Time Allowed: 3 Hours   **Full Marks: 100**

The figures in the margin on the right side indicate full marks.

Where considered necessary, suitable assumptions may be made and

clearly indicated in the answer.

Question No. 1 and 8 are compulsory; Answer any four from Question No. 2, 3, 4, 5, 6 & 7.

SECTION - A

1.   (a)

Sl. No.	Answer	Justification
(i)	(d)	Low value addition does not create any barrier for the new entrants rather it provides the space for them in the market. So, the correct option is (d).
(ii)	(a)	Operational risk is a part of business risk and hence not a part of financial risk. So, the correct option is (a).
(iii)	(d)	Euro notes are of three types – Commercial Papers, Note Issuance Facilities and Medium Term Notes. So, the correct option is (d)
(iv)	(b)	Leveraged lease refers to a lease agreement wherein the lessor acquires an asset partially financed by the financial institutions and lease out the same to the lessee for the agreed lease payments. So, the correct option is (b)
(v)	(d)	DCL = % change in EPS/% change in sales So, So, the correct option is (d)
(vi)	(b)	The Forward Price (F) = $340 \times e^{6/12 \times 0.12}$ = 340×1.0618 = ₹361.012 So, the correct option is (b).
(vii)	(c)	Payback Reciprocal = ₹ 10 lakh ÷ ₹50 lakh = 1/5 or 20% So, the correct option is (c).
(viii)	(b)	Intrinsic value of a share = $D_1/(K_e – g)$ = 2.1/ $(K_e – 0.05)$ = 12.35 or, K_e = 0.05 + 2.1/12.35 = 22% $E(R) = Rf + \beta (Rm - Rf) = Rf (1 - \beta) + \beta Rm$ 22% = Rf (-1) + 2 × 14% , or, Rf = 6% So, the correct option is (b).
(ix)	(c)	The diffusion index = 6/10 = 60% So, the correct option is (c).
(x)	(c)	$F = S \times [(1 + r_A)^n/ (1+ r_B)^n]$; or, F(₹/$) = 78.50 x $[1 + 0.08]^5 / (1+ 0.03)^5]$ = 78.50 x 1.267455 = ₹99.50 So, the correct option is (c).

SECTION - B

2.   (a)   (i)   **Project A**

End of Year	0	1	2	3	4
Cash Outflow	-(60)				
Cash inflows		30	55	60	25
Cash inflows after tax		18	33	36	15
Depreciation tax shield		6	6	6	6
Effective cash flows after tax and depreciation shield		24	39	42	21
PV factor	1.0	0.870	0.756	0.658	0.572
PV of Cash inflows		20.88	29.48	27.64	12.01
Total of PV of inflows	90.01				
PV of outflows	-(60.00)				
NPV	+30.01				

Project B

End of Year	0	1	2	3	4
Cash Outflow	-(60)				
Cash inflows		25	60	65	
Cash inflows after tax		15	36	39	
Depreciation tax shield		24			
Effective cash flows after tax and depreciation shield		39	36	39	
PV factor	1.0	0.870	0.756	0.658	0.572
PV of Cash inflows		33.93	27.22	25.66	
Total of PV of inflows	86.81				
PV of outflows	-(60.00)				
NPV	+26.81				

NPV of Project A is higher, but the project lives are unequal. 12 lacs of A's PV in the 4 years has been in favour of A compared to B. Hence, choice based on NPV is not appropriate.

Equal annual inflows of A = 90.01/2.856 = 31.52 (PV Annuity 15%, 4 years = 2.856)

Equal annual cash inflows of B = 86.81 / 2.284 = 38.00 (PV Annuity 15%, 3 years = 2.284) Since B yields higher equated annual inflows, B is the better choice. This measure is appropriate for projects with unequal lives.

(b) Different type of securities issued by the special purpose vehicle (SPV) in securitization transactions are as follows:

a. Pass Through Certificates: In case of a pass-through certificate, payments to investors depend upon the cash flow from the assets backing such certificates. That is to say, as and when cash (principal and interest) is received from the original borrower by the SPV, it is passed on to the holders of certificates at regular intervals and the entire principal is returned with the retirement of the assets packed in the pool.

b. Pay Through Certificates: Pay through certificates has a multiple maturity structure depending upon the maturity pattern of underlying assets. Thus, the SPV can issue two or three different types of securities with different maturity patterns like short term, medium term and long term. Thus, these have a greater flexibility with varying maturity pattern needed by the investors.

