(5% + 0.25%) = 5.25%

(ii) Borrow from US Bank Interest

$\frac{4\%}{1-0.08}$ = 4.35%

Premium in \$ = $\left[\frac{1.05}{1.04} - 1\right]$ = 0.96%

= 5.31%

(iii) Borrow from Swiss Bank

Interest = $\left[\frac{3\%}{1-0.08}\right]$ = 3.26%

Premium in SF = $\left[\frac{1.05}{1.03} - 1\right] \times 100$ = 1.94%

= 5.20%

Borrow from Swiss Bank is better due to lower cash outflows.

Cash outflows = € 1,00,000 × 1.052

= € 1,05,200

(10) CURRENCY OF INVESTMENT

Question – 66

Your bank's London office has surplus funds to the extent of USD 5,00,000/- for a period of 3 months. The cost of the funds to the bank is 4% p.a. It proposes to invest these funds in London, New York or Frankfurt and obtain the best yield, without any exchange risk to the bank. The following rates of interest are available at the three centers for investment of domestic funds there at for a period of 3 months.

London	5 % p.a.
New York	8% p.a.
Frankfurt	3% p.a.

The market rates in London for US dollars and Euro are as under:

London on New York

Spot	1.5350/90
1 month	15/18
2 months	30/35
3 months	80/85

London on Frankfurt

Spot	1.8260/90
1 month	60/55
2 months	95/90
3 months	145/140

At which centre, will be investment be made & what will be the net gain (to the nearest pound) to the bank on the invested funds?

(SM TYK – 49, RTP Nov – 2021 & Exam Nov – 2013) (8 Marks)

Solution:

Option 1: Investment in London

Fund available = $ 5,00,000

Convert $ 5,00,000 at SR $/£ 1.5390

$$\frac{\$\ 5,00,000}{£\ 1.5390} = £\ 3,24,886.29$$

Invest @ 5% p.a. for 3 months

(£ 3,24,886.29 + (3,24,886.29 × 5% × 3/12) = £ 3,28,947.37

Repayment in $ after 3 months [$ 5,00,000 (1.01)] = $ 5,05,000

Buy $ 5,05,000 at 3 months FR [1.5350 + 0.0080] = $/£ 1.5430

Cash outflow in £ $= \frac{\$\ 5,05,000}{£\ 1.5430}$ = £ 3,27,284.51

Gain (£ 3,28,947.37 – £ 3,27,284.51) = £ 1,663

Option 2: Invest in New York

Invest $ 5,00,000 @ 8% p.a. for 3 months

Cash inflows ($) [$ 5,00,000 (1.02)] = $ 5,10,000

Cash outflow $ = $ 5,05,000

Net Gain ($) = $ 5,000

Convert $ 5,000 at 3 months FR

(1.5390 + 0.0085) = 1.5475

Net Gain in £ $= \frac{\$\ 5,000}{1.5475}$ = £ 3,231

Option 3: Invest in Frankfurt

$ Available = $ 5,00,000

Convert $ 5,00,000 at SR $= \frac{\$\ 5,00,000}{1.5390}$ = £ 3,24,886.2

Convent £ 3,24,886 at in € at SR €/£ - 1.8260

(£ 3,24,886 × 1.8260) = € 5,93,242

Invest € 5,93,242 @ 8% p.a. for 3 months

(€ 5,93,242 × 1.0075) = € 5,97,691

Convert € 5,97,691 in £ at 3 months FR

(1.8290 – 0.0140) = €/£ 1.8150

$= \frac{\$\ 5,97,691}{1.8150}$ = £ 3,29,306

Buy $ 5,05,000 at FR

Gain = £ 3,29,306 – £ 3,27,285

= £ 2,021

Invest in New York is the best option due to highest gain.

Question – 67

ICL an Indian MNC is executing a plant in Sri Lanka. It has raised ₹ 400 billion. Half of the amount will be required after six months' time. ICL is looking an opportunity to invest this amount on 1st April, 2020 for a period of six months. It is considering two underlying proposals:

Market	Japan	US
Nature of Investment	Index Fund (JPY)	Treasury Bills (USD)
Dividend (in billions)	25	-
Income from stock lending (in billions)	11.9276	-
Discount on initial investment at the end	2%	-
Interest	-	5 per cent per annum
Exchange Rate (1st April, 2020)	JPY/INR 1.58	USD/INR 0.014
Exchange Rate (30th September, 2020)	JPY/INR 1.57	USD/INR 0.013

You, as an Investment Manager, is required to suggest the best course of option.

