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IDEAL ANSWERS

CA Final

(New Syllabus)

Financial Management

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(Special thanks to my student CA Varun Tibrewal for proof reading & Cross checking)
(Disclaimer: Questions asked in the exam may have wrong/inadequate information and/or ambiguous language. In that case the answers provided by institute may differ from this Ideal Answers. Though every care has been taken to make these answer error free but these answers are prepared in a short period of time & you may find some error, in that case you please mail the same.)

Question 1(a)

Tamarind intends to invest in equity shares of a company the value of which depends upon various parameters as mentioned below:

Factor	Beta	Expected Value in %	Actual Value in %
GNP	1.20	7.70	7.70
Inflation	1.75	5.50	7.00
Interest Rate	1.30	7.75	9.00
Stock Market Index	1.70	10.00	12.00
Industrial Production	1.00	7.00	7.50

If the risk free rate of interest be 9.25% how much is the return of the share under Arbitrage Pricing Theory ? (5 marks)

Solutions 1(a)

This is a question of factor valuation model and there are five factors on which expectation of investor is dependent. Following is the equation of "n" factor model:

$$E(R_p) = \lambda_0 + \lambda_1 b_{1p} + \lambda_2 b_{2p} + \dots + \lambda_n b_{np}$$

Here λ_0 is the risk free rate of return. λ_n is the risk premium for factor "n" and b_{np} is the beta of security P with respect to factor n.

Expected value:

$$E(R_p) = 9.25 + (7.70 \times 1.20) + (5.50 \times 1.75) + (7.75 \times 1.30) + (10 \times 1.70) + (7 \times 1.00) = 62.19$$

Actual Value:

$$E(R_p) = 9.25 + (7.70 \times 1.20) + (7.00 \times 1.75) + (9.00 \times 1.30) + (12 \times 1.70) + (7.50 \times 1.00) = 70.34$$

Here actual expectation is more than ideal hence the share is currently underpriced and one make an arbitrage profit of 8.15% (70.34-62.19).

Alternative method:

Arbitrage profit = $\sum (\text{Actual Value} - \text{Expected Value}) \times \text{Beta}$

$$(7-5.5) \times 1.75 + (9-7.75) \times 1.30 + (12-10) \times 1.70 + (7.5-7) \times 1 = 8.15\%$$

Question 1(b)

The current market price of an equity share of Penchant Ltd. is ₹ 420 within a period of 3 months, the maximum and minimum price of it is expected to be ₹ 500 and ₹ 400 respectively. If the risk free rate of interest be 8% p.a. what should be the value of a "3 month's" CALL option under the "Risk Neutral" method at the strike rate of ₹ 450? Given $e^{0.02} = 1.0202$ (5 marks)

Solutions 1(b)

In this question $V_s = ₹420$, $uV_s = ₹500$, $dV_s = ₹400$, $t=0.25$, $r=0.08$, $E=450$

$$\text{Now } uV_c = \max(uV_s - E, 0) = \max(500 - 450, 0) = 50$$

$$dV_c = \max(dV_s - E, 0) = \max(400 - 450, 0) = 0$$

Step 1: Option delta

$$\Delta = \frac{uV_c - dV_c}{uV_s - dV_s} = \frac{50 - 0}{500 - 400} = \frac{50}{100} = 0.5$$

Step 2: Maturity Value of perfectly hedged portfolio

$$M = uV_s \times \Delta - uV_c = 500 \times 0.5 - 50 = 200$$

$$\text{another way to calculate } M = dV_s \times \Delta = 400 \times 0.5 = 200$$

Step 3: Value of option under Risk neutral method ₹

$$V_c = V_s \times \Delta - \frac{M}{e^{rt}} = 420 \times 0.5 - \frac{200}{e^{0.08 \times 0.5}} = 210 - \frac{200}{1.0202} = 13.96$$

Question 1(c)

A Mutual fund is holding the following assets in ₹ Crore :

Investment in diversified equity shares 90.00

Cash and bank Balances 10.00

100.00

The Beta of the portfolio is 1.1. The index future is selling at 4300 level. The Fund Manager apprehends that the index will fall at the most by 10%. How many index futures he should short for perfect hedging so that the portfolio beta is reduced to 1.00? One index future consists of 50 units.

