

**FINAL COURSE**

**GROUP – I**

**REVISION TEST PAPERS**

**NOVEMBER, 2020**



**BOARD OF STUDIES**

**THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA**  
*(Set up by an Act of Parliament)*

*New Delhi*

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## REVISION TEST PAPER, NOVEMBER, 2020 – OBJECTIVE & APPROACH

*(Students are advised to go through the following paragraphs carefully to derive maximum benefit out of this RTP)*

### I Objective of Revision Test Paper

Revision Test Papers are one among the many educational inputs provided by the Board of Studies (BOS) to its students. Popularly referred to as RTP by the students, it is one of the very old publications of the BOS whose significance and relevance from the examination perspective has stood the test of time.

RTPs provide glimpses of not only the desirable ways in which examination questions are to be answered but also of the professional quality and standard of the answers expected of students in the examination. Further, aspirants can assess their level of preparation for the examination by answering various questions given in the RTP and can also update themselves with the latest developments in the various subjects relevant from the examination point of view.

The primary objectives of the RTP are:

- To help students get an insight of their preparedness for the forthcoming examination;
- To provide an opportunity for a student to find all the latest developments relevant for the forthcoming examination at one place;
- To supplement earlier studies;
- To enhance the confidence level of the students adequately; and
- To leverage the preparation of the students by giving guidance on how to approach the examinations.

RTPs contain the following:

- (i) Planning and preparing for examination
- (ii) Subject-wise guidance – An overview
- (iii) Updates applicable for a particular exam in the relevant subjects
- (iv) Topic-wise questions and detailed answers thereof in respect of each paper
- (v) Relevant publications/announcement applicable for the particular examination

Students must bear in mind that the RTP contains a variety of questions based on different sections of the syllabi and thus a comprehensive study of the entire syllabus is a pre-requisite before answering the questions of the RTP. In other words, in order to derive maximum benefit out of the RTPs, it is advised that before proceeding to solve the questions given in the RTP, students ought to have thoroughly read the Study Materials,

solved the questions given in the Practice Manual and gone through the Suggested Answers of the earlier examinations. It is important to remember that there can be large number of other complex questions which are not covered in the RTP. In fact, questions contained herein are only illustrative in nature.

The topics on which the questions are set herein have been carefully selected and meticulous attention has been paid in framing different types of questions. Detailed answers are provided to enable the students to do a self-assessment and have a focused approach for effective preparation.

Students are welcome to send their suggestions for fine tuning the RTP to the Director, Board of Studies, The Institute of Chartered Accountants of India, A-29, Sector-62, Noida 201 309 (Uttar Pradesh). RTP is also available on the Institute's website [www.icaai.org](http://www.icaai.org) under the BOS knowledge portal in students section for downloading.

## II. Planning and preparing for examination

Ideally, when you receive the RTP, you should have completed the entire syllabus of all the subjects at least once. RTP is an effective tool to revise and refresh your concepts and knowledge gained through the first round of study of the whole course. When the RTP reaches your hand, your study plan should have been completed as under:

### ❖ *Study Materials*

You must have finished reading the relevant Study Materials of all the subjects. Make sure you go through the Study Material as they cover the syllabus comprehensively.

### ❖ *Other Educational Inputs*

In case of papers on Taxation, you must have carefully perused the Supplementary Study paper containing the latest amendments made through the relevant Finance Act and notifications and circulars issued from time to time which are applicable for the forthcoming examinations.

### ❖ *Practice Manuals*

Practice Manuals are an excellent medium of understanding the practical aspects of the various provisions learnt through the Study Materials. Solving the Practice Manual at least once before proceeding to the RTP will ensure that you have a grasp of the application and computational aspect of the syllabus as well.

### ❖ *Suggested Answers*

Giving an honest attempt to solve the previous attempts suggested answers on your own, will give you a flavour of the pattern of question paper and type of questions which are being asked in the examination.

- (iii) to demonstrate effective realized price for its sale if he decides to make use of future market and after 3 months, spot price is ₹ 57 per kg and future contract price for closing the contract is ₹ 58 per kg.
8. Two companies ABC Ltd. and XYZ Ltd. approach the DEF Bank for FRA (Forward Rate Agreement). They want to borrow a sum of ₹ 100 crores after 2 years for a period of 1 year. Bank has calculated Yield Curve of both companies as follows:

Year	XYZ Ltd.	ABC Ltd.*
1	3.86	4.12
2	4.20	5.48
3	4.48	5.78

\*The difference in yield curve is due to the lower credit rating of ABC Ltd. compared to XYZ Ltd.

- (i) You are required to calculate the rate of interest DEF Bank would quote under 2V3 FRA, using the company's yield information as quoted above.
- (ii) Suppose bank offers Interest Rate Guarantee for a premium of 0.1% of the amount of loan, you are required to calculate the interest payable by XYZ Ltd. if interest rate in 2 years turns out to be
- (a) 4.50%
- (b) 5.50%

### Security Analysis and Valuation

9. Today being 1<sup>st</sup> January 2019, Ram is considering to purchase an outstanding Corporate Bond having a face value of ₹ 1,000 that was issued on 1<sup>st</sup> January 2017 which has 9.5% Annual Coupon and 20 years of original maturity (i.e. maturing on 31<sup>st</sup> December 2027). Since the bond was issued, the interest rates have been on downside and it is now selling at a premium of ₹ 125.75 per bond.

Determine the prevailing interest on the similar type of Bonds if it is held till the maturity which shall be at Par.

PV Factors:

	1	2	3	4	5	6	7	8	9
6%	0.943	0.890	0.840	0.792	0.747	0.705	0.665	0.627	0.592
8%	0.926	0.857	0.794	0.735	0.681	0.630	0.583	0.540	0.500

10. The following data is available for NNTC bond:

Face value: ₹ 1000

Coupon rate: 7.50%

Years to maturity: 8 years

Redemption Value: ₹ 1000

YTM: 8%

Calculate:

- (i) The current market price, duration and volatility of the bond.
- (ii) The expected market price if there is a decrease in required yield by 50 bps.