(Exam November – 2020) (12 Marks)

Solution:

Option 1: Investment in japan (index fund)

Fund available (₹ 400 billions × 50%) = ₹ 200 billions

Convert ₹ 200 billions in ¥ at SR

₹ 200 billions × 1.58 = ¥ 316 billions

Investment value after 6 months

Index fund (¥ 316 × 98%)	= ¥ 309.68 billions
(+) Dividend	= ¥ 25 billions
(+) Stock lending income	= ¥ 11.9276 billions
	¥ 346.6076 billions

Convert ¥ into ₹ at FR

$\frac{¥\ 346.6076}{1.57}$ = ₹ 220.7692 billions

Income = ₹ 220.7692 – ₹ 200 = 20.7692 billions

Option 2: Investment in US [T. Bill]

Amount available = ₹ 200 billions

Convert ₹ 200 billions in $ at SR

₹ 200 × 0.014 = $ 2.80 billions

Investment value after 6 months

$ 2.80 × (1.025) = $ 2.87 billions

Convert $ 2.87 billions in ₹ at FR

$\frac{\$\ 2.87}{0.013}$ = ₹ 220.7692

Income = ₹ 220.7692 – 200 = ₹ 20.7692 billions

- The equivalent amount is same in both the options so ICL is indifferent.
- However, USD is more stable, and Treasury Bills are risk free, so investment in Treasury Bills (USD) is suggested.

Question – 68

(i) Interest rates for 3 months in USA and Canada are as follows:

Currency	Borrow	Invest
US $	4%	2.5%
Canadian $	4.5%	3.5 %

(ii) Can $/ US $ spot 1.235 ---- 1.240

3 months forward 1.255 ---- 1.260

Advice, the currency in which borrowing and lending for 3 months needs to be done for the US company. Take 3 months = 90/360 days.

(Exam Jan – 2021) (8 Marks)

Solution:

Assume $ 1,000

Lending

Option 1: Lending in US

Principal	$ 1,000.00
(+) Interest ($ 1,000 × 2.5% × 90/360)	$ 6.25
	$ 1,006.25

Option 2: Lending in Canada

Convert $ 1,000 in Can $ at SR

$ 1,000 × 1.235	C$ 1,235
Interest (1,235 × 3.5% × 90/360)	C$ 10.80
	C$ 1,245.80

Convert C$ 1,245.80 in US $ at FR

$$\frac{\text{Can \$ 1,245.80}}{1.260} = \$\ 988.74$$

Lending in US is better due to higher cash inflows.

Borrowing

Option -1 Borrow from US

Borrowing amount	=	$ 1,000
Interest ($ 1,000 × 4% × 90/360)		$ 10
		$ 1,010

Option -2 Borrowing from Canada

Can $ required to buy US $ 1,000

$ 1,000 × 1.240	C$ 1,240

Interest (C$ 1,240 × 4.5% × 90/360)	C$ 13.95
	C$ 1,253.95

Buy C$ 1,253.95 at FR

$$\frac{\text{Can \$ } 1{,}253.95}{1.255} = \$\ 999.16$$

Borrow from Canada is better due to lower cash outflows.

(11) INTERNATIONAL CASH MANAGEMENT

Question – 69

Suppose you are a treasurer of XYZ plc in the UK. XYZ have two overseas subsidiaries, one based in Amsterdam and one in Switzerland. The Dutch subsidiary has surplus Euros in the amount of 725,000 which it does not need for the next three months but which will be needed at the end of that period (91 days). The Swiss subsidiary has a surplus of Swiss Francs in the amount of 998,077 that, again, it will need on day 91. The XYZ plc in UK has a net balance of £75,000 that is not needed for the foreseeable future.

Given the rates below, what is the advantage of swapping Euros and Swiss Francs into Sterling?

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

Interest rates for the Deposits

Amount of Currency	91 Days Interest Rate % p.a.		
	£	€	CHF
0 – 1,00,000	1	¼	0
1,00,001 – 5,00,000	2	1 ½	¼
5,00,001 – 10,00,000	4	2	½
Over 10,00,000	5.375	3	1

Solution:

Option 1: [Individual basis] assume 1 year = 360

Without swapping		Individuals basis			
Curre -ncy	Principal	Interest	Total	Calculation of interest in £	6 months
£	£ 75,000	£ 75,000 × 1% × 91/360	₹ 75,189.58	---	£ 75,189.58
€	€ 7,25,000	£ 7,25,000 × 2% × 91/360	€ 7,28,665.28	€ 7,28,665.28 × 0.6895	£ 5,02,414.71
CHF	CHF 9,98,077	9,98,077 × 2% × 91/360	CHF 9,99,338.46	9,99,338.46 / 2.3098	£ 4,32,651.51
					£ 10,10,255.80

Option 2: Swapping

Available £ in UK = £ 75,000

Convert € in £ at SR (€ 7,25,000 × 0.6858) = £ 4,97,205

Convert CHF in £ at SR $\left(\frac{9,98,077}{2.3326}\right)$ = £ 4,27,881.76

= £ 10,00,086.76

Invest £ at 5.375% for 91 days

Interest = £ 10,00,086.76 × 5.375% × 91/360

= £ 13,587.98

Total = £ 10,00,086.76 + £ 13,587.98

= £ 10,13,674.74

Swapping is better due to higher cash inflows.