Substantiate your answer assuming the Fund Manager's apprehension will materialize.

(5 marks)

Solutions 1(c)

Note: Beta of cash is zero. Question says that beta of portfolio is 1.1 and cash is part of portfolio hence it is assumed that 1.10 is the average beta of the portfolio.

Portfolio has a long position hence to reduce risk we have to take a short position in Index future.

$$\begin{aligned} 1) \text{ Amount of Index future required} &= \text{Value of portfolio (current Beta - Desired Beta)} \\ &= 100 \text{ cr. } (1.10 - 1.00) \\ &= 10 \text{ cr.} \end{aligned}$$

$$2) \text{ Value of one index future contract} = ₹4300 \times 50 = ₹ 215000$$

$$3) \text{ No. of future contracts} = 10,00,00,000 / 215000 = 465.11 \approx 465$$

Verification of answer:

If apprehension of fund manager materialize than, Fall in Index 10% i.e 430 Points would lead to fall in value of portfolio by 11% (10*1.1), however we would profit on short position on index. Above matter can be explained as under:

Value of Portfolio (after 11% decline)	89 cr
Gain on Short position in Index (465*430*50)	<u>1 cr approx</u>
Total Value of Portfolio	90 cr

Thus fall in portfolio = fall in index i.e 10%, hence substantiating that beta of portfolio is 1.

Question 1(d)

Mr. Tempest has the following portfolio of four shares :

Name	Beta	Investment ₹ Lac.
Oxy Rin Ltd.	0.45	0.80
Boxed Ltd.	0.35	1.50
Square Ltd.	1.15	2.25
Ellipse Ltd.	1.85	4.50

The risk free rate of return is 7% and the market rate of return is 14% required.

- Determine the portfolio return.
- Calculate the portfolio Beta. **(5 marks)**

Solutions 1(d)

Portfolio Beta = Weighted average of beta of Individual securities

$$= \frac{0.45 \times 0.8 + 0.35 \times 1.5 + 1.15 \times 2.25 + 1.85 \times 4.50}{0.80 + 1.50 + 2.25 + 4.50} = \frac{11.7975}{9.05} = 1.30359$$

Portfolio Return

$$E(R_P) = R_f + (R_m - R_f)\beta = 7\% + (14 - 7) \times 1.30359 = 16.125\%$$

Question 2(a)

X Ltd. had only one water pollution control machine in this type of block of asset, with no book value under the provisions of the Income Tax Act, 1961 as it was subject to rate of depreciation of 100% in the very first year of installation.

Due to fund crunch, X Ltd. decided to sell the machine which can be sold in the market to anyone for ₹ 5,00,000 easily.

Understanding this from a reliable source. Y Ltd came forward to buy the machine for ₹ 5,00,000 and lease it to X Ltd for lease rental of ₹ 90,000 p.a. for 5 year X Ltd. decided to invest the net sale proceed in a risk free deposit, fetching yearly interest of 8.75% to generate some cash flow. It also decided to relook the entire issue afresh after the said period of 5 years.

Another company, Z Ltd. also approached X Ltd proposing to sell a similar machine for ₹ 4,00,000 to the latter and undertook to buy it back at the end of 5 year for ₹ 1,00,000 provided the maintenance were entrusted to Z Ltd. for yearly charge of ₹ 15,000. X Ltd. would utilize the net sale proceeds of the old machine to fund this machine also should it accept this offer.

The marginal rate of tax of X Ltd. is 34% and its weighted average cost of capital is 12%. Which Alternative would you recommend ? Discounting Factors @ 12%

Year	1	2	3	4	5
	0.893	0.797	0.712	0.636	0.567 (8 marks)

Solutions 2(a)**Option1: Sale & Lease back**

Step1: Initial cash flows	₹
Sale of machine to Y	+500000
Tax on Capital gain on sale of machine (5,00,000 x 34%)	-170000
Risk free deposit	-500000
Net amount	<u>-170000</u>

Step2: Annual cash flows	₹
Rent payment	-90000
Interest on deposit (500000x8.75%)	<u>+43750</u>
Net	-46250
Tax benefit (46250 x 34%)	<u>+15725</u>
Net cash flow	-30525
PVAF(12%, 5)	<u>x 3.605</u>
Present Value	-110043