### Portfolio Theory

11. A study by a Mutual fund has revealed the following data in respect of three securities:

Security	$\sigma$ (%)	Correlation with Index, $P_m$
A	20	0.60
B	18	0.95
C	12	0.75

The standard deviation of market portfolio (BSE Sensex) is observed to be 15%.

- (i) What is the sensitivity of returns of each stock with respect to the market?
  - (ii) What are the covariances among the various stocks?
  - (iii) What would be the risk of portfolio consisting of all the three stocks equally?
  - (iv) What is the beta of the portfolio consisting of equal investment in each stock?
  - (v) What is the total, systematic and unsystematic risk of the portfolio in (iv) ?
12. Mr. Abhishek is interested in investing ₹ 2,00,000 for which he is considering following three alternatives:

- (i) Invest ₹ 2,00,000 in Mutual Fund X (MFX)
- (ii) Invest ₹ 2,00,000 in Mutual Fund Y (MFY)
- (iii) Invest ₹ 1,20,000 in Mutual Fund X (MFX) and ₹ 80,000 in Mutual Fund Y (MFY)

Average annual return earned by MFX and MFY is 15% and 14% respectively. Risk free rate of return is 10% and market rate of return is 12%.

Covariance of returns of MFX, MFY and market portfolio Mix are as follow:

	MFX	MFY	Mix
MFX	4.800	4.300	3.370
MFY	4.300	4.250	2.800
Mix	3.370	2.800	3.100

You are required to calculate:

- variance of return from MFX, MFY and market return,
- portfolio return, beta, portfolio variance and portfolio standard deviation,
- expected return, systematic risk and unsystematic risk; and
- Sharpe ratio, Treynor ratio and Alpha of MFX, MFY and Portfolio Mix

### Financial Services

13. AC Co. Ltd. has a turnover of ₹ 1600 Lakhs and is expecting growth of 17.90% for the next year. Average credit period is 100 days. The Bad Debt losses are about 1.50% on sales. The administrative cost for collecting receivables is ₹ 8,00,000. The AC Co. Ltd. decides to make use of Factoring Services by FS Ltd. on terms as under:

- that the factor will charge commission of 1.75%.
- 15% Risk with recourse and
- Pay an advance on receivables to AC Co. Ltd. at 14% p.a. interest after withholding 10% as reserve.

You are required to calculate the effective cost of factoring to AC Co. Ltd. for the year.

Show amount in Lakhs of ₹ with two decimal points. Assume 360 days in a year.

### Mutual Fund

14. There are two Mutual Funds viz. D Mutual Fund Ltd. and K Mutual Fund Ltd. Each having close ended equity schemes.

NAV as on 31-12-2019 of equity schemes of D Mutual Fund Ltd. is ₹ 70.71 (consisting 99% equity and remaining cash balance) and that of K Mutual Fund Ltd. is 62.50 (consisting 96% equity and balance in cash).

Following is the other information:

Particular	Equity Schemes	
	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Sharpe Ratio	2	3.3
Treynor Ratio	15	15
Standard deviation	11.25	5



There is no change in portfolios during the next month and annual average cost is ₹ 3 per unit for the schemes of both the Mutual Funds.

If Share Market goes down by 5% within a month, calculate expected NAV after a month for the schemes of both the Mutual Funds.

For calculation, consider 12 months in a year and ignore number of days for particular month.

### International Financial Management

15. Suppose you are a treasurer of XYZ plc in the UK. XYZ have two overseas subsidiaries, one is based in Amsterdam and another in Switzerland. The surplus position of funds in hand is as follows which it does not need for the next three months but will be needed at the end of that period (91 days).

Holding Company	£ 150,000
Swiss Subsidiary	CHF 1,996,154
Dutch Subsidiary	€ 1,450,000

Exchange Rate as on date are as follows:

Spot Rate (€) £0.6858 - 0.6869

91 day Pts 0.0037 0.0040

Spot Rate (£) CHF 2.3295 - 2.3326

91 day Pts 0.0242 0.0228

91-Day Interest rates on p.a. basis on the Deposits in Money Market are as follows:

Amount of Currency	£	€	CHF
0 – 200,000	1.00	0.25	Nil
200,001 – 1,000,000	2.00	1.50	0.25
1,000,001 – 2,000,000	4.00	2.00	0.50
Over 2,000,000	5.38	3.00	1.00

You have been approached by your banker wherein the above-mentioned surplus was lying, requesting you to swap the surplus lying with other two subsidiaries and place them in deposit with them.

Determine the minimum interest rate per annum (upto 3 decimal points) that should be offered by the bank to your organization so that your organization is ready to undertake such swap arrangement.

Note: Consider 360 days a year.

**Foreign Exchange Exposure and Risk Management**

16. Citi Bank quotes JPY/ USD 105.00 -106.50 and Honk Kong Bank quotes USD/JPY 0.0090 - 0.0093.
- Are these quotes identical if not then how they are different.
  - Is there a possibility of arbitrage?
  - If there is an arbitrage opportunity, then show how would you make profit from the given quotation in both cases if you are having JPY 1,00,000 or US\$ 1,000.
17. (a) Given:
- US\$ 1 = ¥ 107.31
- £ 1 = US\$ 1.26
- A\$ 1 = US\$ 0.70
- Calculate the cross rate for Pound in Yen terms
  - Calculate the cross rate for Australian Dollar in Yen terms
  - Calculate the cross rate for Pounds in Australian Dollar terms
- (b) The current spot exchange rate is \$1.35/£ and the three-month forward rate is \$1.30/£. According to your analysis of the exchange rate, you are quite confident that the spot exchange rate will be \$1.32/£ after 3 months.
- Suppose you want to speculate in the forward market then what course of action would be required and what is the expected dollar Profit (Loss) from this speculation?
  - What would be your Profit (Loss) in Dollar terms on the position taken as per your speculation if the spot exchange rate turns out to be \$1.26/£.
- Assume that you would like to buy or sell £1,000,000.