c. Preferred Stock Certificates: These are issued by a subsidiary company against the trade debts and consumer receivables of its parent company. In other words, subsidiary companies buy the trade debts and receivables of parent companies to enjoy liquidity. Generally, these stocks are backed by guarantees given by highly rated merchant banks and hence they are also attractive from the investor's point of view. These instruments are generally short term in nature.

d. Asset Backed Commercial Papers: This type of structure is mostly prevalent in mortgage-backed securities. Under this the SPV purchases portfolio of mortgages from different sources (various lending institution) and they are combined into a single group on the basis of interest rate, maturity dates and underlying collaterals. They are then transferred to a Trust which in turn issued mortgage-backed certificate to the investors. These are also of short term in nature.

e. Interest Only Certificates: In case of these certificates, payments are made to investors only from the interest incomes earned from the assets securitized.

f. Principal Only Certificates: As the very name suggest payment are made to the investors only from the repayment of principal by the original borrower. These certificates enable speculative dealings since the speculators know well that the interest rate movements would affect the bond value immediately. When interest rate increases, the bond value will decline and vice-versa.

3. **(a)** **(i)** The net present value of each path at 12% discount rate is given below:

Path	Cash inflow year 1*discount factor year 1	cash inflow year 2*discount factor year 2	Total inflow	cash outflow	NPV
1	₹ 25000*.8929=22323	12000*.7972=9566	31889	40000	-8111
2	₹ 25000*.8929=22323	16000*.7972=12755	35078	40000	-4922
3	₹ 25000*.8929=22323	25000*.7972=19930	42253	40000	2253
4	₹30000*.8929=26787	20000*.7972=15944	42731	40000	2731
5	₹30000*.8929=26787	25000*.7972=19930	46717	40000	6717
6	₹30000*.8929=26787	30000*.7972=23916	50703	40000	10703

Statement showing Expected Net Present Value

Path	NPV @12%	Joint probability	Expected NPV
1	-8111	0.08	-648.88
2	-4922	0.12	-590.64
3	2253	0.2	450.60
4	2731	0.24	655.44
5	6717	0.3	2015.1
6	10703	0.06	642.18
			2523.8

(ii) If the worst outcome is realized, the Net Present Value which the project will yield is ₹ 8111(negative). The probability of occurrence of this NPV is 8%

(iii) The best outcome will be path 6 when NPV is higher i.e., ₹10703(positive). The probability of occurrence of this NPV is 6%

(b) Non-fungible tokens (NFTs) are cryptographic assets on a blockchain with unique identification codes and metadata that distinguish them from each other. Unlike cryptocurrencies (which are fungible as each unit of cryptocurrency represent same value and characteristics), these are non-fungible as each NFT is unique. Non-fungible tokens can digitally represent any asset, including online-only assets like digital artwork and real assets such as real estate. Today, however, much of the current market for NFTs is centered around collectibles, such as digital artwork, sports cards, and rarities. Perhaps the most hyped space is NBA Top Shot, a place to collect non-fungible tokenized NBA moments in digital card form. Some of these cards have sold for millions of dollars. Recently, Twitter's (TWTR) Jack Dorsey tweeted a link to a tokenized version of the first tweet ever, in which he wrote: "just setting up my twttr." The NFT version of the first-ever tweet sold for more than $2.9 million.

NFTs are created through a process called 'asset tokenization'. Asset tokenization is the process by which an issuer creates digital tokens on a distributed ledger or blockchain (Ethereum being most popular), which represent either digital or physical assets.

NFTs can be bought and sold in NFT marketplace such as Rarible, OpenSea, Foundation. However, to buy NFTs from this marketplace, one will require a wallet and need to fund it. In most of the platforms wallets are required to be funded by cryptocurrencies and the widely accepted cryptocurrency in this context is the Ethereum.

4.   (a)   (i)

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \frac{D_3\,(1+g)}{(1+k)^3(k-g)}$$

$= 8/1.14 + 14/(1.14)^2 + 22/(1.14)^3 + 22.88/[(1.14)^3 \times (0.14 - 0.04)]$

$= ₹187.08$

Therefore, the price of the share is ₹187.08 through DDM (dividend discount model).

(ii)   In this case the number of half-yearly periods is 10, the half-yearly interest payment is ₹ 7, and the discount rate applicable to a half-yearly period is 8 percent. Hence, the value of the bond is:

V = 7 PVIFA (8%, 10) + 100 PVIF (8%, 10)

= 7 PVIFA (8%, 10) + 100 PVIF (8%, 10)

= 7 (6.710) + 100 (0.463)

= 46.97 + 46.30

= Rs 93.27

(b)   Given the total initial investments is ₹98,00,000, out of the issue proceeds of ₹1,00,00,000. Therefore. the balance of ₹ 2,00,000 is considered as Issue Expenses.