(12) FX SWAP

Question – 70

Drilldip Inc. a US based company has a won a contract in India for drilling oil field. The project will require an initial investment of ₹ 500 crore. The oil field along with equipments will be sold to Indian Government for ₹ 740 crore in one year time. Since the Indian Government will pay for the amount in Indian Rupee (₹) the company is worried about exposure due exchange rate volatility.

You are required to:

(a) Construct a swap that will help the Drilldip to reduce the exchange rate risk.

(b) Assuming that Indian Government offers a swap at spot rate which is 1US$ = ₹ 50 in one year, then should the company should opt for this option or should it just donothing. The spot rate after one year is expected to be 1US$ = ₹ 54. Further you may also assume that the Drilldip can also take a US$ loan at 8% p.a.

(SM TYK – 50)

Solution:

(a) Drilldip will enter into buy sell swap in which Drilldip will buy ₹ 500 cr now & sell ₹ 500 cr after 1 year.

Option 1 FX Swap	**$**
Buy ₹ 500 Cr. today $\left(\frac{₹\ 500\ cr}{₹\ 50}\right)$	= (10 Cr.)
Sell ₹ 500 Cr. after 1 year $\left(\frac{₹\ 500\ cr}{₹\ 50}\right)$	= 10 Cr.
Sell ₹ 240 Cr. at 1 year expected rate $\left(\frac{₹\ 240}{54}\right)$	= 4.444 Cr.
Interest ($ 10 Cr. × 8%)	= (0.8 Cr.)
Profit	= $ 3.644 Cr.

Option 2 Do Nothing	
Buy 500 Cr. today at SR $\left(\frac{₹\ 500\ cr}{₹\ 50}\right)$	= (10Cr.)
Sell 740 Cr. at expected SR $\left(\frac{₹\ 740\ cr}{₹\ 54}\right)$	= 13.704
Interest	= (0.8 Cr.)
Profit	= $ 2.904 Cr.

FX Swap is better due to higher profit.

(13) ECONOMIC EXPOSURE

Question – 71

M/s Omega Electronics Ltd. exports air conditioners to Germany by importing all the components from Singapore. The company is exporting 2,400 units at a price of Euro 500 per unit. The cost of imported components is S$ 800 per unit. The fixed cost and other variables cost per unit are ₹ 1,000 and ₹ 1,500 respectively. The cash flows in Foreign currencies are due in six months. The current exchange rates are as follows:

₹/Euro	51.50/55
₹/S$	27.20/25

After six months the exchange rates turn out as follows:

₹/Euro	52.00/05
₹/S$	27.70/75

(A) You are required to calculate loss/gain due to transaction exposure.

(B) Based on the following additional information calculate the loss/gain due to transaction and operating exposure if the contracted price of air conditioners is ₹ 25,000 :

(i) the current exchange rate changes to

₹/Euro	51.75/80
₹/S$	27.10/15

(ii) Price elasticity of demand is estimated to be 1.5

(iii) Payments and receipts are to be settled at the end of six months.

(SM TYK – 48)

Solution:

(A) Calculation of Transaction Exposure

Current Exchange rate

(2,400units × € 500 × 51.50) – (2,400 × S$ 800 × 27.25) – (2,400 × 2,500)

= ₹ 34,80,000

6 Months Exchange rate

(2,400 units × € 500 × 52) – (2,400 × S$ 800 × 27.75) – (2,400 × 2,500)

= ₹ 31,20,000

Loss due to Exposure

₹ 34,80,000 – ₹ 31,20,000 = ₹ 3,60,000

(B) If current exchange rate change then calculation of loss due to Transaction Exposure

Current exchange rate

(2,400 units × 25,000) – (2,400 × S$800 × 27.15) – (2,400 × 2,500)

= ₹ 18,72,000

6 Months Exchange rate

(2,400 units × 25,000) – (2,400 × S$800 × 27.75) – (2,400 × 2,500)

= ₹ 7,20,000

Loss due to Transaction Exposure = ₹ 11,52,000

Calculation of new demand of units

Price of unit of German customer at old rate

$$\frac{₹\ 25,000}{51.50} = € 485.44$$

Price of unit at new exchange rate

$$\frac{₹\ 25,000}{51.75} = € 483.09$$

$$\% \text{ decrease in price} = \frac{€\ 485.44 - €483.09}{€\ 485.44} \times 100 = 0.48\%$$

