16,000	0.50	8,000
D	12,000	0.15	1,800
E	8,000	0.10	800
ENCF ($\overline{X}$)			14,000

The net present value for Project A is (0.909 × ₹ 12,000 – ₹ 10,000) = ₹ 908

The net present value for Project B is (0.909 × ₹ 14,000 – ₹10,000) = ₹ 2726

2) Calculation of SD and Variance for Project A and Project B

Project A :-

X	$(X - \overline{X})$	$(X - \overline{X})^2$	P	$P(X - \overline{X})^2$
8,000	-4,000	1,60,00,000	0.10	16,00,000
10,000	-2,000	40,00,000	0.20	8,00,000
12,000	0	0	0.40	0
14,000	2,000	40,00,000	0.20	8,00,000
16,000	4,000	1,60,00,000	0.10	16,00,000
				48,00,000

Variance = 48,00,000

Standard Deviation = $\sqrt{Variance}$

= $\sqrt{48,00,000}$

= 2190.89

Project B :-

X	$(X - \overline{X})$	$(X - \overline{X})^2$	P	$P(X - \overline{X})^2$
4,000	10,000	10,00,00,000	0.10	1,00,00,000
20,000	6,000	3,60,00,000	0.15	54,00,000
16,000	2,000	40,00,000	0.50	20,00,000
12,000	2,000	40,00,000	0.15	6,00,000
8,000	6,000	3,60,00,000	0.10	36,00,000
				2,16,00,000

Variance = 2,16,00,000

Standard Deviation = $\sqrt{Variance}$

= $\sqrt{2,16,00,000}$

= 4647.58

3) **Calculation of Coefficient of variation for Project A and Project B**

$$\text{Coefficient of variation} = \frac{SD}{\bar{X}}$$

$$\text{Project A} = \frac{2190.89}{12,000}$$

$$= 0.1826$$

$$\text{Project A} = \frac{4647.58}{14,000}$$

$$= 0.3320$$

Q 2. SPC – Module 1 - Q 8

Calculation of NPV & Percentage change in NPV (Sensitivity Analysis)

X Ltd is considering its New Product 'with the following details

Sr. No.	Particulars	Figures
1	Initial capital cost	₹ 400 Cr
2	Annual unit sales	5 Cr
3	Selling price per unit	₹ 100
4	Variable cost per unit	₹ 50
5	Fixed costs per year	₹ 50 Cr
6	Discount Rate	6%
7	No. of years	3

a) Calculate the NPV of the project.

b) Find the impact on the project's NPV of a 2.5 per cent adverse variance in each variable. Which variable is having maximum effect.

Solution :-

	Changes In Variable	Base	Initial Cash flow Increased 410 Cr	Selling Price Reduced to 97.5	Variable Cost Per Unit increased to 51.25	Fixed cost Per unit Increased to 51.25	Units Sold Reduced to 4.875	DF @ 6.15%
a)	Selling Price Per Unit	100	100	97.5	100	100	100	100
b)	(-) Variable cost per unit	50	50	50	51.25	50	50	50
c)	Contribution	50	50	47.5	48.75	50	50	50
d)	No. Of Units Sold	5	5	5	5	5	4.875	5
e)	Total Contribution	250	250	237.5	243.75	250	243.75	250
f)	Fixed Cost Per Unit	50	50	50	50	51.25	50	50
g)	Net Cash Flow Per Yr	200	200	187.5	193.75	198.75	193.75	200
h)	Net Cash flow (2.673)	534.60	534.60	501.19	517.90	531.26	517.90	533.122
i)	Initial Cash Flow	400	410	400	400	400	400	400
j)	NPV	134.60	124.6	101.19	117.8937	131.2587	117.8937	133.122
k)	% Change in NPV	-	-7.42%	-24.82%	-12.41%	-2.48%	-12.41%	-1.09%

Conclusion – After Analyzing above data we understand changes in selling price maximum effect on NPV, whereas Discounting factor has minimum effect on NPV

Q 3. SPC – Module 2 – Q 4

Risk Adjusted Discount Rate

An enterprise is investing ₹ 100 lakhs in a project. The risk-free rate of return is 7%. Risk premium expected by the Management is 7%. The life of the project is 5 years. Following are the cash flows that are estimated over the life of the project.

Year	Cash Flow (₹ in Lakhs)
1	25
2	60
3	75
4	80
5	65

Calculate Net Present Value of the project based on Risk free rate and also on the basis of Risks adjusted discount rate.

Solution :-

1) The Present Value of the Cash Flows for all the years by discounting the cash flow at 7% is calculated as below –

Year	CF (₹ in Lakhs)	DF @ 7%	PV of Cf (₹ in Lakhs)
1	25	0.935	23.38
2	60	0.873	52.38
3	75	0.816	61.20
4	80	0.763	61.04
5	65	0.713	46.35
Total of present value of Cash flow			244.34
Less - Initial investment			(100)
Net Present Value (NPV)			144.34

2) Now when the risk-free rate is 7 % and the risk premium expected by the Management is 7 %. So the risk adjusted discount rate is 7 % + 7 % =14%. Discounting the above cash flows using the Risk Adjusted Discount Rate would be as below :

Year	CF (₹ in Lakhs)	DF @ 7%	PV of Cf (₹ in Lakhs)
1	25	0.877	21.93
2	60	0.769	46.14
3	75	0.675	50.63
4	80	0.675	47.36
5	65	0.519	33.74
Total of present value of Cash flow			199.79
Less - Initial investment			(100)
Net Present Value (NPV)			99.79

Q 4. SPC – Module 2 – Q 6

Certainty Equivalent (CE) Method for Risk Analysis

If Investment Proposal is ₹ 45,00,000 and risk free rate is 5%, calculate Net present value under certainty equivalent technique.

Year	Expected CF (₹ in Lakhs)	Certainty equivalent Coefficient
1	10,00,000	0.90
2	15,00,000	0.85
3	20,00,000	0.82
4	25,00,000	0.78

Solution :-

$$NPV = \frac{10,00,000 \times (0.90)}{(1.05)} + \frac{15,00,000 \times (0.85)}{(1.05)^2} + \frac{20,00,000 \times (0.82)}{(1.05)^3} + \frac{25,00,000 \times (0.78)}{(1.05)^4} - 45,00,000$$

$$= 8,57,142.86 + 11,56,462.59 + 14,16,724.26 + 16,04,278.07 - 45,00,000$$

$$= 5,34,607.78$$

Self Note :-

Ch 9 – Ratio Analysis (Chart 9.1)

No.	Ratio	Formula
1	Current Ratio	Current Assets / Current Liabilities
2	Quick Ratio (Also called as Liquid Ratio or Acid Test Ratio)	Quick Assets / Quick Liabilities
3	Absolute Cash Ratio or Absolute Liquidity Ratio	Cash + Marketable Securities / Current liabilities
4	Debt to Total Funds Ratio (or) Debt Ratio	Debt / Total Funds
5	Equity to total Funds Ratio (or) Equity Ratio	Equity / Total Funds
6	Debt – Equity Ratio	Debt / Equity
7	Capital Gearing Ratio	Preference capital + Debt / Equity Shareholders Funds
8	Proprietary Ratio	Proprietary Funds / Total Assets
9	Debt total Assets Ratio	Debt Funds / Total Assets
10	Fixed Asset to Long Term Fund Ratio	Fixed Assets / Long Term Funds

No.	Ratio	Formula
11	Gross Profit Ratio	Gross Profit / Sales
12	Operating Profit Ratio	Operating Profit / Sales
13	Net Profit Ratio	Net Profit / Sales
14	Contribution Sales Ratio or PV Ratio	Contribution / Sales
15	Raw Material Turnover Ratio	Cost of Raw Material Consumed / Average Stock of Raw Material
16	WIP Turnover Ratio	Factory Cost / Average Stock of WIP
17	Finished Goods or Stock Turnover Ratio	Cost of Goods Sold / Avg. Stock of Finished Goods
18	Debtors Turnover Ratio	Credit Sales / Average Accounts Receivable
19	Creditors Turnover Ratio	Credit Purchases / Average Accounts Payable
20	Working Capital Turnover Ratio (also called Operating Turnover or Cash Turnover Ratio)	Turnover / Net Working Capital
21	Fixed Assets Turnover Ratio	Turnover / Net Fixed Assets