Step3: Terminal cash flows	
Deposit Matured	+500000
PVF (12%, 5 th)	<u>x 0.567</u>
Present value	+283500
Step4: Net present value	= -170000-110043+283500 = +3457

Option2: Buy new machine

Step1: Initial cash flows	₹
Sale of machine in market	+500000
Tax on Capital gain on sale of machine (5,00,000 x 34%)	-170000
Buy machine from Z	<u>-400000</u>
Net amount	<u>-70000</u>

Step2: Annual cash flows	₹
Tax benefit on depreciation (400000-100000)/5 x 34%	+20400
After tax maintenance cost (15000 x 0.66)	<u>- 9900</u>
Net amount	+10500
PVAF(12%, 5)	<u>x 3.605</u>
Present Value	+37852

Step3: Terminal cash flows	₹
Salvage Value	+100000
PVF (12%, 5 th)	<u>x 0.567</u>
Present value	+56700

Step4: Net present value = -70000+37852+56700 = +24552

Conclusion: Option 2 is better. Means X Ltd. should sale existing and buy new machine from Z Ltd.

Question 2(b)

A Inc. and B Inc. intend to borrow \$200,000 and \$200,000 in ¥ respectively for a time horizon of one year. The prevalent interest rates are as follows :

Company	¥ Loan	\$ Loan
A Inc	5%	9%
B Inc.	8%	10%

The Prevalent exchange rate is \$1 = ¥ 120

They entered in a currency swap under which it is agreed that B Inc will pay A Inc @ 1% over the ¥ Loan interest rate which the later will have to pay as a result of the agreed currency swap whereas A Inc will reimburse interest to B Inc only to the extent of 9% Keeping the exchange rate invariant, quantify the opportunity gain or loss component of the ultimate outcome, resulting from the designed currency swap. **(8 marks)**

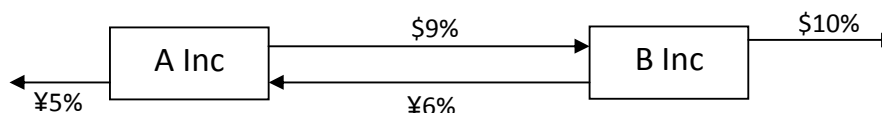
Solutions 2(b)

With Currency Swap: This is a situation of comparative advantage. Here co. A is in a better position for both ¥ and \$ loans but it has higher advantage in case of ¥ borrowings therefore it should borrow ¥ and B should borrow \$ as follows:

Company	Borrow	Pay Interest	Under Swap		Net Payment #
			Receive interest	Pay interest	
A Inc	Yen	¥ 5%	¥ 6%	\$ 9%	\$ 8%
B Inc	Dollars	\$10%	\$ 9%	¥ 6%	¥ 7%

dollar and yen rate are directly netted because exchange rate will remain constant.

This can be show with the following swap diagram also:



Without Currency Swap: If the companies fulfill their requirements without entering into swap, A Inc. will pay 9% on dollar loan and B Inc. will pay 8% in terms Yen.

Swap advantage:

Gain from currency swap = payment without swap – payment with swap

For A Inc. = 9% - 8% = 1%

In amount terms \$200000 x 1% = \$2000

For B Inc. = 8% - 7% = 1%

In amount terms \$200000 x 120 x 1% = ¥ 2,40,000

Question 3(a)

Abhiman Ltd. is a subsidiary of Janam Ltd and as acquiring Swabhiman Ltd. which is also a subsidiary of Janam Ltd. The following information is given.

	Abhiman Ltd.	Swabhiman Ltd.
% Shareholding of Promoter	50%	60%
Share Capital	₹ 200 Lacs	100 Lacs
Free Reserves and Surplus	₹ 900 Lacs	600 Lacs
Paid Up Value per share	₹ 100	10
Free float market capitalization	₹ 500 Lacs	156 Lacs
P/E Ratio (Times)	10	4

Janam Ltd. is interested in doing justice to both companies. The following parameters have been assigned by the Board of Janam Ltd., for determining the swap ratio.