**Merger, Acquisition & Restructuring**

18. Following information is given in respect of WXY Ltd., which is expected to grow at a rate of 20% p.a. for the next three years, after which the growth rate will stabilize at 8% p.a. normal level, in perpetuity.

	For the year ended March 31, 2014
Revenues	₹ 7,500 Crores
Cost of Goods Sold (COGS)	₹ 3,000 Crores
Operating Expenses	₹ 2,250 Crores
Capital Expenditure	₹ 750 Crores
Depreciation (included in Operating Expenses)	₹ 600 Crores

During high growth period, revenues & Earnings before Interest & Tax (EBIT) will grow at 20% p.a. and capital expenditure net of depreciation will grow at 15% p.a. From year 4 onwards, i.e. normal growth period revenues and EBIT will grow at 8% p.a. and incremental capital expenditure will be offset by the depreciation. During both high growth & normal growth period, net working capital requirement will be 25% of revenues.

The Weighted Average Cost of Capital (WACC) of WXY Ltd. is 15%.

Corporate Income Tax rate will be 30%.

Required:

Estimate the value of WXY Ltd. using Free Cash Flows to Firm (FCFF) & WACC methodology.

The PVIF @ 15 % for the three years are as below:

Year	$t_1$	$t_2$	$t_3$
PVIF	0.8696	0.7561	0.6575

19. The following is the Balance-sheet of Grape Fruit Company Ltd as at March 31<sup>st</sup>, 2019.

Liabilities	(₹ in lakhs)	Assets	(₹ in lakhs)
Equity shares of ₹ 100 each	600	Land and Building	200
14% preference shares of ₹ 100/- each	200	Plant and Machinery	300
13% Debentures	200	Furniture and Fixtures	50
Debenture interest accrued and payable	26	Inventory	150
Loan from bank	74	Sundry debtors	70
Trade creditors	340	Cash at bank	130
		Preliminary expenses	10
		Cost of issue of debentures	5
		Profit and Loss account	525
	1440		1440

The Company did not perform well and has suffered sizable losses during the last few years. However, it is felt that the company could be nursed back to health by proper financial restructuring. Consequently the following scheme of reconstruction has been drawn up :

- (i) Equity shares are to be reduced to ₹ 25/- per share, fully paid up;

- (ii) Preference shares are to be reduced (with coupon rate of 10%) to equal number of shares of ₹ 50 each, fully paid up.
- (iii) Debenture holders have agreed to forgo the accrued interest due to them. In the future, the rate of interest on debentures is to be reduced to 9 percent.
- (iv) Trade creditors will forego 25 percent of the amount due to them.
- (v) The company issues 6 lakh of equity shares at ₹ 25 each and the entire sum was to be paid on application. The entire amount was fully subscribed by promoters.
- (vi) Land and Building was to be revalued at ₹ 450 lakhs, Plant and Machinery was to be written down by ₹ 120 lakhs and a provision of ₹15 lakhs had to be made for bad and doubtful debts.

Required:

- (i) Show the impact of financial restructuring on the company's activities.
- (ii) Prepare the fresh balance sheet after the reconstructions is completed on the basis of the above proposals.

### Theoretical Questions

20. Write short notes on:

- (a) Key decisions that fall within the scope of financial strategy
- (b) Market Indicators for Technical Analysis
- (c) Difference between Forward Contract and Future Contract
- (d) Limitations of Social Cost Benefit Analysis
- (e) Manner of purchase of Assets by Asset Reconstruction Companies

### SUGGESTED ANSWERS/HINTS

#### 1. Working Notes:

##### a. Computation of Annual Depreciation-

Particulars	₹
Purchase Price	26,00,000
Add: 1. Installation Charges	9,000
2. Fees Paid to Consultant for Advice	6,000
Total Cost of New Machine	26,15,000
Useful Life	8 Years
Annual Depreciation (Total Cost/No. of Years)	3,26,875

**b. Computation of Annual Cash Savings-**

Particulars	₹
Annual Earnings	3,15,000
Less-Tax @35%	1,10,250
Earning after Tax	2,04,750
Add-Depreciation on New Machine	3,26,875
Annual Cash Savings	5,31,625

**c. Tax effect on sale of Old Machine-**

Particulars	₹
Proceeds of Sale	12,500
Less- Cost of Removal	4,500
Net Proceeds	8,000
Less: WDV	76,000
Net Loss due to Sale	68,000
Tax savings due to Loss on Sale @35%	23,800
Total Cash Inflow due to Sale (₹ 8,000+₹ 23,800)	31,800

**Computation of Net Present Value**

Particulars	Period	Cash Flow (₹)	PVF @13%	PV (₹)
(a) Annual Cash inflow after Tax	1-8	5,31,625	4.8	25,51,800
(b) Net Salvage Value of Existing Machine	0	31,800	1.0	31,800
(c) Working Capital Realized	8	17,000	0.376	6,392
Present Value of Cash Inflows				25,89,992
Less: 1. Initial Investment	0	26,15,000	1.0	26,15,000
2. Initial Working Capital	0	17,000	1.0	17,000
NPV of the Proposal				(42,008)

Decision: Since NPV of the project is negative it is not viable.