No.	Ratio	Formula
22	Capital Turnover Ratio	Turnover / Capital Employed
23	Return on Investment (ROI) or Return on Capital Employed (ROCE)	Pre-Tax ROCE: EBIT / Equity + Debt Post-Tax ROCE: EAT + Interest / Equity + Debt
24	Return on Equity (ROE) or Return on Net Worth (RONW)	Pre - Tax ROE: EBT / Equity Post - Tax ROE: EAT / Equity
25	Return on Assets (ROA) (Note 3)	Pre - Tax ROA: EBT / Average Total Assets Post - Tax ROA: EAT / Average Total Assets
26	Earnings per share (EPS)	Residual Earnings / Number of Equity Shares
27	Dividend Per Share (DPS)	Total Equity Dividend / Number of Equity Shares
28	Dividend Payout Ratio	Dividend Per Share / Earnings per share
29	Price Earnings Ratio (PE Ratio)	Market Price Per Share / Earnings per share
30	Book Value per share	Net Worth / Number of Equity Shares

Ch 9 – Ratio Analysis (Chart 9.2)

	Term	Alternative Term	Formula for Computation
a)	**Debt**	Borrowed funds (or) Loan Funds	= Debenture + Long term loans from banks, financial Institutions, etc.
b)	**Equity**	Net worth (or) Shareholders funds (or) Proprietors funds (or) Owners funds (or) Own funds	= Equity Share Capital +Preference Share Capital + Reserves & Surplus – Miscellaneous expenditure (as per balance sheet) – Accumulated losses.
c)	**Equity Shareholders Funds**	—	= Equity as above – preference share capital, i.e. = Equity Share Capital + Reserves & Surplus - Miscellaneous expenditure (as per balance sheet) – Accumulated losses.
d)	**Total Funds**	Long Term funds (or) Capital employed (or) Investment	= Debt + Equity (i.e. a + b as above)/.. Liability Route = Fixed !ssets + Net Working Capital//.. !sset Route

Item	Computation
a) Number of days Average Stock of Raw Materials held	$\frac{365}{\text{Raw Material T/O Ratio}}$
b) Number of days Average Stock of WIP held	$\frac{365}{\text{WIP T/O Ratio}}$
c) Number of days Average stock of Finished gods held (Or) Number of days sales in inventory or Average stock velocity	$\frac{365}{\text{Finished Goods T/O Ratio}}$
d) Average collection period (of debtors) (or) Number of days sales in Receivable	$\frac{365}{\text{Debtors T/O Ratio}}$
e) Average Payment period (of Creditors) (Or) Average payment velocity	$\frac{365}{\text{Creditors T/O Ratio}}$
f) Number of days working capital held (also called Operating Cycle or Cash cycle or Working Capital Cycle)	$\frac{365}{\text{Working Capital T/O Ratio}}$

Following are the 7 Important questions out of total 24 questions from

CH 9 – FINANCIAL ANALYSIS & PLANNING – RATIO ANALYSIS.

Which cover all the Important Adjustments.

Q 1. SPC – Module 1 - Q 5

Computation of Specified Ratio

MN Limited gives you the following information related for the year ending 31st March, 2016:

Current Ratio	2.5 : 1	Current Market Price	₹ 16
Debt-Equity Ratio	1 : 1.5	per Equity Share	
Return on Total	15%	Net Working Capital	₹ 4,50,000
Assets (After Tax)		Fixed Assets	₹ 10,00,000
Total Assets	2	60,000 Equity Shares	₹ 6,00,000
Turnover Ratio		of ₹ 10 each	
Gross Profit Ratio	20%	20,000, 9% Preference	₹ 2,00,000
Stock Turnover Ratio	7	Shares of ₹10 each	
		Opening Stock	₹ 3,80,000

You are required to calculate:

a) Quick Ratio

b) Fixed Assets Turnover Ratio

c) Proprietary Ratio

d) Earnings per Share

e) Price-Earnings Ratio

Solution :-

1) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liability}}$

$$\frac{2.5}{1} = \frac{CA}{CL}$$

$$CA = 2.5\,CL$$

2) Net Working Capital = Current Assets − Current Liability

$$4,50,000 = 2.5\,CL - CL$$

$$4,50,000 = 1.5CL$$

$$CL = \frac{4,50,000}{1.5}$$

$$CL = 3,00,000$$

$$CA = 2.5CL$$

$$CA = 2.5\,(3,00,000)$$

$$CA = 7,50,000$$

3) Return on total Assents = $\frac{\text{Earnings After Tax}}{\text{Total Assents}}$

$$15\% = \frac{EAT}{7,50,000+10,00,000}$$

$$15\% = \frac{EAT}{1,75,00,000}$$

$$EAT = 17,50,000 \times 15\%$$

$$EAT = 2,62,500$$

4) Total Assets = Current Assents + Current Liability

$$= 7,50,000 + 10,00,000$$

Total Assets = 17,50,000

5) Total Assets turnover Ratio = $\frac{\text{Turnover}}{\text{Total Assets}}$

$$2 = \frac{\text{Turnover}}{17,50,000}$$

$$\text{Turnover} = 17,50,000 \times 2$$

$$\text{Turnover} = 35,00,000$$

6) GP Ratio = $\frac{\text{Gross profit}}{\text{Sales}}$

$$20\% = \frac{GP}{35,00,000}$$

$$GP = 35,00,000 \times 20\%$$

$$GP = 7,00,000$$

7) Cost OF Goods Sold = Sales – Gross Profit

$$= 35,00,000 - 7,00,000$$

$$COGS = 28,00,000$$

8) Stock Turnover Ratio = $\frac{\text{Cost Of Goods Sold}}{\text{Average Stock}}$

$$7 = \frac{28,00,000}{\text{Average Stock}}$$

$$\text{Average Stock} = \frac{28,00,000}{7}$$

$$\text{Average Stock} = 4,00,000$$

9) Average Stock = $\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$

$$4,00,000 = \frac{3,80,000 + X}{2}$$

$$8,00,000 = 3,80,000 + X$$

$$8,00,000 - 3,80,000 = X$$

Closing Stock = 4,20,000

10) Quick Ratio = $\frac{\text{Current Assets} - \text{Closing Stock}}{\text{Current Liability} - \text{Cash Credit} - \text{overdraft}}$

$$= \frac{7,50,000 - 4,20,000}{3,00,000}$$

Quick Ratio = 1.1

11) Fixed Assets turnover Ratio = $\frac{\text{Turnover}}{\text{Fixed Assets}}$

$$= \frac{35,00,000}{10,00,000}$$

Fixed Assets turnover Ratio = 3.5 times

12) Earnings Per Share = $\frac{\text{EAT} - \text{Preference Dividend}}{\text{No. of Equity Shares}}$

$$= \frac{2,62,500 - 18,000}{60,000}$$

EPS = 4.075

13) Price Earnings Ratio = $\frac{\text{Market Price Per Share}}{\text{Earnings per Share}}$

$$= \frac{16}{4.075}$$

Price Earnings Ratio = 3.92

14) **Balance Sheet**

Liability	Amount	Assets	Amount
Equity + Debt	14,50,000	Fixed Assets	10,00,000
(balancing figure)		Current Assets	7,50,000
Current Liability	3,00,000		
	17,50,000		17,50,000

Debt : Equity = 1 : 1.5

Debt = 1

Equity = $\frac{1.5}{2.5}$

Debt = 14,50,000 × $\frac{1}{2.5}$

= 580000

Equity = 14,50,000 × $\frac{1.5}{2.5}$

= 8,70,000

15) Proprietary Funds = 8,70,000

Equity = 6,00,000

Preference = 2,00,000

Reserves = 70,000

Proprietary ratio = $\frac{\text{Proprietary Funds}}{\text{Total assets}}$

= $\frac{8,70,000}{17,50,000}$

Proprietary ratio = 0.497

a) Quick Ratio = 1 : 1

b) Fixed Assets Turnover Ratio = 3.5 times

c) Proprietary Ratio = 0.497

d) Earnings per Share = 4.075

e) Price-Earnings Ratio = 3.92

Q 2. SPC – Module 1 - Q 6

Computation of Sales, Debtors, Purchases and Creditors, etc.