Book Value	25%
Earning Per Share	50%
Market Price	25%

You are required to compute

- The Swap Ratio.
- The book value, Earning per share and expected market price of Swabhiman Ltd., (assuming P/E Ratio of Abhiman ratio remains the same and all assets and liabilities of Swabhiman Ltd are taken over at book value) **(8 marks)**

Solutions 3(a)

Particulars	Abhiman Ltd.	Swabhiman Ltd.
Paid up share capital (₹ in lakhs)	200	100
Paid up value per share (₹)	100	10
No. of shares (in lakhs)	2	10
Free float holding (100-promoters' holding)	50%	40%
Free float no. of shares (in lakhs)	1	4
$MPS = \frac{\text{free float mkt. cap.}}{\text{free float no. of share}}$	$\frac{500}{1} = \text{Rs. } 500$	$\frac{156}{4} = \text{Rs. } 39$
$EPS = \frac{\text{Market price per share}}{\text{Price earning ratio}}$	$\frac{500}{10} = \text{Rs. } 50$	$\frac{39}{4} = \text{Rs. } 9.75$
$BVPS = \frac{\text{Equity shareholders fund}}{\text{No. of shares}}$	$\frac{200 + 900}{2} = 550$	$\frac{100 + 600}{10} = 70$

(i) Swap ratio = data of target co./ data of acquiring co.

- On the basis of Book value per share (BVPS) = $70/550 = 0.1273$
- On the basis of Earning per share (EPS) = $9.75/50 = 0.1950$
- On the basis of Market value per share (MVPS) = $39/500 = 0.078$
- Average swap ratio = $0.1273 \times 25\% + 0.1950 \times 50\% + 0.078 \times 25\% = 0.1488 \approx 0.15$

(ii) Post merger BV, EPS & MPS

$$\text{Book value per share} = \frac{1100 + 700}{2 + 10 \times .15} = \frac{1800}{3.5} = \text{Rs. } 514.29$$

Earnings available to equity shareholders:

Abhiman Ltd. = ₹50 x 2 lakh shares = ₹ 100 lakhs

Swabhiman Ltd. = ₹9.75 x 10 lakh shares = ₹ 97.5 lakhs

$$\text{EPS} = \frac{100 + 97.5}{2 + (10 \times 0.15)} = \frac{197.5}{3.5} = \text{Rs. } 56.43$$

$$\text{MPS} = \text{EPS} \times \text{P/E} = \text{Rs. } 56.43 \times 10 = \text{Rs. } 564.3$$

Question 3(b)

Jumble Consultancy Group has determined relative utilities of cash flows of two forthcoming projects of its client company as follows :

Cash Flow in ₹	- 15000	-10000	-4000	0	15000	10000	5000	1000
Utilities	-100	-60	-3	0	40	30	20	10

The distribution of cash flows of project A and project B are as follows :

Project A

Cash Flow (₹)	- 15000	-10000	15000	10000	5000
Probability	0.10	0.20	0.40	0.20	0.10
Project B					
Cash Flow (₹)	-10000	-4000	15000	5000	10000
Probability	0.10	0.15	0.40	0.25	0.10

Which project should be selected and why ?

Solutions 3(b)

Project A				Project B			
Cash Flow	Utility	Prob.	Utility x Prob.	Cash Flow	Utility	Prob.	Utility x Prob.
-15000	-100	.10	-10	-10000	-60	.10	-6.00
-10000	-60	.20	-12	-4000	-3	.15	-0.45
15000	40	.40	16	15000	40	.40	16.00
10000	30	.20	6	5000	20	.25	5.00
5000	20	.10	2	10000	30	.10	3.00
			2				17.55

Decision: Project B has higher utility hence it is better than A.

Question 4(a)

Share of Voyage Ltd. are being quoted at a price earning ratio of 8 times. The Company retains 45% of its earnings which are ₹ 5 per share. You are required to compute:

- 1) The cost of equity to the company if the market expects a growth rate of 15% p.a.