Computation of Closing Net Asset Value

Particulars	Opening value of Investments (₹)	Capital Appreciation (₹)	Closing value of investments (₹)	Income (₹)
Equity Shares	80,00,000	7,50,000	87,50,000	12,00,000
7% Govt. Securities	8,00,000	NIL	8,00,000	56,000
9% Debentures (Unlisted)	5,00,000	NIL	5,00,000	45,000
10% Debentures(Listed)	5,00,000	(-)50,000	4,50,000	50,000
Total	98,00,000	7,00,000	1,05,00,000	13,51,000
Less: operating expenses during the period				(5,00,000)
Net Income				8,51,000

Net Fund Balance = ₹ (1,05,00,000+8,51,000)	1,13,51,000
Less: Dividend = (10,00,000 × 0.90)	(9,00,000)
Net Fund Balance (after Dividend)	1,04,51,000
NAV(Before considering Dividends) ₹1,13,51,000 ÷ 10,00,000	11.35
NAV(After Dividends) ₹ 1,04,51,000 ÷ 10,00,000	10.45

5. **(a)** **(i)** Expected rate of return

	Total Investment (₹)	Dividend (₹)	Capital Gain (₹)
A Ltd.	30	3	30
B Ltd.	40	3	30
C Ltd.	50	2	100
GOI Bonds	1000	140	10
	1120	148	170

Expected Return on Market Portfolio = (148 + 170)/1120 = 28.39%

CAPM, $E(R_P) = R_F + \beta [E(R_M) - R_F]$

A Ltd.	14+0.9(28.39-14)	= 14+12.95	=26.95%
B Ltd.	14+0.8(28.39-14)	= 14+11.51	=25.51%
C Ltd.	14+0.6(28.39-14)	= 14+8.63	=22.63%
GOI Bonds	14+0.01(28.39-14)	=14+0.14	=14.14%

(ii) Average Return of Portfolio = (26.95+25.51+22.63+14.14)/4 = 22.31%

Alternatively, (0.9+0.8+0.6+0.01)/ 4 = 2.31/4 = 0.5775

14 + 0.5775 (28.39 – 14) = 14 + 8.31 = 22.31%.

(b)

DETAILS	A	B	C	D
Risk free return	8	8	8	8
Fund invested	100% money multiplier	50% MM and 50% balanced growth	80% balanced growth and 20% safe money	Market
Beta	1.80	0.5 × 1.3 + 0.5 × 1.8 = 1.55	0.8 × 1.3 + 0.2 × 0.75 = 1.19	1.00
Return on portfolio	24	0.5 × 24 + 0.5 × 17.5 = 20.75	0.8 × 17.5 + 0.2 × 13 = 16.6	16
Treynor's ratio = (Rp-Rf)/β	(24-8)/1.8 = 8.89	(20.75-8)/ 1.55 =8.23	(16.6 - 8)/1.19 =7.23	(16-8) / 1 = 8
Rank	1	2	4	3

6.   **(a)**   A generic approach towards risk management must include the following steps:

     (i)   Setting the Objectives:

        Determination of objectives is essential step in the risk management. The objective may be to protect/enhance profits or to develop competitive advantage. The objectives must be decided by the management and in this process company's risk tolerance must be taken into account.

     (ii)   Identification of Risk

        The next step in the risk management process is identification of risk. Every firm faces different types of risks - based on its organizational structure, nature of business, the economic conditions, social and political factors, the status of the industry it operates. Any risk needs to be identified initially and then categorized as per its nature and character.

     (iii)   Measurement and Prioritization of Risk

        Once the risks are identified, they need to be evaluated for ascertaining their significance. The significance of a particular risk depends upon the size of the loss (expected severity of consequences) that it may result in, and the probability of the occurrence of such loss (or, expected frequency). On the basis of these two factors, various risks faced by a company need to be classified as critical risks, important risks and not-so-important risks. This may be termed as risk prioritization. The severity is measured by using various risk measures.

     (iv)   Development of Strategy

        Strategy setting is an important task in managing risk, as it sets a direction for the business as a whole. A strategy is essentially an action plan, which specifies the nature of risk to be managed and the timing. It also specifies the tools, techniques and instruments that can be used to manage these risks. Besides, it also deals with tax and legal problems.