The following accounting information and financial ratios of M Limited relate to the year ended 31st March, 2016 :

Inventory Turnover Ratio	6 Times
Creditors Turnover Ratio	10 Times
Debtors Turnover Ratio	8 Times
Current Ratio	2.4
Gross Profit Ratio	25%

Total sales ₹ 30,00,000; cash sales 25% of credit sales; cash purchases ₹ 2,30,000; working capital ₹ 2,80,000; closing inventory is ₹ 80,000 more than opening inventory.

You are required to calculate:

a) Average Inventory

b) Purchases

c) Average Debtors

d) Average Creditors

e) Average Payment Period

f) Average Collection Period

g) Current Assets

h) Current Liabilities

Solution :-

1) Cost of Goods sold = Total Sales - Gross Profit

= 30,00,000 – 25%

= 22,50,000

2) Inventory Turnover Ratio = $\frac{\text{Cost of Goods sold}}{\text{Average Inventory}}$

$6 = \frac{22,50,000}{X}$

$X = \frac{22,50,000}{6}$

Average Inventory = 3,75,000

3) Debtors turnover Ratio = $\frac{\text{credit sales}}{\text{Average Debtors}}$

$8 = \frac{24,00,000}{X}$

$X = \frac{2,40,000}{8}$

Average Debtors = 3,00,000

Note: Credit sales = X

Cash Sales = 0.25X

Total Sales = 1.25X

30,00,000 = 1.25X

Credit Sales = $\frac{30,00,000}{1.25}$

= 24,00,000

4) Current Ratio = $\frac{\text{Current assets}}{\text{Current Liability}}$

$2.4 = \frac{CA}{CL}$

$CA = 2.4 \times CL$

Working Capital = Current assets - Current Liability

$2,80,000 = 2.4\,CL - CL$

$2,80,000 = 1.4\,CL$

$CL = \frac{2,80,000}{1.4}$

Current liability = 2,00,000

Current assets = 2.4CL

$= 2.4 \times 2,00,000$

Current assets = 4,80,000

5) Average Inventory = $\frac{\text{Opening Inventory + Closing Inventory}}{2}$

$3,75,000 = \frac{X + X + 80,000}{2}$

$7,50,000 = 2X + 80,000$

$6,70,000 = 2X$

$X = \frac{6,70,000}{2}$

Opening Inventory = 3,35,000

Closing Inventory = 3,35,000 + 80,000

= 4,15,000

6) Purchases = Sales + Closing Stock – Opening Stock – Gross profit

= 30,00,000 + 4,15,000 – 3,35,000 – 7,50,000

= 23,30,000

Trading Account

Particular	Amount	Particular	Amount
To Opening stock	3,35,000	By sales	30,00,000
To Purchases	23,30,000	By Closing stock	4,15,000
To Gross Profit	7,50,000		
	34,15,000		34,15,000

Purchases (23,30,000) = Cash = 2,30,000 & Credit = 21,00,000

7) $\text{Credit Turnover Ratio} = \frac{\text{Credit Purchases}}{\text{Average Bills Payable}}$

$10 = \frac{21,00,000}{X}$

$X = \frac{21,00,000}{10}$

Average Creditors = 2,10,000

8) $\text{Average Payment Period} = \frac{365}{\text{Credit Turnover Ratio}}$

$= \frac{365}{10}$

= 36.5 Days

9) $\text{Average Collection Period} = \frac{365}{\text{Debtors Turnover Ratio}}$

$= \frac{365}{8}$ = 45.625 days

a) Average Inventory = 3,75,000

b) Purchases = 23,30,000

c) Average Debtors = 3,00,000

d) Average Creditors = 2,10,000

e) Average Payment Period = 36.5 days

f) Average Collection Period = 45.625 days

g) Current Assets = 4,80,000

h) Current Liabilities = 2,00,000

Q 3. SPC – Module I - Q II

Statement of proprietary funds

From the following information, prepare a summarised Balance Sheet as at 31st March, 2002-

Net Working Capital	₹ 2,40,000
Bank overdraft	₹ 40,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	₹ 1,60,000
Current ratio	2.5
Liquid ratio (Quick Ratio)	1.5

Solution :-

I) $\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current liability}}$

$$2.5 = \frac{CA}{CL}$$

$$CA = 2.5\,CL$$

$$CA - CL = 2,40,000$$

$$2.5CL - CL = 2,40,000$$

$$CL = 1,60,000$$

$CA = 2.5CL$

$= 2.5\ (1,60,000)$

$CA = 4,00,000$

2) Quick Ratio = $\frac{\text{Current Assets} - \text{Stock} - \text{Prepaid expenses}}{\text{Current Liability} - \text{Overdraft} - \text{cash credit}}$

$1.5 = \frac{4,00,000 - \text{Stock}}{1,60,000 - 40,000}$

Stock = 2,20,000

3) Proprietary Ratio = $\frac{\text{Proprietary fund}}{\text{Total Assets}}$

$0.75 = \frac{\text{fixed Assets + Working Capital}}{\text{Fixed Assets + Current Assets}}$

$0.75 = \frac{\text{Fixed Assets} + 2,40,000}{\text{Fixed Assets} + 4,00,000}$

Fixed Assets = 2,40,000

4) Balance Sheet as on 31st March

Liability	Amount	Assets	Amount
Equity	4,80,000	Fixed Assets	2,40,000
(Reserve & surplus)		Current Assets:	
Current Liability:		Stock 2,20,000	
Bank Overdraft 40,000		Other Assets 1,80,000	4,00,000
Other Liability 1,20,000	1,60,000		
	6,40,000		6,40,000

Q 4. SPC – Module 1 - Q 14

Ratio Analysis – Preparation of Balance Sheet

From the following Information, prepare Balance sheet of a Firm:

Stock Turnover Ratio (based On cost of goods sold)	7 Times	Liquidity Ratio	1.25
		Net Working Capital	₹ 8,00,000
Rate of Gross Profit to Sales (All sales are on credit basis.)	25%		
		Net Worth to Fixed Assets	0.9 times
Sales to Fixed Assets	2 times	Reserves and Surplus	0.25 Times
Average Debt Collection Period	1.5 months		
		Long Term Debts	Nil
Current Ratio	2		

Chapter 9

Solution :-

1) $\text{Current Ratio} = \frac{\text{Current Assents}}{\text{Current liability}}$

$$2 = \frac{CA}{CL}$$

$$CA = 2CL$$

2) Net Working Capital = Current assets – current liability

$$8,00,000 = 2\,CL - CL$$

$$8,00,000 = CL$$

$$CL = 8,00,000$$

$$CA = 2\,CL$$

$$CA = 2\,(8,00,000)$$

$$CA = 16,00,000$$

3) Liquity Ratio = $\frac{\text{Current Assets} - \text{Stock}}{\text{Current liability}}$

$1.25 = \frac{16,00,000 - \text{Stock}}{8,00,000}$

$10,00,000 = 16,00,000 - \text{Stock}$

$\text{Stock} = 16,00,000 - 10,00,000$

Stock = 6,00,000

4) Stock Turnover Ratio = $\frac{\text{Cost Of Goods Sold}}{\text{Average Stock}}$

$7 = \frac{\text{COGS}}{6,00,000}$

$\text{COGS} = 6,00,000 \times 7$

$\text{COGS} = 42,00,000$

Assumption = It is assumed that stock is only average stack.