- 2) If the anticipated growth rate is 16% per annum. Calculate the indicative market price with the same cost of capital.
- 3) If the company's cost of capital is 20% pa and the anticipated growth rate is 19% pa. Calculate the market price per share. **(3+3+2 marks)**

Solutions 4(a)

EPS = ₹ 5, Payout ratio=45%, P/E = 8 times, growth rate (g) = 15%

Now:

$$\text{MPS} = \text{EPS} \times \text{P/E} = 5 \times 8 = 40$$

$$\text{Retention ratio} = 100 - \text{payout ratio} = 100 - 45 = 55\%$$

$$\text{Dividend per share} = \text{EPS} \times \text{payout ratio} = 5 \times 55\% = ₹ 2.75$$

Let us assume that this is dividend for year zero. Means $D_0 = 2.75$

$$\text{Now } D_1 = D_0 (1+g) = 2.75 \times (1.15) = 3.1625$$

(1) Cost of equity:

$$K_e = \frac{D_1}{P_0} + g = \frac{3.1625}{40} + 0.15 = 22.91\%$$

(2) Market price:

$$g=0.16, \text{ hence } D_1 = 2.75 \times (1.16) = 3.19$$

$$P_0 = \frac{D_1}{K_e - g} = \frac{3.19}{0.2291 - 0.16} = \text{Rs. } 46.16$$

(3) Market price:

$$g=0.19, \text{ hence } D_1 = 2.75 \times (1.19) = 3.2725, K_e = 20\%$$

$$P_0 = \frac{D_1}{K_e - g} = \frac{3.2725}{0.20 - 0.19} = \text{Rs. } 327.25$$

Question 4(b)

An investor purchased 300 units of a Mutual Fund at ₹ 12.25 per unit on 31st December, 2009. As on 31st December, 2010 he has received ₹ 1.25 as dividend and ₹ 1.00 as capital gains distribution per unit.

Required :

- The return on the investment if the NAV as on 31st December 2010 is ₹ 13.00.
- The return on the investment as on 31st December 2010 if all dividends and capital gains distribution are reinvested into additional units of the fund at ₹ 12.50 per unit. **(8 marks)**

Solutions 4(b)

(i)

$$\text{Return} = \frac{\text{Distribution} + \text{NAV at year end}}{\text{NAV at year beginning}} - 1 = \frac{(1.25 + 1) + 13}{12.25} - 1 = \frac{15.25}{12.25} - 1 = 24.49\%$$

(ii)

No. of units at the beginning of the year	300 units
Dividend reinvestment $300 \times ₹ 2.25 / ₹ 12.5$	<u>54 units</u>
No. of units at the end of the year	354 units

$$\text{Return} = \frac{0 + 354 \times 13}{300 \times 12.25} - 1 = \frac{4602}{3675} - 1 = 25.22\%$$

Question 5(a)

Simple Ltd. and Dimple Ltd are planning to merge. The total value of the companies are dependent on the fluctuating business conditions. The following information is given for the total value (debt + equity) structure of each of the two companies.

Business Condition	Probability	Simple Ltd. ₹ Lacs	Dimple Ltd. ₹ Lacs
High Growth	0.20	820	1050
Medium Growth	0.60	550	825
Slow Growth	0.20	410	590

The current debt of Dimple Ltd is ₹ 65 Lacs and of Simple Ltd. is ₹460 Lacs Calculate the expected value of debt and equity separately for the merged entity. **(8 marks)**

Solutions 5(a)

Average Value of merged entity:

$$(820+1050) \times 0.2 + (550+825) \times 0.6 + (410+590) \times 0.2 = 1399$$

Value of debt of merged entity:

$$460+65 = 525$$

Value of equity of merged entity:

$$\text{Total value} - \text{value of debt} = 1399 - 525 = 874$$

A complicated solution expected from ICAI is as follows:

Business condition	Equity (Value – Debt)		Equity of merged entity	Probability	Equity x Probability
	Simple Ltd.	Dimple Ltd.			
High growth	360	985	1345	0.20	269
Medium growth	90	760	850	0.60	510
Slow growth	0*	525	525	0.20	105
Value of equity of merged entity					884

* Value of equity cannot be -50 hence it is taken as zero. Here we can reduce the value of debt = 460 -50 410.