**2. Working Notes:**

(i) Depreciation =  $\frac{\text{₹ } 5,00,00,000}{25} = \text{₹ } 20,00,000$  Per Annum

## (ii) Realization from Passenger

	Year 1	Year 2	Year 3	Year 4	Year 5
Passenger Capacity	60	60	60	60	60
Exp. Operational Capacity	80%	80%	90%	90%	90%
No. of Trips per Day	4	4	4	4	4
Average Realization Per Passenger (₹)	2,000	2,000	2,000	2,000	2,000
No. of Days	365	365	365	365	365
Realizations (₹)	14,01,60,000	14,01,60,000	15,76,80,000	15,76,80,000	15,76,80,000

## (iii) Statement Showing Cost

(₹)

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Cost of Manpower	2,50,00,000	2,75,00,000	3,02,50,000	3,32,75,000	3,66,02,500
Airport Handling Charges	36,50,000	36,50,000	36,50,000	36,50,000	36,50,000
Annual Repair & Maintenance	5,00,00,000	5,50,00,000	6,05,00,000	6,65,50,000	7,32,05,000
Daily Operating Exp.	2,73,75,000	3,01,12,500	3,31,23,750	3,64,36,125	4,00,79,738
Total	10,60,25,000	11,62,62,500	12,75,23,750	13,99,11,125	15,35,37,238

## (iv) Statement Showing NPV

(Amount in ₹)

	Year 1	Year 2	Year 3	Year 4	Year 5
Realizations	14,01,60,000	14,01,60,000	15,76,80,000	15,76,80,000	15,76,80,000
Cost of Operations	10,60,25,000	11,62,62,500	12,75,23,750	13,99,11,125	15,35,37,238
Depreciation	20,00,000	20,00,000	20,00,000	20,00,000	20,00,000
Profit Before Tax	3,21,35,000	2,18,97,500	2,81,56,250	1,57,68,875	21,42,762
Less: Tax	---	---	---	47,30,663	6,42,829
Profit after Tax	3,21,35,000	2,18,97,500	2,81,56,250	1,10,38,212	14,99,933
Add: Depreciation	20,00,000	20,00,000	20,00,000	20,00,000	20,00,000
	3,41,35,000	2,38,97,500	3,01,56,250	1,30,38,212	34,99,933
CE Factor	0.8	0.9	0.75	0.70	0.70
Certain Cash Flow	2,73,08,000	2,15,07,750	2,26,17,188	91,26,748	24,49,953
PVF@16%	0.862	0.743	0.641	0.552	0.476
PV of Cash Inflow	2,35,39,496	1,59,80,258	1,44,97,618	50,37,965	11,66,178
Total PV of Cash Inflow				6,02,21,515	

PV of Cash Outflow	5,00,00,000
NPV	1,02,21,515

Since NPV is positive Airborne Ltd. should accept the project.

### 3. Proposal 1

The loan amount is repayable together with the interest at the rate of 14% on loan amount and is repayable in equal installments at the end of each year. The PVAF at the rate of 14% for 5 years is 3.433, the amount payable will be

$$\text{Annual Payment} = \frac{\text{₹ } 100,00,000}{3.433} = \text{₹ } 29,12,904 \text{ (rounded)}$$

#### Schedule of Debt Repayment

End of Year	Total Payment ₹	Interest ₹	Principal ₹	Principal Amount Outstanding ₹
1	29,12,904	14,00,000	15,12,904	84,87,096
2	29,12,904	11,88,193	17,24,711	67,62,385
3	29,12,904	9,46,734	19,66,170	47,96,215
4	29,12,904	6,71,470	22,41,434	25,54,781
5	29,12,904	3,58,123*	25,54,781	-----

\* Balancing Figure

#### Schedule of Cash Outflows: Debt Alternative (Amount in ₹)

(1)	(2)	(3)	(4)	(3) + (4)	(5)	(6)	(7)	(8)
End of year	Debt Payment	Interest	Dep		Tax Shield [(3) + (4)] 0.50	Cash outflows (2) – (5)	PV factors @ 7%	PV
1	29,12,904	14,00,000	18,00,000	32,00,000	16,00,000	13,12,904	0.935	12,27,565
2	29,12,904	11,88,193	18,00,000	29,88,193	14,94,097	14,18,807	0.873	12,38,619
3	29,12,904	9,46,734	18,00,000	27,46,734	13,73,367	15,39,537	0.816	12,56,262
4	29,12,904	6,71,470	18,00,000	24,71,470	12,35,735	16,77,169	0.763	12,79,680
5	29,12,904	3,58,123	18,00,000	21,58,123	10,79,062	18,33,842	0.713	13,07,529
								63,09,655

Total present value of Outflows = ₹ 63,09,655

**Proposal 2**

(1)	(2)	(3)	(4)	(5)	(6)
End of year	Lease Rent	Tax Shield	Cash outflows (2) – (3)	PV factors @ 7%	PV
1	18,00,000	9,00,000	9,00,000	0.935	8,41,500
2	20,00,000	10,00,000	10,00,000	0.873	8,73,000
3	22,00,000	11,00,000	11,00,000	0.816	8,97,600
4	24,00,000	12,00,000	12,00,000	0.763	9,15,600
5	26,00,000	13,00,000	13,00,000	0.713	9,26,900
					44,54,600

Since PV of outflows is lower in the Leasing option, Robust Tech should go for leasing option to acquire printer.

**4. (i) Gordon's Formula**

$$\text{Retention Ratio} = \frac{\text{EPS} - \text{Dividend Per Share}}{\text{EPS}} = \frac{\text{₹}12 - \text{₹}3}{\text{₹}12} = 0.75 \text{ i.e. } 75\%$$

$$P_0 = \frac{E(1-b)}{K-br}$$

$$P_0 = \text{Present value of Market price per share}$$

$$E = \text{Earnings per share}$$

$$K = \text{Cost of Capital}$$

$$b = \text{Retention Ratio (\%)}$$

$$r = \text{IRR}$$

$$br = \text{Growth Rate}$$

$$P_0 = \frac{12(1-0.75)}{0.18 - (0.75 \times 0.22)}$$

$$= \frac{3}{0.18 - 0.165} = \text{₹ } 200$$



## (ii) Walter's Formula

$$V_c = \frac{D + \frac{R_a}{R_c}(E - D)}{R_c}$$

$$V_c = \text{Market Price}$$

$$D = \text{Dividend per share}$$

$$R_a = \text{IRR}$$

$$R_c = \text{Cost of Capital}$$

$$E = \text{Earnings per share}$$

$$= \frac{\text{₹ } 3 + \frac{0.22}{0.18}(\text{₹ } 12 - \text{₹ } 3)}{0.18}$$

$$= \frac{\text{₹ } 3 + \text{₹ } 11}{0.18} = \text{₹ } 77.77$$

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

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

Where,

$K_e$  = Cost of equity share capital

$D_1$  = Expected dividend at the end of year 1

$P_0$  = Current market price of the share.