5) Calculation of Sales = Cost of goods Sold + Gross Profit

$= 42,00,000 + 14,00,000$

$\text{Sales} = 56,00,000$

GP to Sales = $\frac{\text{Gross Profit}}{\text{Sales}}$

$25\% = \frac{\text{Gross Profit}}{56,00,000}$

GP = 14,00,000

6) Sales to Fixed Assets = $\frac{\text{sales}}{\text{Fixed Assets}}$

$$2 = \frac{56,00,000}{\text{Fixed Assets}}$$

$$\text{Fixed Assets} = \frac{56,00,000}{2}$$

Fixed assets = 28,00,000

7) Net Worth To Fixed Assets = $\frac{\text{Net Worth}}{\text{Fixed Asset}}$

$$0.90 = \frac{\text{Net Worth}}{28,00,000}$$

Net Worth = 25,20,000

8) Average Debt collection Period = $\frac{12 \text{ Months}}{\text{Debt Turnover Ratio}}$

$$1.5 \text{ months} = \frac{12 \text{ months}}{\text{Debt Turnover Ratio}}$$

Debt Turnover Ratio = 8 Times

9) Debtors Turnover Ratio = $\frac{\text{Credit Sales}}{\text{Debtors}}$

$$8 = \frac{56,00,000}{X}$$

Debtors = 7,00,000

Balance Sheet as on 31st March

Liability	Amount	Assets	Amount
Equity	28,80,000	Fixed Assets	28,00,000
Reserves (bal fig)	7,20,000	Current Assets	
Current Liability	8,00,000	Debtors	7,00,000
		Stock	6,00,000
		Cash (bal. fig)	3,00,000
	44,00,000		44,00,000

$X + 0.25X = 36,00,000$

$1.25X = 36,00,000$

$X = \frac{36,00,000}{1.25}$

Equity = 28,80,000

Reserve = 0.25X

= 0.25(28,80,000)

= 7,20,000

Q 5. SPC – Module 1 - Q 18

Ratio Analysis – Preparation of Profit & Loss Statement

VRA has provided you the following information for the year ending 31st March-

Debt equity Ratio	2.1	Income Tax Rate	35%
14% Long Term Debt	₹ 50,00,000	Capital Turnover Ratio	1.2 Times
Gross Profit Ratio	30%	Opening Stock	₹ 4,50,000
Return on Equity	50%	Closing stock	8% of sales

You are required to prepare Trading and Profit and loss Account for the Year ending 31st March

Solution :-

1) Debt Equity Ratio = $\frac{\text{Debt}}{\text{Equity}}$

$$2 = \frac{50,00,000}{\text{Equity}}$$

$$1 \quad \text{Equity}$$

$$\text{Equity} = 50,00,000$$

$$2$$

Equity = 25,00,000

2) Total Capital Employed = Debt + Equity

= 50,00,000 + 25,00,000

= 75,00,000

3) Capital Turnover Ratio = $\frac{\text{Turnover}}{\text{Working Capital}}$

$$1.2 = \frac{X}{75,00,000}$$

Turnover = 90,00,000

4) Closing Stock = 8% of Turnover /sales

= 8% of 90,00,000

Closing Stock = 7,20,000

5) Gross Profit Ratio = $\frac{\text{Gross Profit}}{\text{Sales}}$

$$30\% = \frac{\text{Gross Profit}}{90,00,000}$$

$$GP = 90,00,000 \times 30\%$$

$$GP = 27,00,000$$

6) $$\text{Return on Equity} = \frac{\text{Earnings After Tax}}{\text{Equity}}$$

$$50\% = \frac{EAT}{25,00,000}$$

$$EAT = 12,50,000$$

7) $$\text{Earnings Before Tax} = \frac{\text{Earnings After Tax}}{(1 - T)}$$

$$= \frac{12,50,000}{65\%}$$

$$EBT = 19,23,077$$

8) Earnings Before Income and tax = Earnings Before tax + interest

$$= 19,23,077 + 7,00,000$$

$$EBIT = 26,23,077$$

Trading A/c & Profit And Loss A/c for the year ending 31st March

Particular	Amount	Particular	Amount
To opening stock	4,50,000	By Sales	90,00,000,
To Purchases	65,70,000	By Closing stock	7,20,000
To Gross Profit	27,00,000		
	97,20,000		97,20,000

To Other Exp	76,923	By Gross profit	27,00,000
(Bal. fig)		By Sales	90,00,000,
To Net profit	26,23,077	By Closing stock	7,20,000
(EBIT)			
	27,00,000		27,00,000
To Interest on	7,00,000	By EBIT	97,20,000
Debt			
To Tax	6,73,077		
To Net Profit	12,50,000		
(EAT)			
	26,23,077		26,23,077

Q 6. SPC – Module 1 - Q 20

P & L Account and Balance sheet preparation from ratios

The following accounting information and financial ratios of PQR Ltd. relate to the year ended 31st December, 2015.

Accounting Information :	
Gross Profit	15% of Sales
Net profit	8% of sales
Raw materials consumed	20% of Works Cost
Direct wages	10% of Works Cost
Stock of raw materials	3 months' usage
Stock of finished goods	6% of Works Cost
Debt collection period (All sales are on credit)	60 days

Financial Ratios :	
Fixed assets to sales	1 : 3
Fixed assets to Current assets	13 : 11
Current ratio	2 : 1
Long-term loans to Current liabilities	2 : 1
Capital to Reserves and Surplus	1 : 4

If value of fixed assets as on 31st December, 2014 amounted to ₹ 26 lakhs, prepare a Financial Statement of PQR Limited for the year ended 31st December, 2015 and also the Balance Sheet as on 31st December, 2015

Solution :-

1) Fixed assets To Sales = $\frac{\text{Fixed Assets}}{\text{Sales}}$

$$\frac{1}{3} = \frac{26,00,000}{\text{Sales}}$$

Sales = 78,00,000

2) Fixed assets to current Assets = $\frac{\text{Fixed Assets}}{\text{Current Assets}}$

$$\frac{13}{11} = \frac{26,00,000}{\text{Current Assets}}$$

Current Assets = 22,00,000

3) Current Ratio = $\frac{\text{Current assets}}{\text{Current Liability}}$

$$\frac{2}{1} = \frac{22,00,000}{\text{Current liability}}$$

Current liability = 11,00,000

4) Long Term Loan To Current Liability = $\frac{\text{Long Term Loan}}{\text{Current liability}}$

$$\frac{2}{1} = \frac{\text{Long Term Loan}}{11,00,000}$$

Long Term Loan = 22,00,000

5) Debtor Collection Period = 60 days

$$\text{Debtors} = \text{Sales} \times \frac{60}{360}$$

$$= ₹\,78,00,000 \times \frac{60}{360}$$

Debtors = ₹ 13,00,000

6) Total Assets = Fixed Assets + Current Assets

= 26,00,000 + 22,00,000

Total Assets = ₹ 48,00,000

Hence, Total Liabilities aslo ₹ 48,00,000

From Liability side of balance sheet we have,

Share Capital + Reserves & Surplus + Long term loans + Current Liabilities

= ₹ 48,00,000

Share Capital + Reserves & Surplus + ₹ 22,00,000 + ₹ 11,00,000 = ₹ 48,00,000

So, Share Capital + Reserves & Surplus = ₹ 15,00,000

Share Capital	Reserves & Surplus
1/5th = ₹ 3,00,000	4/5th = ₹ 12,00,000

7) **Cost of Goods Sold -**

It is assumed that the Opening stock of FG = Closing stock of FG = Average stock of FG

So, COGS = Works cost = sales less gross profit =

₹ 78,00,000 – 15% thereon ₹ ,70,000 = ₹ 66,30,000

8) **Raw Material consumed**

Raw Material consumed = 20% of works cost

= 20% of ₹ 66,30,000

= ₹ 13,26,000

9) **Direct Wages**

Direct Wages = 10% of works cost

= 10% of ₹ 66,30,000

= ₹ 6,63,000

10) **Closing stock of Raw material**

Closing stock of Raw material = 3 month's usage

$= ₹ 13,26,000 \times \frac{3}{12}$

= ₹ 3,31,500

11) **Closing stock of Finished goods**

Closing stock of Finished Goods = 6% of works cost

= 6% of ₹ 66,30,000

= ₹ 3,97,800

Trading and Profit & Loss Account for the year ended 31st December

Particulars	₹	Particulars	₹
To Raw Material Consumed	13,26,000	By Sales	78,00,000
To Direct Wages	6,63,000		
To Other Cost of Production	46,41,000		
To Gross Profit (15% on Sales)	11,70,000		
Total	78,00,000	Total	78,00,000
To Other Expenses (Bal. fig.)	5,46,000	By Gross profit b/d	11,70,000
To Net Profit (8% on Sales)	6,24,000		
Total	11,70,000	Total	11,70,000

Balance sheet as on 31st December

Liabilities	₹	Assets	₹
Share Capital	3,00,000	Fixed Assets	26,00,000
Reserves and Surplus	12,00,000	Current Assets	
Long Term Loans	22,00,000	Stock – RM	3,31,500
Current Liabilities	11,00,000	– FG	3,97,800
		Debtors	13,00,000
		Bank (Bal. Fig.)	1,70,700
Total	48,00,000	Total	48,00,000

Q 7. SPC – Module 1 - Q 23

Ratio Computation and Balance sheet analysis

JKL Limited has the following Balance Sheets as on March 31, 2015 and March 31, 2016:

Balance Sheet

	₹ in lakhs	
	March 31, 2015	March 31, 2016
Sources of Funds:		
Shareholders Funds	2,377	1,472
Loan Funds	3,570	3,083
	5,947	4,555
Applications of Funds:		
Fixed Assets	3,466	2,900
Cash and bank	489	470
Debtors	1,495	1,168
Stock	2,867	2,407
Other Current Assets	1,567	1,404
Less: Current Liabilities	(3,937)	(3,794)
	5,947	4,555

The Income Statement of the JKL Ltd. for the year ended is as follows:

	₹ in lakhs	
	March 31, 2015	March 31, 2015
Sales	22,165	13,882
Less: Cost of Goods sold	20,860	12,544
Gross Profit	1,305	1,338

Less:Selling, General and Administrative expenses	1,135	752
Interest Expense	113	105
Profits before Tax	57	481
Tax	23	192
Profits after Tax (PAT)	34	289

Required:

I) Calculate for the year 2015-16:

a) Inventory turnover ratio

b) Financial Leverage

c) Return on Capital Employed (ROCE)

d) Return on Equity (ROE)

e) Average Collection period.