Value of debt for the merged entity

Business condition	Debt		Debt of merged entity	Probability	Equity x Probability
	Simple Ltd.	Dimple Ltd.			
High growth	460	65	525	0.20	105
Medium growth	460	65	525	0.60	315
Slow growth	410*	65	475	0.20	95
Value of equity of merged entity					515

Question 5(b)

Tender Ltd. has earned a net profit of ₹ 15 Lacs after tax at 30% Interest cost charged by financial institution was ₹ 10 lacs. The invested capital is ₹ 95 Lacs of which 55% is debt. The company maintains a weighted average cost of capital of 13%. Required:

- Compute the operating income.
- Compute the Economic Value Added (EVA).
- Tender Ltd. has 6 lac equity shares outstanding. How much dividend can the company pay before the value of the entity starts declining? **(8 marks)**

Solutions 5(b)

$$\begin{aligned} \text{(a) Operating Income (EBIT)} &= \text{PAT}/(1-t) + \text{Interest amount} \\ &= ₹15 \text{ lakhs}/0.70 + ₹10 \text{ lakhs} \\ &= ₹31.43 \text{ lakhs} \end{aligned}$$

(b)

$$ROI = \frac{EBIT}{\text{Capital Invested}} = \frac{31.43}{95} = 33.08\%$$

$$\begin{aligned} \text{EVA} &= [\text{ROI} (1-t) - \text{WACC}] \text{Capital Invested} \\ &= [33.08\% \times 0.7 - 13\%] \times 95 \\ &= 9.65 \text{ lakhs} \end{aligned}$$

(c) If the company pays dividend upto the amount of EVA then its value will not decline. Hence maximum dividend per share = 9.65 lakhs / 6 lakhs = Rs.1.61

Question 6(a)

The following information is given for QB Ltd.

Earning Per Share	₹ 12
Dividend per share	₹ 3
Cost of Capital	18%
Internal Rate of Return on investment	22%
Retention Ratio	40%

Calculate the market price per share using.

- Gordons formula
- Walters Formula **(8 Marks)**

Solutions 6(a)

There are contradictory information in this question on the EPS of Rs.12 DPS is Rs.3 hence retention ratio is 75%, while in the question it is given as 40%. Solution with correct retention ratio is as follows:

(i) Value under Gordons formula:

$$\begin{aligned} \text{Growth Rate} &= \text{Return on Investment} \times \text{Retention Ratio} \\ &= 22\% \times 75\% \\ &= 16.5\% \end{aligned}$$

Let us assume that the dividend given in the question is D_1 .

$$P_0 = \frac{D_1}{K_e - g} = \frac{3}{0.18 - 0.165} = \text{Rs. } 200$$

If we assume the dividend given in the question to be D_0 then P_0 will be Rs.233.

(ii) Value under Walters formula:

$$P = \frac{DPS + \frac{IRR}{K_e} \times (EPS - DPS)}{K_e} = \frac{3 + \frac{22}{18}(12 - 3)}{18\%} = \frac{14}{18\%} = \text{Rs. } 77.77$$

Question 6(b)(i)

Mention the functions of a stock exchange. **(4 marks)**

Solutions 6(b)(i)

The Stock Exchange is a market place where investors buy and sell securities. Functions of the stock exchanges can be summarized as follows:

(a) Liquidity and Marketability of Securities: The basic function of the stock market is the creation of a continuous market for securities, enabling them to be liquidated, where investors can convert their securities into cash at any time at the prevailing market price. It also provides investors the opportunity to change their portfolio as and when they want to change, i.e. they can at any time sell one security and purchase another, thus giving them marketability.

(b) Fair Price Determination: This market is almost a perfectly competitive market as there are large number of buyers and sellers. Due to nearly perfect information, active bidding take place from both sides. This ensures the fair price to be determined by demand and supply forces.

(c) Source for Long term Funds: Corporate, Government and public bodies raise funds from the equity market. These securities are negotiable and transferable. They are traded and change hands from one investor to the other without affecting the long-term availability of funds to the issuing companies.

(d) Helps in Capital Formation: there is a nexus between the savings and the investments of the community. The savings of the community are mobilized and channeled by stock exchanges for investment into those sectors and units which are favoured by the community at large. Members of stock exchanges also assist in the flotation of new issues by acting (i) as brokers, in which capacity they, *inter alia*, try to procure subscription from investors spread all over the country, and (ii) as underwriters. This quite often results in their being required to nurse new issues till a time when the new ventures start making profits and reward their shareholders by declaring reasonable dividends when their shares command premiums in the market.

(e) Reflects the General State of Economy: The performance of the stock markets reflects the boom and depression in the economy. It indicates the general state of the economy to

all those concerned, who can take suitable steps in time. The Government takes suitable monetary and fiscal steps depending upon the state of the economy.