$g$  = Expected growth rate of dividend.

$$\text{Therefore, } K_e = \frac{3.36}{146} + 7.5\%$$

$$= 0.0230 + 0.075 = 0.098$$

$$\text{Or, } K_e = 9.80\%$$

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

$$G = br \quad \text{i.e.}$$

$$= 0.10 \times 0.60 = 0.06$$

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:

$$0.075 = b_1 \times 0.10$$

$$b_1 = 0.75 \text{ and payout ratio} = 0.25$$

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  $K_e$  will be

$$K_e = \frac{5.376}{146} + 6.0\%$$

$$\text{or, } K_e = 9.68\%$$

Alternatively

EPS with 6% growth rate instead of 7.5%.

$$13.44 \times \frac{1.06}{1.075} = 13.25$$

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

$$D_1 = 13.25 \times 0.40 = 5.30$$

Accordingly new  $K_e$  will be

$$K_e = \frac{5.30}{146} + 6.0\%$$

$$\text{or, } K_e = 9.63\%$$

6. (i) The price of one Future Contract

Let X be the Price of Future Contract. Accordingly,

$$5 = \frac{\text{Rs. } 9,00,000}{X}$$

$$X (\text{Price of One Future Contract}) = ₹ 1,80,000$$

- (ii) Current Future price of the index =  $\frac{\text{Rs. } 1,80,000}{75} = 2400$

Let Y be the current Nifty Index (on 1<sup>st</sup> February 2020) then

$$\text{Accordingly, } Y + Y (0.09 - 0.06) \frac{4}{12} = 2400$$

$$\text{and } Y = \frac{2400}{1.01} = 2376.24$$

Hence Nifty Index on 1<sup>st</sup> February 2020 shall be approximately 2376.

- (iii) To determine whether the market is in Contango/ Backwardation first we shall compute Basis as follows:

$$\text{Basis} = \text{Spot Price} - \text{Future Price}$$

If Basis is negative the market is said to be in Contango and when it is positive the market is said to be Backwardation.

Since current Spot Price is 2400 and Nifty Index is 2376, the Basis is negative and hence there is Contango Market and maximum Contango shall be 24 (2400 – 2376).

- (iv) Pay off on the Future transaction shall be [(2400-2100) x 375] ₹ 112500

The Future seller gains if the Spot Price is less than Futures Contract price as position shall be reversed at same Spot price. Therefore, Mr. SG has gained Rs. 1,12,500/- on the Short position taken.

7. (i) Since trader has planned to sell after 3 months now it implies, he is in Long Position in Cash or Spot Market.
- (ii) Since the trader is in Long Position in Cash Market, he can mitigate its risk of reduced profit by hedging his position by selling Rice Futures i.e. Short Position in Future Market.

(iii) The gain on futures contract

$$= (\text{₹ } 59 - \text{₹ } 58) \times 22,000 \text{ kg.} = \text{₹ } 22,000$$

Revenue from the sale of Rice

$$= 22,000 \times \text{₹ } 57 = \text{₹ } 12,54,000$$

$$\text{Total Cash Flow} = \text{₹ } 12,54,000 + \text{₹ } 22,000 = \text{₹ } 12,76,000$$

$$\text{Cash Flow per kg. of Rice} = \frac{\text{₹ } 12,76,000}{22,000} = \text{₹ } 58$$

8. (i) DEF Bank will fix interest rate for 2V3 FRA after 2 years as follows:

XYZ Ltd.

$$(1+r) (1+0.0420)^2 = (1+0.0448)^3$$

$$(1+r) (1.0420)^2 = (1.0448)^3$$

$$r = 5.04\%$$

Bank will quote 5.04% for a 2V3 FRA.

ABC Ltd.

$$(1+r) (1+0.0548)^2 = (1+0.0578)^3$$

$$(1+r) (1.0548)^2 = (1.0578)^3$$

$$r = 6.38\%$$

Bank will quote 6.38% for a 2V3 FRA.

(ii)

		4.50% - Allow to Lapse	5.50%-Exercise
Interest	₹ 100 crores X 4.50%	₹ 4.50 crores	-
	₹ 100 crores X 5.04%	-	₹ 5.04 crores
Premium (Cost of Option)	₹ 100 crores X 0.1%	₹ 0.10 crores	₹ 0.10 crores
		4.60 crores	5.14 crores

9. To determine the prevailing rate of interest for the similar type of Bonds we shall compute the YTM of this Bond using IRR method as follows:

$$M = \text{₹ } 1000$$

$$\text{Interest} = \text{₹ } 95 (0.095 \times \text{₹ } 1000)$$

$n = 9$  years

$$V_0 = ₹ 1125.75 \text{ (₹ 1,000 + ₹ 125.75)}$$

YTM can be determined from the following equation

$$₹ 95 \times PVIFA (YTM, 9) + ₹ 1000 \times PVIF (YTM, 9) = ₹ 1125.75$$

Let us discount the cash flows using two discount rates 8% and 10% as follows:

Year	Cash Flows	PVF@6%	PV@6%	PVF@8%	PV@8%
0	-1125.75	1	-1125.75	1	-1125.75
1	95	0.943	89.59	0.926	87.97
2	95	0.890	84.55	0.857	81.42
3	95	0.840	79.80	0.794	75.43
4	95	0.792	75.24	0.735	69.83
5	95	0.747	70.97	0.681	64.70
6	95	0.705	66.98	0.630	59.85
7	95	0.665	63.18	0.583	55.39
8	95	0.627	59.57	0.540	51.30
9	1095	0.592	648.24	0.500	547.50
			112.37		-32.36

Now we use interpolation formula

$$6.00\% + \frac{112.37}{112.37 - (-32.36)} \times 2.00\%$$

$$6.00\% + \frac{112.37}{144.73} \times 2.00\% = 6.00\% + 1.553\%$$

YTM = 7.553% say 7.55%

Thus, prevailing interest rate on similar type of Bonds shall be approx. 7.55%.