II) Give a brief comment on the Financial Position of JKL Limited

Solution :-

1) $$\text{Average Inventory} = \frac{\text{Opening stock} + \text{Closing Stock}}{2}$$

$$= \frac{2867 + 2407}{2}$$

$$= 2637$$

a) $$\text{Inventory Turnover Ratio} = \frac{\text{Cost Of Goods Sold}}{\text{Average Inventory}}$$

$$= \frac{20,860}{2637}$$

$$= 7.91 \text{ times}$$

b) Financial Leverage = $\frac{\text{Earnings Before income and tax}}{\text{Earnings before Tax}}$

$= \frac{170}{57}$

= 2.98 times

c) Return on Capital Employed = $\frac{\text{Earnings After tax + Interest}}{\text{Equity + Debts}}$

$= \frac{34 + 113}{5251}$

= 2.79%

Note = Since , There Is No Information About Increment In Capital, Let's Take an average . i.e 5251

d) Return on Equity (ROE) = $\frac{\text{Earnings After Tax}}{\text{Equity}}$

$= \frac{34}{1924.5}$

= 1.76%

Note = since, There Is No Information About Increment In Equity ,Let's take an Average i.e. 1924.5

e) Average collection Period

Debtors Turnover Ratio = $\frac{\text{Credit Sales}}{\text{Average Debtors}}$

$= \frac{22165}{1331.5}$

= 16.646 Times

Average Collection Period = $\frac{365}{\text{Turnover Ratio}}$

$= \frac{365}{16.64}$

= 21.93 days, 22 days approx.

Understandings:-

a) Do not Ignore column of March 2015.

b) ROI / ROCE Can also be done through pre-tax

ROCE = $\frac{\text{EBIT}}{\text{Equity + Debts}}$

Do not forget to write whether it is pre-tax or post-tax

II) Comments :

a) In spite of Sales increase There Is a Drop in EBIT

b) Operating Leverage – Operating leverage is becoming adverse in spite of increased sales

c) Liquidity of the company is under gross stress

d) Rate of interest of Debts = $\frac{113}{3326.5\ (3570+3083)\div 2}$

= 3.4%

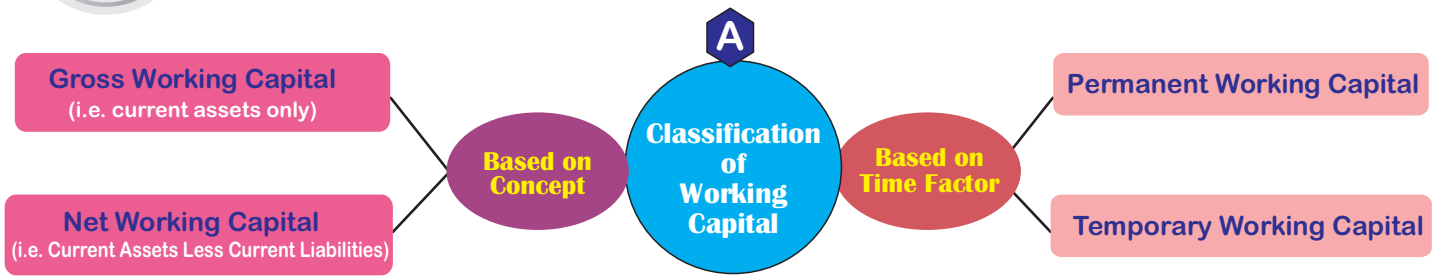
& ROCE = 2.79% which is lesser compared to rate of debt which is absolutely adverse

Advice

- Issue Equity
- Minimize Expenditure , stock

Self Note:-

Ch 10 – Working Capital Management (Chart 10.1)



B Operating Cycle

Raw Material Storage period + WIP holding period + Finished goods storage period + Debtors collection period Creditors payment Period

C Working Capital Estimation Approaches Rates of valuation of various items

Component	Total Approach	Cash Cost Approach
Raw Materials	Purchase price net of Discount	Purchase price net of Discount
Work – in Progress	Raw Materials + 50% of (Direct Labour + Direct Expenses + All production OH)	Raw Materials + 50% of (Direct Labour + Direct Expenses + Production OH excluding depreciation)
Finished Goods	Cost of Production	Cost of Production Less Depreciation
Sundry Debtors	Selling Price	Selling Price Less Profit Margin Less Depreciation
Sundry Creditors	Purchase price net of Discount	Purchase price net of Discount

Note – For WIP valuation, it is assumed that materials are fully issued and conversion (i.e. Labour and POH) is 50% complete.

D BAUMOl Model

$$\text{Optimum investment size} = \sqrt{\frac{2AT}{I}}$$

A = Annual Cash requirement

T = Transaction cost per purchase / sale of investment

I = Interest rate per rupee per annum

Note – Average Cash balance = ½ of optimum investment size (as computed above)

Associated costs of optimum investment size = Transaction costs p.a. + Interest costs p.a.

= [(No. of transactions × Cost per Transaction) + (Average Cash Balance × Interest rate p.a.)]

At the optimum investment size level, Transaction costs p.a. = Interest cost p.a. = ½ of associated costs p.a.

Ch 10 – Working Capital Management (Chart 10.2)

E Debtors Decision Making

The following cost benefit analysis procedure should be adopted

a) **Compute Gross benefit** = Contribution or profit. (Compute profit if total fixed costs are specifically given in the question, otherwise contribution may be used)

b) **Compute costs relating to debtors** = Interest on average debtors + bad debts + discount allowed + Specific costs

i) **Interest** = Cost of debtors p.a. × $\frac{\text{Collection Period}}{360}$ × Interest Rate

ii) **Bad debts** = Sales × Bad debts percentage, if any

iii) **Discount allowed** = Sales × Percentage of debtors availing discount × Percentage of discount, if any.

iv) **Specific collection** costs should be considered only if given in the question, e.g. collection costs, etc.

c) **Compute Net benefit** = Gross benefit Less Cost of Debtors = Step 1 Less Step 2.
The credit policy with the maximum Net Benefit should be selected by the firm.

F Working Capital Funding Approach

Approach	Matching Approach	Conservative Approach	Aggressive Approach
Long term funds used in	Fixed Assets & Permanent Working Capital	Fixed Assets, Permanent Working Capital & part of Temporary Working Capital	Fixed Assets & Part of Permanent Working Capital
Short term funds used in	Temporary Working Capital	Balance part of Temporary Working Capital	Balance part of Permanent Working Capital & entire Temporary Working Capital
Effect on Liquidity	Well - balanced	High Liquidity	Low Liquidity
Effect on Profitability	Comparatively Well - balanced	Low profitability & return on Assets	High return on assets but risky

Following are the 10 Important questions out of total 38 questions from

CH 10 – MANAGEMENT OF WORKING CAPITAL.

Which cover all the Important Adjustments.