Question 6(b)(ii)

Mention the various techniques used in economic analysis. (4 marks)

Solutions 6(b)(ii)

Techniques Used in Economic Analysis: Economic analysis is used to forecast national income with its various components. Some of the techniques used for economic analysis are:

(a) Anticipatory Surveys: They help investors to form an opinion about the future state of the economy. It incorporates expert opinion on construction activities, expenditure on plant and machinery, levels of inventory – all having a definite bearing on economic activities. Also future spending habits of consumers are taken into account.

(b) Barometer/Indicator Approach: Various indicators are used to find out how the economy shall perform in the future. The indicators have been classified as under:

(i) *Leading Indicators:* They lead the economic activity in terms of their outcome. They relate to the time series data of the variables that reach high/low points in advance of economic activity.

(ii) *Roughly Coincidental Indicators:* They reach their peaks and troughs at approximately the same in the economy.

(iii) *Lagging Indicators:* They are time series data of variables that lag behind in their consequences vis-a- vis the economy. They reach their turning points after the economy has reached its own already.

(c) Economic Model Building Approach: In this approach, a precise and clear relationship between dependent and independent variables is determined. GNP model building or sectoral analysis is used in practice through the use of national accounting framework. The steps used are as follows:

(i) Hypothesize total economic demand by measuring total income (GNP) based on political stability, rate of inflation, changes in economic levels.

(ii) Forecasting the GNP by estimating levels of various components viz. consumption expenditure, gross private domestic investment, government purchases of goods/services, net exports.

(iii) After forecasting individual components of GNP, add them up to obtain the forecasted GNP.

(iv) Comparison is made of total GNP thus arrived at with that from an independent agency for the forecast of GNP and then the overall forecast is tested for consistency. This is carried out for ensuring that both the total forecast and the component wise forecast fit together in a reasonable manner.

Question 7

Answer any **four** from the following :

4x4=16 marks

- a) Explain the significance of LIBOR in international financial transactions.
- b) Discuss how the risk associated with securities is effected by Government policy.
- c) What is the meaning of :
 - i) Interest rate parity and
 - ii) Purchasing power parity ?
- d) What is the significance of an underlying in relation to a derivative instrument?
- e) What are the steps for simulation analysis?

Answer 7(a)

LIBOR, the London Interbank Offered Rate, is the most active interest rate market in the world. It is determined by rates that banks participating in the London money market offer each other for short-term deposits. LIBOR is used in determining the price of many other financial derivatives, including interest rate futures, swaps and Eurodollars. Due to London's importance as a global financial center, LIBOR applies not only to the Pound Sterling, but also to major currencies such as the US Dollar, Swiss Franc, Japanese Yen and Canadian Dollar.

LIBOR is determined every morning at 11:00am London time. A department of the British Bankers Association averages the inter-bank interest rates being offered by its membership. LIBOR is calculated for periods as short as overnight and as long as one year. While the rates banks offer each other vary continuously throughout the day, LIBOR is fixed for the 24 hour period. Generally, the difference between the instantaneous rate and LIBOR is very small, especially for short durations.

The most important financial derivatives related to LIBOR are Eurodollar futures. Traded at the Chicago Mercantile Exchange (CME), Eurodollars are US dollars deposited at banks outside the United States, primarily in Europe. By holding the deposits outside the country, US depositors are not subject to Federal Reserve margin requirements, allowing higher leverage of the funds. The interest rate paid on Eurodollars is largely determined by LIBOR, and Eurodollar futures provide a way of betting on or hedging against future interest rate changes.

Interest rate swaps are another significant financial derivative dependent on LIBOR. In an interest rate swap, two parties exchange sets of interest payments on a given amount of capital. Generally, one party will have a fixed interest payment, while the other will have a variable rate. The variable rate payment stream is often defined in terms of LIBOR. Interest rate swaps, and by extension LIBOR, are extremely important in providing a liquid secondary market for residential mortgages, which in turn allows lower interest rates on US mortgages.

Answer 7(b)**Effect on Risk associated with securities of change in Government policies:**

When you make investment in any security, you have to bear risk. This risk may be classified into following two parts:

- 1) Systematic Risk: Change in price of security due to market wide changes. This is unavoidable and can not be reduced by diversification.