10. (i) Current Market Price of Bond shall be computed as follows:

Year	Cash Flows	PVF@ 8%	PV@8%
1	75	0.926	69.45
2	75	0.857	64.28
3	75	0.794	59.55
4	75	0.735	55.13

5	75	0.681	51.08
6	75	0.630	47.25
7	75	0.583	43.73
8	1075	0.540	580.50
			970.97

Thus, the current market price of the Bond shall be ₹ 970.97.

**Alternatively**, using the Short-cut method the Market Price of Bond can also be computed as follows:

Interest+(Discount/Premium)/ Years to maturity

(Face Value + market Value)/2

Let market price be X

$$0.08 = \frac{75 + (1000 - X)/8}{(1000 + X)/2}$$

$$(1000 + X)/2$$

Thus, Value of X i.e. the price of Bond shall be ₹ 969.70

For the duration of the bond, we have to see the future cash flow and discount them as follows:

Year	CF	PV@8%	DCF	Proportion	Prop* Time (Yrs)
1	75	0.926	69.45	0.071	0.071
2	75	0.857	64.28	0.066	0.132
3	75	0.794	59.55	0.061	0.183
4	75	0.735	55.13	0.057	0.228
5	75	0.681	51.08	0.053	0.265
6	75	0.630	47.25	0.049	0.294
7	75	0.583	43.73	0.045	0.315
8	1075	0.540	580.50	0.598	4.784
		Total	970.97	1.000	6.272

$$\text{Volatility of the bond} = \text{Duration} / (1 + \text{Yield}) = 6.272/1.08 = 5.81$$

- (ii) If there is decrease in required yield by 50 bps the expected market price of the Bond shall be increased by:

$$= ₹ 970.97 \times 0.50 (5.81/100) = ₹ 28.21$$

Hence expected market price is ₹ 970.97 + ₹ 28.21 = ₹ 999.18

Alternatively, this portion using Bond Price as per Short-cut method can also be computed as follows:

$$= ₹ 969.70 \times 0.50 (5.81/100) = ₹ 28.17$$

then the market price will be = ₹ 969.70 + ₹ 28.17 = ₹ 997.87

11. (i) Sensitivity of each stock with market is given by its beta.

Standard deviation of market Index = 15%

Variance of market Index = 0.0225

Beta of stocks =  $\sigma_i r / \sigma_m$

$$A = 20 \times 0.60/15 = 0.80$$

$$B = 18 \times 0.95/15 = 1.14$$

$$C = 12 \times 0.75/15 = 0.60$$

- (ii) Covariance between any 2 stocks =  $\beta_1 \beta_2 \sigma_m^2$

**Covariance matrix**

Stock/Beta	0.80	1.14	0.60
A	400.000	205.200	108.000
B	205.200	324.000	153.900
C	108.000	153.900	144.000

- (iii) Total risk of the equally weighted portfolio (Variance) =  $400(1/3)^2 + 324(1/3)^2 + 144(1/3)^2 + 2(205.20)(1/3)^2 + 2(108.0)(1/3)^2 + 2(153.900)(1/3)^2 = 200.244$

- (iv)  $\beta$  of equally weighted portfolio =  $\beta_p = \sum \beta_i / N = \frac{0.80 + 1.14 + 0.60}{3}$

$$= 0.8467$$

- (v) Systematic Risk  $\beta_p^2 \sigma_m^2 = (0.8467)^2 (15)^2 = 161.303$

Unsystematic Risk = Total Risk – Systematic Risk

$$= 200.244 - 161.303 = 38.941$$

12. (i) Variance of Returns

$$\text{Cor}_{ij} = \frac{\text{Cov}(i, j)}{\sigma_i \sigma_j}$$

Accordingly, for MFX

$$1 = \frac{\text{Cov}(X, X)}{\sigma_X \sigma_X}$$

$$\sigma_X^2 = 4.800$$

Accordingly, for MFY

$$1 = \frac{\text{Cov}(Y, Y)}{\sigma_Y \sigma_Y}$$

$$\sigma_Y^2 = 4.250$$

Accordingly, for Market Return

$$1 = \frac{\text{Cov}(M, M)}{\sigma_M \sigma_M}$$

$$\sigma_M^2 = 3.100$$

(ii) Portfolio return, beta, variance and standard deviation

$$\text{Weight of MFX in portfolio} = \frac{1,20,000}{2,00,000} = 0.60$$

$$\text{Weight of MFY in portfolio} = \frac{80,000}{2,00,000} = 0.40$$

Accordingly Portfolio Return

$$0.60 \times 15\% + 0.40 \times 14\% = 14.60\%$$

Beta of each Fund

$$\beta = \frac{\text{Cov}(\text{Fund}, \text{Market})}{\text{Variance of Market}}$$

$$\beta_X = \frac{3.370}{3.100} = 1.087$$

$$\beta_Y = \frac{2.800}{3.100} = 0.903$$

Portfolio Beta

$$0.60 \times 1.087 + 0.40 \times 0.903 = 1.013$$



Portfolio Variance

$$\begin{aligned}\sigma_{XY}^2 &= w_X^2 \sigma_X^2 + w_Y^2 \sigma_Y^2 + 2 w_X w_Y \text{Cov}_{X,Y} \\ &= (0.60)^2 (4.800) + (0.40)^2 (4.250) + 2(0.60) (0.40) (4.300) \\ &= 4.472\end{aligned}$$