        Responses to risk generally fall into the following categories:

        Risk avoidance: action is taken to halt the activities giving rise to risk, such as a product line, a geographical market or a whole business unit.

        Risk reduction: action is taken to mitigate the risk of likelihood or impact or both, generally via internal controls.

        Risk sharing or transfer: action is taken to transfer a portion of the risk through insurance, outsourcing or hedging.

        Risk acceptance: no action is taken to affect likelihood or impact.

     (v)   Implementation of Strategy

        Once the policies and strategies are in place, they need to be implemented for actually managing the risks; where actual execution of risk management takes

place. This includes finding the best deal in case of risk transfer, providing for contingencies - in case of risk retention, designing and implementing risk control programs, etc. It also includes eyeing for operational details, like the back-office work, to ensure compliance controls.

(vi) Monitoring Risk

Risk monitoring is the last major element of risk management - but certainly not the least important. The function of risk management needs to be reviewed periodically, depending on the costs involved.

Risk management is a process or cycle which works continuously and in a repetitive manner. After monitoring the risk, the process of risk identification is done because risk keeps on changing its form as various new requirements come periodically.

(b) Computation of existing portfolio beta:

Stock	Market value of stock (₹ in lakh)	Proportion	Beta of the stock	Weighted beta
X	1600	4/13	1.1	0.34
Y	2400	6/13	1.2	0.55
Z	1200	3/13	1.3	0.30
Total	5200			1.19

Value per futures contract = Index price per contract × Lot size per futures contract = 28,000 × 100 = ₹28,00,000.

(i) To reduce portfolio beta to 0.8, the manager should sell index futures contract.

Portfolio value = ₹5200 lakh

Value per futures contract = Index price per contract × Lot size per futures contract = 28,000 × 100 = ₹28,00,000

Beta of the existing portfolio =1.19

Desired beta of the new portfolio = 0.8

No. of contracts to be sold

= Portfolio Value × (Beta of the portfolio-Desired Value of Beta)/Value of the futures Contract Number of Contracts = 5,200 lakhs × (1.19-0.8)/28 lakh =72.42, say 73 contracts.

(ii) To increase the portfolio beta to 1.5 the manager should buy index futures contract.

Portfolio value = ₹5200 lakh

Value per futures contract = Index price per contract × Lot size per futures contract = 28,000 × 100 = ₹28,00,000

Beta of the existing portfolio = 1.9

Desired beta of the new portfolio = 1.5

No. of contracts to be bought = 5,200 lakhs × (1.5-1.19)/28lakh = 57.57, say 58 contracts.

7. (a) (i) An American Depositary Receipt (ADR) is a certificate that represent shares of a foreign stock owned and issued by a U.S. bank. The foreign shares are usually held in custody overseas, but the certificates trade in the U.S. Through this system, a large number of foreign-based companies are actively traded on one of the three major U.S. equity markets (the NYSE, AMEX or Nasdaq).

These are a class of investment which allows international investors to own shares in foreign companies where the foreign market is hard to access for the retail investor, and without having to worry about foreign currencies and tax treatments. Global Depository Receipts are issued by international investments banks as certificates (the GDR) which represents the foreign shares but which can be traded on the local stock exchange. For example, a UK investor may be able to buy shares in a Vietnamese company via a GDR issued by a UK investment bank. The GDR will be denominated in GB Pounds and will be tradable on the London Stock Exchange. The investment bank takes care of currency exchange, foreign taxes etc. and pays dividends on the GDR in GB Pounds.

(ii)

Option	Put
Strike price	₹81 per US $
Premium	₹ 1 per US $
Settlement (expiration) rate	₹ 79.50

Benefit from Put option = Max [(Strike rate – Expiration rate),0] – Premium

= Max [(₹ 81 per US $ - ₹ 79.50 per US $), 0] – ₹ 1 per US $

= ₹ (1.50 – ₹ 1) per US $ = ₹ 0.50 per US $

Here, if the exporter remains un-hedged, it will receive = [₹ 79.50 per US $ x US $ 1,00,000) = ₹ 79,50,000

But with hedging using Put Option, the exporter receives at the end of 90 days = [(₹ 81 x US $ 1,00,000) – (₹ 1 x US $ 1,00,000)] = ₹ 80,00,000

Gain = ₹ 50,000

OR Gain = (71 – 69.50) – 1 = 1.5 – 1 = 0.5 ₹/$

1,00,000$ x 0.5 = 50,000 ₹

As there is benefit in owing the Put, so the Exporter should hedge using the Put Option.