- 2) Unsystematic Risk: Change in price of security due to company specific reasons. This is avoidable and can be reduced/eliminated by diversification.

Government policies generally affect first type of risk, i.e., systematic risk. Following are the various examples of government policies which have a bearing on security risk:

- 1) Change in exim policy
- 2) Change in indirect taxes
- 3) Change in direct taxes
- 4) Industrial policy of govt.
- 5) Change in planned & unplanned expenditure etc.
- 6) Change in Interest rates by RBI, like repo, reverse repo etc.

Answer 7(c)

(i) Interest rate parity: Interest rate parity is a theory which states that 'the size of the forward premium (or discount) should be equal to the interest rate differential between the two countries of concern'. When interest rate parity exists, covered interest arbitrage (means foreign exchange risk is covered) is not feasible, because any interest rate advantage in the foreign country will be offset by the discount on the forward rate. Thus, the act of covered interest arbitrage would generate a return that is no higher than what would be generated by a domestic investment. The Covered Interest Rate Parity equation is given by:

$$\frac{1 + r_D}{1 + r_F} = \frac{F}{S}$$

Where,

r_D = Domestic rate of interest

r_F = Foreign rate of interest

F = Forward rate of exchange (Direct quote)

S = Spot rate of exchange (Indirect quote)

The Uncovered Interest Rate Parity equation is given by:

$$\frac{1 + r_D}{1 + r_F} = \frac{S_1}{S}$$

Where,

S_1 = Expected future spot rate when the receipts denominated in foreign currency is converted into domestic currency.

(ii) Purchasing power parity: Purchasing Power Parity theory focuses on the 'inflation – exchange rate' relationship. There are two forms of PPP theory:-

- (1) The ABSOLUTE FORM, also called the 'Law of One Price' suggests that "prices of similar products of two different countries should be equal when measured in a common currency". If a discrepancy in prices as measured by a common currency exists, the demand should shift so that these prices should converge.
- (2) The RELATIVE FORM is an alternative version that accounts for the possibility of market imperfections such as transportation costs, tariffs, and quotas. It suggests that 'because of these market imperfections, prices of similar products of different countries will not necessarily be the same when measured in a common currency.' However, it states that the rate of change in the prices of products should be

somewhat similar when measured in a common currency, as long as the transportation costs and trade barriers are unchanged.

For Relative Form, Equation is given by:-

$$\frac{1 + i_D}{1 + i_F} = \frac{S_1}{S}$$

Here i represents inflation rate.

In equilibrium the rate of change in exchange equals interest rate differential. Thus, it is found that PPP is more closely approximated in the long run than in the short run.

Answer 7(d)

Derivative is a financial contract which does not have its own value. Rather its value is derived from the value of any other item (called underlying). Forwards, futures, options and swaps are the various types of derivative contracts. Following are the various types of underlying:

- 1) Stock price: Like price of Infosys, TCS, Reliance Industries etc.
- 2) Index price : Nifty, Bank Nifty, CNXIT, sensex, volatility index etc.
- 3) Commodity price: price of gold, silver, palm oil, copper, soya oil etc.
- 4) Interest rates: Libor, mibor, mibid, T-bill, PLR, interest rate on govt. bonds etc.
- 5) Weather: temperature, rainfall etc.
- 6) Currency rate: Dollar, pound, yen etc.

Spectrum of underlying is infinite, especially in over the counter derivatives market. Anything which has independent & fluctuating but measurable value can be used as an underlying in the derivatives contract.

Answer 7(e)

Steps for Simulation Analysis:

1. Modelling the project. The model shows the relationship of N.P.V. with parameters and exogenous variables. (Parameters are input variables specified by decision maker and held constant over all simulation runs. Exogenous variables are input variables, which are stochastic in nature and outside the control of the decision maker).
2. Specify values of parameters and probability distributions of exogenous variables.
3. Select a value at random from probability distribution of each of the exogenous variables.
4. Determine N.P.V. corresponding to the randomly generated value of exogenous variables and pre-specified parameter variables.
5. Repeat steps (3) & (4) a large number of times to get a large number of simulated N.P.V.s.
6. Plot frequency distribution of N.P.V.