Or Portfolio Standard Deviation

$$\sigma_{XY} = \sqrt{4.472} = 2.115$$

(iii) Expected Return, Systematic and Unsystematic Risk of Portfolio

$$\text{Portfolio Return} = 10\% + 1.013 (12\% - 10\%) = 12.03\%$$

$$\text{MF X Return} = 10\% + 1.087(12\% - 10\%) = 12.17\%$$

$$\text{MF Y Return} = 10\% + 0.903(12\% - 10\%) = 11.81\%$$

$$\text{Systematic Risk} = \beta^2 \sigma^2$$

Accordingly,

$$\text{Systematic Risk of MFX} = (1.087)^2 \times 3.10 = 3.663$$

$$\text{Systematic Risk of MFY} = (0.903)^2 \times 3.10 = 2.528$$

$$\text{Systematic Risk of Portfolio} = (1.013)^2 \times 3.10 = 3.181$$

$$\text{Unsystematic Risk} = \text{Total Risk} - \text{Systematic Risk}$$

Accordingly,

$$\text{Unsystematic Risk of MFX} = 4.80 - 3.663 = 1.137$$

$$\text{Unsystematic Risk of MFY} = 4.250 - 2.528 = 1.722$$

$$\text{Unsystematic Risk of Portfolio} = 4.472 - 3.181 = 1.291$$

(iv) Sharpe and Treynor Ratios and Alpha

*Sharpe Ratio*

$$\text{MFX} = \frac{15\% - 10\%}{\sqrt{4.800}} = 2.282$$

$$\text{MFY} = \frac{14\% - 10\%}{\sqrt{4.250}} = 1.94$$

$$\text{Portfolio} = \frac{14.6\% - 10\%}{2.115} = 2.175$$

*Treynor Ratio*

$$\text{MFX} = \frac{15\% - 10\%}{1.087} = 4.60$$

$$\text{MFY} = \frac{14\% - 10\%}{0.903} = 4.43$$

$$\text{Portfolio} = \frac{14.6\% - 10\%}{1.013} = 4.54$$

*Alpha*

$$\text{MFX} = 15\% - 12.17\% = 2.83\%$$

$$\text{MFY} = 14\% - 11.81\% = 2.19\%$$

$$\text{Portfolio} = 14.6\% - 12.03\% = 2.57\%$$

13. Expected Turnover = ₹ 1600 lakhs + ₹ 286.40 = ₹ 1886.40 lakhs

	₹ in Lacs	₹ in Lacs
<i>Advance to be given:</i>		
Debtors ₹1886.40 lakhs x 100/360	524.00	
Less: 10% withholding	<u>52.40</u>	471.60
Less: Commission 1.75%		<u>9.17</u>
Net payment		462.43
Less: Interest @14% for 100 days on ₹ 462.43 lacs		<u>17.98</u>
		<u>444.45</u>
<i>Calculation of Average Cost:</i>		
Total Commission ₹1886.40 lakhs x 1.75%		33.01
Total Interest ₹ 17.98 lacs x 360/100		<u>64.73</u>
		97.74
Less: Admin. Cost	8.00	
Saving in Bad Debts (₹1886.40 lacs x 1.50% x 85%)	<u>24.05</u>	<u>32.05</u>
		<u>65.69</u>
Effective Cost of Factoring = 65.69/444.45 x 100		14.78%

**14. Working Notes:**

- (i) Decomposition of Funds in Equity and Cash Components

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
NAV on 31.12.19	₹ 70.71	₹ 62.50
% of Equity	99%	96%
Equity element in NAV	₹ 70	₹ 60
Cash element in NAV	₹ 0.71	₹ 2.50

- (ii) Calculation of Beta

- (a) D Mutual Fund Ltd.

$$\text{Sharpe Ratio} = 2 = \frac{E(R) - R_f}{\sigma_D} = \frac{E(R) - R_f}{11.25}$$

$$E(R) - R_f = 22.50$$

$$\text{Treynor Ratio} = 15 = \frac{E(R) - R_f}{\beta_D} = \frac{22.50}{\beta_D}$$

$$\beta_D = 22.50/15 = 1.50$$

- (b) K Mutual Fund Ltd.

$$\text{Sharpe Ratio} = 3.3 = \frac{E(R) - R_f}{\sigma_K} = \frac{E(R) - R_f}{5}$$

$$E(R) - R_f = 16.50$$

$$\text{Treynor Ratio} = 15 = \frac{E(R) - R_f}{\beta_K} = \frac{16.50}{\beta_K}$$

$$\beta_K = 16.50/15 = 1.10$$

- (iii) Decrease in the Value of Equity

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Market goes down by	5.00%	5.00%
Beta	1.50	1.10
Equity component goes down	7.50%	5.50%

- (iv) Balance of Cash after 1 month

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Cash in Hand on 31.12.19	₹ 0.71	₹ 2.50
Less: Exp. Per month	₹ 0.25	₹ 0.25
Balance after 1 month	₹ 0.46	₹ 2.25

## NAV after 1 month

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Value of Equity after 1 month		
70 x (1 - 0.075)	₹ 64.75	-
60 x (1 - 0.055)	-	₹ 56.70
Cash Balance	0.46	2.25
	65.21	58.95

15. XYZ plc shall be ready to undertake this swap arrangement only if it receives the interest on the surplus funds if invested on individual basis as follows:

	Interest	Amt. after 91 days	Conversion in £
Holland € 1,450,000 x 0.02 x 91/360 =	€ 7,330.56	€ 1,457,330.56	£1,004,829.42 (1,457,330.56 x 0.6895)
Switzerland CHF 1,996,154 x 0.005 x 91 / 360 =	CHF 2,522.92	CHF 1,998,676.92	£865,303.02 (1,998,676.92 ÷ 2.3098)
UK £ 150,000 x 0.01 x 91/360 =	£ 379.17	£ 150,379.17	£ 150,379.17
Total GBP at 91 days			<u>£ 2,020,511.61</u>

## Swap to Sterling

Sell € 1,450,000 (Spot at 0.6858) buy £	£ 994,410.00
Sell CHF 1,996,154 (Spot at 2.3326) buy £	£ 855,763.53
Independent GBP amount	£ 150,000.00
	£ 2,000,173.53
Amount accrued on Individual Basis (Principal + Interest)	£ 2,020,511.61
Interest Required	£ 20,338.08
Required Interest Rate on Per Annuam Basis $\frac{20,338.08}{2,000,173.53} \times \frac{360}{91} \times 100$	4.023%

Thus, the minimum rate that should be offered is 4.023%.