Q 1. SPC – Module 1 - Q 2

Estimation of Working Capital using Operating Cycle

The Trading and Profit and Loss Account of Beta Ltd. for the year ended 31st March, 2011 is given below:

Particulars	Amt (₹)	Particulars	Amt (₹)
To Opening Stock:		By Sales (Credit)	20,00,000
Raw Materials	1,80,000	By Closing Stock:	
Work- in- progress	60,000	Raw Materials	2,00,000
Finished Goods	2,60,000	Work- in- progress	1,00,000
To Purchases (credit)	11,00,000	Finished Goods	3,00,000
To Wages	3,00,000		
To Production	2,00,000		
Expenses			
To Gross Profit c/d	5,00,000		
	26,00,000		26,00,000
To Administration	1,75,000	By Gross Profit b/f	5,00,000
Expenses			
To Selling Expenses	75,000		
To Net Profit	2,50,000		
	5,00,000		5,00,000

The opening and closing balances of debtors were ₹ 1,50,000 and ₹ 2,00,000 respectively whereas opening and closing creditors were ₹ 2,00,000 and

₹ 2,40,000 respectively.

You are required to ascertain the working capital requirement by operating cycle method.

Solution :-

Operating Cycle = Raw Material + Working Progress + finished Goods + Debtors Collection Period – Creditor's Payment Period

Raw Material Storage Period (WN 1)	64
+ WIP conversion period (WN 2)	19
+ Finished Goods Conversion Period (WN 3)	68
+ Debt Collection Period (WN 4)	32
- Creditors Payment Period (WN 5)	(73)
	110 days

WN 1 Raw Material Storage Period

a) Calculation Of Raw Material Consumed = 1,80,000 + 11,00,000 – 2,00,000

= 10,80,000

b) Average raw Material Consumed = $\frac{\text{opening raw material + closing RM}}{2}$

$= \frac{1,80,000 + 2,00,000}{2}$

= 1,90,000

c) Turnover ratio = $\frac{10,80,000}{1,90,000}$

= 5.6842 times

d) No. of Days = $\frac{360}{5.6842}$

= 64 days

WN 2 **WIP conversion period**

Calculation Of Working Capital = Raw material + OP.WIP + Prodⁿ Expenses − Closing WIP

a) Factory Cost = 10,80,000 + 3,00,000 + 2,00,000 − 1,00,000 + 60,000

= 15,40,000

b) Average WIP = $\frac{60,000 + 1,00,000}{2}$

= 80,000

c) Turnover Ratio = $\frac{15,40,000}{80,000}$

= 19.25 Times

d) No of Days = $\frac{360}{19.25}$

= 18.70 days, 19 days approx.

WN 3 **Finished Goods Conversion Period**

a) Finish Foods Stock Turnover ratio = $\frac{\text{Cost Of Production}}{\text{Average Finish Goods}}$

= $\frac{20,00,000 - 5,00,000}{2,80,000}$

= 5.36 times

b) Average of Finished Goods = $\frac{\text{opening Finished Goods + Closing Finish Goods}}{2}$

= $\frac{2,60,000 + 3,00,000}{2}$

= 2,80,000

c) No of Days = $\frac{360}{5.36}$ = 68 days

WN 4 Debt Collection Period

a) Debtors Collection Period = $\frac{\text{Credit Sales}}{\text{Avg. Debtors}}$

$= \frac{20,00,000}{1,75,000}$

$= 11.42$ times

b) No. of Days = $\frac{365}{11.42}$

= 32 days

WN 5 Creditors Payment Period

a) Creditors Collection Period = $\frac{\text{Credit Sales}}{\text{Avg. debtors}}$

$= \frac{11,00,000}{2,20,000}$

= 5 times

b) No of Days = $\frac{360}{5}$

= 73 days

Amount Required for Working Capital = $\frac{15,00,000 + 2,50,000 \times 110}{365}$

= 5,27,397

Q 2. SPC – Module 1 - Q 9

Working Capital Forecast – Differing GP rates on Local and Export Sales

PQ Limited wants to expand its business and has applied for a loan from a commercial bank for its growing financial requirements. The records of the company revels that the company sells goods in the domestic market at GP of 25% not counting depreciation as part the cost of goods sold. The following additional information is also available for you-

Particulars	₹
Sales – Home at one month's credit	₹ 1,20,00,000
Sales – Export at three month's credit (Sale price 10% below home price)	₹ 54,00,000
Material used (Suppliers extends two months credit)	₹ 45,00,000
Wages paid ½ month in arrear	₹ 36,00,000
Manufacturing Expenses (Cash) paid (one month in arrear)	₹ 54,00,000
Administration Expenses paid on month in arrear	₹ 12,00,000
Income Tax payable in four installments of which one falls in the next financial year	₹ 15,00,000

The company keeps one month's stock of each Raw Materials and finished goods and believes in keeping ₹ 10,00,000 available to it including the overdraft limit of ₹ 5,00,000 not yet utilized by the company. Assume a 15% margin for contingencies. Ignore Work-in-progress.

You are required to ascertain the requirement of the working capital of the company.

Solution :-

Particular	Computation	Amount
Current Assets		
Raw Material	45,00,000 × 1/12	3,75,000
WIP		0
Finished Goods	45L + 36L + 54L × 1/12	11,25,000
Cash In Hand	10,00,000 − 5,00,000	5,00,000
Debtors		
Domestic sales	1,20,00,000 × 1/12	10,00,000
Export	54,00,000 × 3/12	13,50,000
	Total	43,50,000
Current Liability		
Manufacturing Expenses	54,00,000 × 1/12	4,50,000
Admin Expenses	1,20,000 × 1/12	1,00,000
Wages Paid	36,00,000 × 0.5/12	1,50,000
Creditors	45,00,000 × 2/12	7,50,000
Income Tax	15,00,000/4	3,75,000
	Total	18,25,000

Net Working Capital = Current Assets – Current Liability

= 43,50,000 – 18,25,000

=25,25,000

+ Margin For Contingencies = 3,78,750

= 25,25,000 + 3,78,750

= 29,03,750

Q 3. **SPC – Module 1 - Q 13**

Preparation of Cash Budget

Great planners Ltd. Is a trading company, in respect of which you are required to prepare a cash forecast statement, together with supporting schedules, for each of the 3 months of January to march on the basis of the following information –

a) Sales department advises that sales for the current year estimated on the basis of actual sales for the previous year of ₹ 180 Lakhs, which were as follows –

January	₹ 9.00 Lakhs	February	₹ 12.60 Lakhs	March	₹ 18.00 Lakhs
April	₹ 16.20 Lakhs	May	₹ 14.40 Lakhs	June	₹ 12.00 Lakhs
July	₹ 10.50 Lakhs	August	₹ 16.50 Lakhs	September	₹ 15.00 Lakhs
October	₹ 12.00 Lakhs	November	₹ 18.00 Lakhs	December	₹ 25.80 Lakhs

b) Sundry Debtor, as at 1st January would be at ₹ 11.40 Lakhs. The pattern of sales collection is : 50% in the month of sale, 40% in the first subsequent month, 9% in the second subsequent month and 1% bad debt.

c) The company expects that it would realize by sale of machinery ₹ 1,00,000 in February, and capital expenditure during the month would amount to ₹ 2,00,000.

d) The normal expenditure, for the replacement of equipment, is estimated at ₹ 9,000 per month. The items of equipment have an average estimated life of five years.

e) Ex – gratia payment to staff will be made in January ₹ 30,000 and March ₹ 45,000.

f) It is anticipated that cash dividends of ₹ 1,20,000 will be paid in March.

g) Payment in respect of fixed and variable expenses for the first three months of January ₹ 4,81,860, February ₹ 3,56,400 and March ₹ 4,75,200.

h) The purchase cost of goods averages to 50% of selling price. The cost of the stock on hand as 31st December is ₹ 25,20,000 of which ₹ 90,000 is obsolete. It is anticipated that this latter stock will be sold in March, at 75% of the normal selling price. The company wishes to maintain stock for each month at a level of 3 subsequent months sales as determined by the sales forecast. All purchases are paid in the immediately subsequent month. The liability on this account, as at 31st December would be ₹ 6,95,000.

i) Income Tax and Provident fund payments – January ₹ 50,000, March ₹ 1,00,000.

j) As on 1st January, the company has a bank loan of ₹ 8,40,000 which, together with simple interest at the rate of 15% p.a. is payable on 31st March. The interest is due for the period January to March.

k) The cash balance on 31st December was ₹ 3,00,000.