(b) The importer will loss if the $ appreciates, as is indicated by the forward rate/ Spot rate on 1/9/2022= 74.10 ₹/$ (Since, ₹10,18,875/$13,750)

3m forward rate = 1/0.01340 = 74.63

Hence by a forward contract, he will ask his banker to sell him at ₹ 74.63, 3 months later, irrespective of what happens to the spot rate on 1st Dec.

(i) On Dec 1st, if the sport rate increases to 74.74 (i.e., 1/0.01338),

Half of his exposure is hedged.

His pay-out will be on 1st Dec, 13750/2 × 74.74+13750/2 × 74.63

i.e., 6875 × 74.40 + 6875 × 74.63 = 513838 + 513081 = 10,26,919.

If he had not gone for the Forward contract, he would have paid 13750 x 74.74= 10,27,675

By forward contract, the net gain is 1027675– 1026919 = 757

Or

He can still buy from his bank at 74.63. He saves ₹0.11 per $ by hedging

i.e., 0.11x6875= 757

(ii) If the exchange rate falls to 73.96 (i.e., 1/0.01352) on 1st December,

His pay out on 1/12 will be 6875 x 73.96 + 6875 x 74.63

i.e., he will pay 508475 + 513081 = 1021556

If not gone for forward contract, he would have paid 13750 x 73.96 = 10,16,950

By forward contract the net loss = 1021556 – 1016950 = ₹4,606

Or

He will lose due to the forward contract to the extent of 6875 x (74.63 – 73.96) = ₹4,606 Since the forward rate was indicting a premium, the importer would only go for forward purchase agreement from the bank. If the actual spot rate goes in a different direction, then the forward contract will not result in hedging and will instead create loss.

8. **(a)**

Particulars		Cost of Funds Y and HRS	
	Objective	Fixed Rate	Floating Rate
Y	Floating	9.5% p.a.	LIBOR +2%
HRS	Fixed	13.5% p.a.	LIBOR +2%
Differential in absolute terms		4%	0

The differential between two markets = 4% - 0% = 4%.

A total of 4% needs to be shared between Y, HRS and Swap Dealer.

Since HRS cannot pay more than 12% as against the fixed rate funding of 13.5%, it requires 1.5% benefit out of 4%. Commission to swap dealer is 0.5%. so, benefit to Y =4% - 1.5% - 0.5% = 2%.

The swap can therefore be structured as follows:

Firm	Paid to Swap Dealer	Received from Swap Dealer	Paid to Market	Net Cost	Savings
Y	LIBOR	9.50%	9.50%	LIBOR	LIBOR+2% - LIBOR = 2%
HRS	10%	LIBOR	12%	12%	13.5% - 12% = 1.5%

Y gets floating rate funds at LIBOR as against LIBOR +2%, thereby getting advantage of 2% HRS gets fixed rate funds at 13.5%, there by getting advantage of 1.5%.

Finally Swap Dealer get commission of 0.5%.

Schematic Diagram
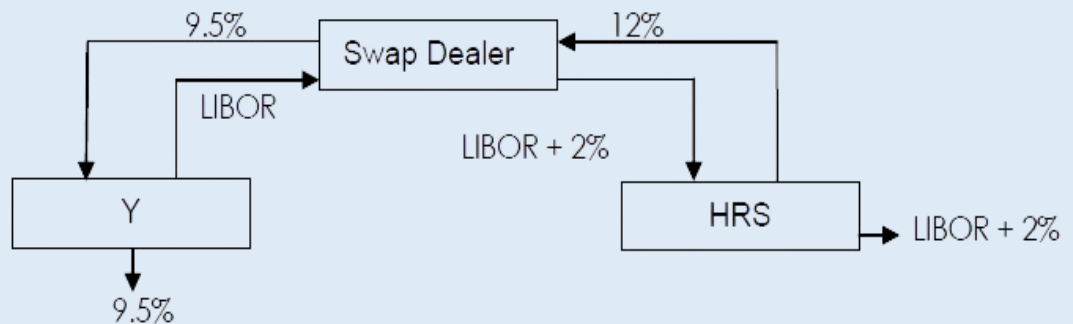
Effective interest rates: If HRS is able to negotiate such that its total outflow is 12%, Commission will be borne by Y.

Hence, effective interest rate for Y = LIBOR

HRS = 12%

Alternatively, Y = LIBOR + 2% - 2.25% = LIBOR – 0.25%

HRS = 12% (Fixed) + 0.25% (Commission) = 12.25% (Fixed).