16. (a) No, while Citi Bank's quote is a Direct Quote for JPY (i.e. for Japan) the Hong Kong Bank quote is a Direct Quote for USD (i.e. for USA).
- (b) Since Citi Bank quote imply USD/ JPY 0.0094 - 0.0095 and both rates exceed those offered by Hong Kong Bank, there is an arbitrage opportunity.

Alternatively, it can also be said that Hong Kong Bank quote imply JPY/ USD 107.53 – 111.11 and both rates exceed quote by Citi Bank, there is an arbitrage opportunity.

- (c) Let us how arbitrage profit can be made.

(i) Covert US\$ 1,000 into JPY by buying from Hong Kong Bank JPY 1,07,530

Sell these JPY to Citi Bank at JPY/ USD 106.50 and convert in US\$ US\$ 1009.67

Thus, arbitrage gain (US\$ 1009.67 - US\$ 1000.00) US\$ 9.67

(ii) Covert JPY 1,00,000 into USD by buying from Citi Bank at JPY/ USD 106.50  
US\$ 938.97

Sell these US\$ to Hong Kong Bank at JPY/ USD 107.53 and convert in US\$  
JPY 100967.44

Thus, arbitrage gain (JPY 1,00,967.44 - JPY 1,00,000) JPY 967.44

17. (a) (i) Calculate the cross rate for Pounds in Yen terms

1£ = ? ¥

US\$1 = ¥ 107.31

£ 1 = US\$ 1.26

$$\frac{¥}{\$} \times \frac{\$}{£} = \frac{¥}{£}$$

$$\frac{¥}{£} = 107.31 \times 1.26$$

£1 = ¥ 135.21

- (ii) Calculate the cross rate for Australian Dollar in Yen terms

A\$1 = ¥ ?

US\$1 = ¥ 107.31

A\$ 1 = US\$ 0.70

$$\frac{¥}{\$} \times \frac{\$}{A\$} = \frac{¥}{A\$}$$

$$\frac{\text{¥}}{\text{A\$}} = 107.31 \times 0.70$$

$$\text{A\$ } 1 = \text{¥ } 75.12$$

(iii) Calculate the cross rate for Pounds in Australian Dollar terms

$$\text{£ } 1 = \text{A\$ } ?$$

$$\text{A\$ } 1 = \text{US\$ } 0.70$$

$$\text{US\$ } 1 = \text{A\$ } 1.4286$$

$$\text{£ } 1 = \text{US\$ } 1.26$$

$$\frac{\text{A\$}}{\text{\$}} \times \frac{\text{\$}}{\text{£}} = \frac{\text{A\$}}{\text{£}}$$

$$\frac{\text{A\$}}{\text{£}} = 1.4286 \times 1.26 = 1.80$$

$$\text{£ } 1 = \text{A\$ } 1.80$$

- (b) (i) If you believe the spot exchange rate will be \$ 1.32/£ in three months, you should buy £ 1,000,000 forward for \$1.30/£ and sell at \$ 1.32/£ 3 months hence.

$$\text{Your expected profit will be: £1,000,000} \times (\$1.32 - \$1.30) = \$20,000$$

- (ii) If the spot exchange rate turns out to be \$1.26/£ in three months, your loss from the long position in Forward Market will be: -

$$\text{£ } 1,000,000 \times (\$ 1.26 - \$1.30) = \$ 40,000$$

**18. Determination of forecasted Free Cash Flow of the Firm (FCFF)** (₹ in crores)

	Yr. 1	Yr. 2	Yr 3	Terminal Year
Revenue	9000.00	10800.00	12960.00	13996.80
COGS	3600.00	4320.00	5184.00	5598.72
Operating Expenses	1980.00*	2376.00	2851.20	3079.30
Depreciation	720.00	864.00	1036.80	1119.74
EBIT	2700.00	3240.00	3888.00	4199.04
Tax @30%	810.00	972.00	1166.40	1259.71
EAT	1890.00	2268.00	2721.60	2939.33
Capital Exp. – Dep.	172.50	198.38	228.13	-
Δ Working Capital	375.00	450.00	540.00	259.20
Free Cash Flow (FCF)	1342.50	1619.62	1953.47	2680.13

\* Excluding Depreciation.

Present Value (PV) of FCFF during the explicit forecast period is:

FCFF (₹ in crores)	PVF @ 15%	PV (₹ in crores)
1342.50	0.8696	1167.44
1619.62	0.7561	1224.59
1953.47	0.6575	1284.41
		3676.44

PV of the terminal, value is:

$$\frac{2680.13}{0.15 - 0.08} \times \frac{1}{(1.15)^3} = ₹ 38287.57 \text{ Crore} \times 0.6575 = ₹ 25174.08 \text{ Crore}$$

The value of the firm is :

$$₹ 3676.44 \text{ Crores} + ₹ 25174.08 \text{ Crores} = ₹ 28,850.52 \text{ Crores}$$

#### 19. (a) Impact of Financial Restructuring

##### (i) Benefits to Grape Fruit Ltd.

##### (1) Reduction of liabilities payable

	₹ in lakhs
Reduction in equity share capital (6 lakh shares x ₹75 per share)	450
Reduction in preference share capital (2 lakh shares x ₹50 per share)	100
Waiver of outstanding debenture Interest	26
Waiver from trade creditors (₹340 lakhs x 0.25)	<u>85</u>
	661
(2) Revaluation of Assets	
Appreciation of Land and Building (₹450 lakhs - ₹200 lakhs)	<u>250</u>
Total (X)	<u>911</u>

##### (ii) Amount of ₹ 911 lakhs utilized to write off losses, fictitious assets and over-valued assets.

Writing off profit and loss account	525
Cost of issue of debentures	5
Preliminary expenses	10
Provision for bad and doubtful debts	15
Revaluation of Plant and Machinery (₹300 lakhs – ₹180 lakhs)	<u>120</u>