Solution :-

WN 1 Computation of collection from Debtors

Particular	(in Lakhs)				
Sales	Nov	Dec	Jan	Feb	March
Required Pattern	18	25.80	9	12.60	18
50%	9	12.9	4.5	6.3	9
40%	-	7.2	10.32	3.6	5.04
9%	-	-	1.62	2.322	0.81
Total			16,44,000	12,22,200	14,85,000

WN 2 Calculation Of Normal Selling Price

Particular	50% of Selling Price	75% of selling price	50% of selling Price
Cost	50	90,000	90,000
Selling Price	100	180000 × 75% = 1,35,000	1,80,000 (normal selling price)

WN 3 Computation Of Closing Stock

Month	Computation	Amount
Jan	50 % (Feb +march + April)	
	= 50% (12.6 + 18 = 16.2)	23,40,000
Feb	50% (March + April + May)	
	= 50% (18 + 16.20 + 14.40)	24,30,000
March	50% (April + May + June)	
	= 50% (16.50 + 14.40 + 12)	24,30,000

Cash Budget

Particulars	Jan	Feb	March
A) Opening Balance	3,00,000	6,78,140	10,24,940
B) Receipts			
Debtors	16,44,000	12,22,200	14,85,000
Sales Of Machinery	-	1,00,000	1,35,000
Selling Of Scrap			
Total Receipts	16,44,000	13,22,200	16,20,000
C) Payments			
Capital Expenditure	-	2,00,000	-
Equipment repair exp.	9,000	9,000	9,000
Ex-Gratia Payment	30,000	-	45,000
Dividend	-	-	1,20,000
Payment For Fixed &	4,81,860	3,56,400	4,75,200
Variable Expenses			
Income Tax & PF.	50,000	50,000	1,00,000
Bank Loan	-	-	8,71,500
Purchases	6,95,000	3,60,000	7,20,000
Total Payments	12,65,860	9,25,400	23,40,700
Closing Balance (a+ b – c)	6,78,140	10,24,940	3,04,240

Q 4. SPC – Module 1 - Q 17

Preparation of Cash Budget

The following information relates to Zeta Limited, a publishing company:

The selling price of a book is ₹ 15, and sales are made on credit through a book club and invoiced on the last day of the month.

Variable costs of production per book are materials (₹ 5), labour (₹ 4), and overhead (₹ 2)

The sales manager has forecasted the following volumes:

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
No. of Books	1,000	1,000	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2300

Customers are expected to pay as follows:

One month after the sale	40%
Two months after the sale	60%

The company produces the books two months before they are sold and the creditors for materials are paid two months after production.

Variable overheads are paid in the month following production and are expected to increase by 25% in April; 75% of wages are paid in the month of production and 25% in the following month. A wage increase of 12.5% will take place on 1st March.

The company is going through a restructuring and will sell one of its freehold properties in May for ₹ 25,000, but it is also planning to buy a new printing press in May for ₹ 10,000. Depreciation is currently ₹ 1,000 per month, and will rise to ₹ 1,500 after the purchase of the new machine.

The company's corporation tax (of ₹ 10,000) is due for payment in March.

The company presently has a cash balance at bank on 31 December 2013, of ₹ 1,500.

You are required to prepare a cash budget for the six months from January to June.

Solution :-

WN 1 Calculation Of Sales & Credit Sales

Particular	Nov.	Dec.	Jan.	Feb.	March	April	May	June
Sales	15,000	15,000	15,000	18,750	22,500	30,000	28,500	33,000
After1 month (40%)		6,000	6,000	6,000	7,500	9,000	12,000	11,400
After 2 month (60%)			9,000	9,000	9,000	11,250	13,500	18,000
Total pay		6,000	15,000	15,000	16,500	20,250	25,500	29,400

WN 2 Calculation Of Payment of Overheads

Particular	Nov	Dec	Jan	Feb	March	April	May	June
Sales	1000	1000	1000	1250	1500	2000	1900	2200
Production	1000	1250	1500	2000	1900	2200	2200	
	2	2	2	2	2	2.5	2.5	
O/H	2000	2500	3000	4000	3800	5500	5500	
Payment		2000	2500	3000	4000	3800	5500	5500

WN 3 Calculation Of Payment of Wages

Particular	Dec	Jan	Feb	March	April	May	June
Sales	1000	1000	1250	1500	2000	1900	2200
Prodⁿ	1250	1500	2000	1900	2200	2200	
Rate of wages	4	4	4	4.5	4.5	4.5	
Total cost	5000	6000	8000	8550	9900	9900	10350
Payment	3750	4500	6000	6412	7425	7425	7762
	1000	1250	1500	2000	2138	2475	2475
Total	4750	5750	7500	8412	9563	9900	10237

Cash Budget

Particular	Jan	Feb	March	April	May	June
A) Opening	1,500	3,250	1,500	(11,912)	(15,024)	575
Balance						
B) Receipts						
Sales	15,000	15,000	16,500	20,250	25,500	29,400
Selling Of						
freehold Property	-	-	-	-	25,000	-
Total (B)	15,000	15,000	16,500	20,250	50,500	29,400
C) Payments						
Creditors	5,000	6,250	7,500	10,000	9,500	11,000
Overheads	2,500	3,000	4,000	3,800	5,500	5,500
Wages	5,750	7,500	8,412	9,563	9,900	10,237
Printing press	-	-	-	-	10,000	-
Income tax	-	-	10,000	-	-	-
Total (C)	13,250	16,750	29,912	23,363	34,900	26,737
Closing Balance	3,250	1,500	(11,912)	(15,025)	575	3,238
(Net)						
(A + B – C)						

Q 5. **SPC – Module 1 - Q 19**

Inventory Management Aspects

A company's annual requirement of material is 6,300 units. The ordering cost per order is ₹ 10 and the carrying cost per unit is ₹ 0.26. The following is the discount schedule applicable to the company –

Lot Size	Discount per unit (₹)
1 – 999	0
1,000 – 1,499	0.010
1,500 – 2,499	0.015
2,500 – 4,999	0.030
5,000 and above	0.050

You are required to calculate the Economic Order Quantity, considering the number of orders from 1 to 10.

Solution :-

Order (1)	Lot size (2)	Buying Cost Per Unit (No. Of Orders) x cost Per Order (3)	Carrying Cost p.a. (Avg Inventory) x carrying cost per order (4)	Associated Cost p.a. (5=3+4)	Disc. Receive p.a. For 6300 units (6)	Net Cost p.a. (7= 5-6)
1	6300	10	6300/2×0.26 = 819	829	315	514
2	3150	20	3150/2×0.26 = 409	429	189	240
3	2100	30	2100/2×0.26 = 273	303	94.5	208.5
4	1575	40	1575/2×0.26 = 204	244	94.5	149.5
5	1260	50	1260/2×0.26 = 164	214	63	151
6	1050	60	1050/2×0.26 = 136	196	63	133
7	900	70	900/2×0.26 = 117	187	0	187

8	787	80	787/2×0.26 = 102	182	0	182
9	700	90	700/2×0.26 = 91	181	0	181
10	630	100	630/2×0.26 = 82	182	0	182

Since Least cost = ₹ 133. EOQ = 1050 units. i.e. 6 orders

Q 6. SPC – Module 1 – Q 21

Credit granting Decision

A new customer has approached a firm to establish new business connection. The customer require 1.5 month of credit. If the proposal is accepted, the sales of the firm will go up by ₹ 2,40,000 per annum. The new customer is being considered as a member of 10% risk of non – payment group.

The cost of sales amounts to 80% of sales. The Tax rate is 30% and the desired rate of return is 40% (after tax).

Should the firm accept the offer? Give your opinion on the basis of calculations.

Chapter 10

Solution :-

1) Calculation of Rate of Interest

Let, rate of interest be x

Tax @ 30 % = x – 0.30x

Rate of interest after tax = 40%

0.70X = 40%

$$X = \frac{40\%}{0.70}$$

Rate of Interest = 57.14%

2) **Profitability of sale to new customer**

Particulars	₹
Sale Value	2,40,000
Less – Cost of sales at 80%	(1,92,000)
Less – Interest cost (1,92,000 × 57.14% × 1.5/12)	(13,714)
Net Benefit / Profit from sale to new customer	34,286

4) **Evaluation of Risk of Non payment**

		Possibility	Chance	Benefit	Expected Benefit
Options	I – Make credit sale	Payment Received	90%	₹ 34,286	₹ 30,857
		No payment received	10%	(₹ 2,05,714)	(₹ 20,571)
	II – Do not sell	No cost – No benefit			NIL

Decision – As there is a net expected benefit of (30,857 – 20,571) ₹ 10,286, the offer from new customer is acceptable.

Q 7. SPC – Module I - Q 23

Debtors Decision – Interest on Average debtors, bad debts

The current sales of raja Ltd are ₹ 250 Lakhs. It sells on terms of net 30 days and the average collection period (ACP) is 40 days. Bad debt losses are 3% of sales. The cost of funds blocked in receivables is reckoned at 18%. The variable costs are 80% of sales.

Since the company has excess capacity, it can expand its sales substantially without additional fixed costs. The management is evaluating three alternative credit policies –

1) Policy A – This calls for relaxing the credit standards. It is expected to increase sales by ₹ 40 Lakhs. On the new sales, ACP will be 50 days and the bad debt loss is 15%.

2) Policy B – This involves changing the terms of credit from net 30 to net 45. This is expected to raise sales by ₹ 15 Lakhs, lengthen the ACP to 60 days and result in a bad debt loss f 4% on the new sales.

3) Policy C – This calls for decreasing the rigours of collection effort. This is expected to push sales up by ₹ 10 Lakhs, increase the ACP to 50 days and raise the Bad Debt loss to 4%.

Determine the most optimum policy for the company. Take 1 year = 360 days.

Solution :-

(₹ In Lakhs)

Particular	Present	A	B	C
1) Sales	250	290	265	260
2) -Variable Cost @ 80%	(200)	(232)	(212)	(208)
3) Contribution	50	58	53	52
4) Cost of Debtors	200	232	212	208
5) Collection Period	40	40/50	60	50
6) Turnover (360/Period)	9	9/7.2	6	7.2
7) Average Debtors (cost of debtors/turnover)	22.22	26.66	35.33	28.88
8) Interest (Avg. Debtors × 18%)	4	4.79	6.35	5.19
9) Bad Debts	7.5	13.5	8.1	10.4
10) Net Benefit (3 – 8 – 9)	38.5	39.71	38.55	36.41

Conclusion =

Policy A is Best Policy As there is more Benefit Earning than Other Policies.

Hence Company Should Choose Policy A

Q 8. SPC – Module 1 - Q 29

Debtors Decision – Interest on Average debtors, bad debts, Discount allowed

A company is presently having credit sales of ₹ 12 lakh. The existing credit terms are 1/10, net 45 days and average collection period is 30 days. The current bad debts loss is 1.5%. In order to accelerate the collection process further as also to increase sales, the company is contemplating liberalization of its existing credit terms to 2/10, net 45 days. It is expected that sales are likely to increase by 1/3 of existing sales, bad debts increase to 2% of sales and average collection period to decline to 20 days. The contribution to sales ratio of the company is 22% and opportunity cost of investment in receivables is 15 percent (pre-tax). 50 per cent and 80 percent of customers in terms of sales revenue are expected to avail cash discount under existing and liberalization scheme respectively. The tax rate is 30%.

Should the company change its credit terms? (Assume 360 days in a year).

Solution :-

Particulars	Present	Proposed
1) Sales	₹ 12,00,000	16,00,000 (₹ 12L + 1/3rd)
2) Variable cost at 78% (Sales – Contribution)	₹ 9,36,000	₹ 12,48,000
3) Contribution at 22%	₹ 2,64,000	₹ 3,52,000

4) Cost of sales	₹ 9,36,000	₹ 12,48,000
5) Collection period (days)	30	30
6) Average debtor (4×5/360)	₹ 78,000	₹ 9,36,000
7) Interest on average debtors at 15%	₹ 11,700	₹ 10,400
8) Bad debts	(12L × 1.5%) ₹ 18,000	(12L × 2%) ₹ 32,000
9) Discount allowed	₹ 6,000	₹ 25,600
	(12L × 50% × 1%)	(16L × 80% × 2%)
10) Net Benefit (3-7-8-9)	₹ 2,28,300	₹ 2,84,000

Conclusion – The company may change its credit terms, due to additional net benefit of ₹ 55,700 (2,84,000 – 2,28,300)

Q 9. **SPC – Module 1 - Q 31**

Computation of average age of receivables

From the following details, calculate the average age of receivables

The company's collection pattern is as follows –

a) 10% of the sales in the same month

b) 20% of the sales in the 2nd month

c) 30% of the sales in the 3rd month

d) 40% of the sales in the 4th month

Month	Sales for the first 3 quarters of the year		
	Quarter 1	Quarter 2	Quarter 3
First	15,000	7,500	22,500
Second	15,000	15,000	15,000
Third	15,000	22,500	7,500
Total	45,000	45,000	45,000
Working days	90	90	90

Solution :-

1) **Calculation of outstanding percentage of collection**

Time of Collection	Same Month	2nd Month	3rd Month	4th Month
1) Collection %	10%	20%	30%	40%
2) Cumulative collection	10%	30%	60%	100%
3) Outstanding [100% - (2)]	90%	70%	40%	Nil

The above pattern of collection indicates that outstanding receivables at the end of each month will consist of –

a) 90% of that month's sale

b) 70% of previous month's sale

c) 40% of the sale made 2 months ago

2) **Amount of accounts receivable and the average age of receivables at the end of each quarter will be -**

Sales	Quarter 1	Quarter 2	Quarter 3
40% of 1st month sales	₹ 6,000	₹ 3,000	₹ 9,000
70% of 2nd month sales	₹ 10,500	₹ 10,500	₹ 10,500
90% of 3rd month sales	₹ 13,500	₹ 20,250	₹ 6,750
Total accounts receivable	₹ 30,000	₹ 33,750	₹ 26,250
Average age of receivable	60 days	67.5 days	52.5 days
	$\frac{30,000 \times 90}{45,000}$	$\frac{33,750 \times 90}{45,000}$	$\frac{30,000 \times 90}{45,000}$

Q 10. SPC – Module 1 – Q 34

Own financing vs. Non-recourse factoring

Ramana Ltd sells on credit terms 2/10 net 30. It has annual credit sales of ₹ 900 Lakhs, with a variable cost of 80% and bad debts of 0.75%. Past experience shows that 50% of the customers avail cash discount and the remaining customers pay 50 days after the date of sale. Presently the company's investment in receivables are financed in the ratio of 2:1 by a mix of bank borrowings and own funds, which cost 24% and 27% p.a. respectively. The company also incurs ₹ 16 Lakhs on credit collection costs.

The company is considering a "Non – Recourse Factoring" arrangement with T-factors Ltd on the following terms –

a) 15% factor reserve

b) Guaranteed payment date = 24 days after the date of purchase

c) 22% Interest / Discount

d) 4% factoring commission.

Evaluate whether the factoring proposal is worthwhile, with suitable assumptions, wherever applicable.

Solution :-

Particulars	In house	Factoring
Bad debts	6,75,000 (900L × 0.75%)	Nil
Cash Discount	9,00,000 (900L × 50% × 2%)	Nil
Factoring Charge	Nil	36,00,000 (900L × 4%)
Administration cost	16,00,000	Nil
Interest Savings	(WN 1) 15,00,00	(WN2) 13,71,120
Total Cost	46,75,000	49,71,120

Decision – Factoring is not favorable in the above case due to higher cost

WN 1 Interest cost under In-house management

a) Weighted average collection period = (50% × 10 days) + (50% × 50 days) = 30 days

b) Weighted average cost of capital for present system = (24% × 1/3rd) = 16% + 9% = 25%

c) It is assumed that 1 year = 360 days

d) Interest cost under In-house management =

$$(₹\ 900\ Lakhs \times 80\%) \times 25\% \times \frac{30}{360} = ₹\ 15,00,000$$

WN 2 Interest under Factoring

Total sales = ₹ 900 Lakhs

a) Amount lent by factor after retaining 12% Reserve i.e. 88%

(Total sales – Factoring Commission) × Advance %

= (₹ 900 Lakhs - ₹ 36 Lakhs) × 88% = ₹ 7,60,32,000

₹ 7,60,32,000 × 22% × $\frac{25}{360}$ = ₹ 11,61,600

b) Own funds (b/f)

(Total sales – amount lent by factor) × Variable cost ratio %

(9,00,00,000 – 7,60,32,000) × 80% = ₹ 1,11,74,400

₹ 1,11,74,400 × 27% × $\frac{25}{360}$ = ₹ 2,09,520

Interest under Factoring = ₹ 11,61,600 + ₹ 2,09,520 = ₹ 13,71,120

Self Note