% Increase in demand = 0.48 × 1.5 = 0.72%

New units = 2,400 × 0.72% = 17 Units

Total Unit = 2,400 + 17 = 2,417 unit

Profit due to increase in new unit 6 month

(2,417 units × 25,000) – (2,417 × S$ 800 × 27.75) – (2,400 × 1,000) – (2417 × 1,500)

= 7,42,100

Loss due to economics exposure = 18,72,000 – 7,42,100

= 11,29,900

(14) NDF CONTRACT

Question – 72

On 1st February 2020, XYZ Ltd. a laptop manufacturer imported a particular type of Memory Chips from SKH Semiconductor of South Korea. The payment is due in one month from the date of Invoice, amounting to 1190 Million South Korean Won (SKW). Following Spot Exchange Rates (1st February) are quoted in two different markets:

USD/ INR 75.00/ 75.50 in Mumbai

USD/ SKW 1190.00/ 1190.75 in New York

Since hedging of Foreign Exchange Risk was part of company's strategic policy and no contract for hedging in SKW was available at any in-shore market, it approached an off-shore Non Deliverable Forward (NDF) Market for hedging the same risk.

In NDF Market a dealer quoted one-month USD/ SKW at 1190.00/1190.50 for notional amount of USD 100,000 to be settled at reference rate declared by Bank of Korea.

After 1 month (1st March 2020) the dealer agreed for SKW 1185/ USD as rate for settlement and on the same day the Spot Rates in the above markets were as follows:

USD/ INR 75.50/ 75.75 in Mumbai

USD/ SKW 1188.00/ 1188.50 in New York

Analyze the position of company under each of the following cases, comparing with Spot Position of 1st February:

(i) Do Nothing.

(ii) Opting for NDF Contract. Note: Both Rs./ SKW Rate and final payment (to be computed in Rs. Lakh) to be rounded off upto 4 decimal points. (10 Marks)

(MTP April – 2021)

Solution:

At Spot Rate

If SKS 1,190 million today

₹/$ = 75.50

SKW/$ = 1,190

₹/SKW $= 75.50 \times \frac{1}{1190}$

$= 0.0634$

SKW 1,190 × 0.0634

= ₹ 75.446 m

= ₹ 754.46 lacs

Option 1: Do Nothing

Buy SKW 1,190 millions at 1 months SR

₹/$ = 75.50

SKW/$ = 1188

₹/SKW $= 75.50 \times \frac{1}{1,188}$

$= 0.0638$

SKW 1,190 millions × 0.0638 = 75.922 millions

= 75.922 lacs

Loss = 759.22 – 754.46 = 4.76 lacs

Option 2: NDF Contract

Since SKW payable & we afraid from SKW rising but we have to take position on $, hence we should take short position (sell) on $ at SKW/$ 1,190

$$\text{Amount of short position (\$)} = \frac{\text{SKW 1,190 m}}{1,190} = \$\ 1\text{million}$$

$$= \text{or } \$\ 10,00,000$$

Gain or Loss

On maturity, SKW/$ is 1,185 hence gain on short position

(SKW 1,190 – SKW 1,185) × $ 10,00,000 = $ SKW 50,00,000

$$\text{Gain in \$} = \frac{\text{SKW 50,00,000}}{1,185} = \$\ 4,219.4093$$

Buy SKW 1190 millions at 1 month SR = ₹ 759.22 lacs

(-) Sell $ 4,219.4093 at 1 month SR
($ 4,219.4093 × 75.50) = ₹ 3.1856 lacs

= ₹ 756.0343 lacs

Loss = ₹ 756.0343 – 754.46 = 1.5743 lacs

NDF contract is better due to less loss.

(15) RESIDUAL

Question – 73

M/s. Sky products Ltd., of Mumbai, an exporter of sea foods has submitted a 60 days bill for EUR 5,00,000 drawn under an irrevocable Letter of Credit for negotiation. The company has desired to keep 50% of the bill amount under the Exchange Earners Foreign Currency Account (EEFC). The rates for ₹/USD and USD/EUR in inter-bank market are quoted as follows:

	₹/ USD	USD/EUR
Spot	67.8000 – 67.8100	1.0775 – 1.8000
1 month forward	10/11 Paise	0.20/0.25 Cents
2 months forward	21/22 Paise	0.40/0.45 Cents
3 months forward	32/33 Paise	0.70/0.75 Cents

Transit Period is 20 days. Interest on post shipment credit is 8% p.a.

Exchange Margin is 0.1%. Assume 365 days in a year.

You are required to calculate:

(i) Exchange rate quoted to the company

(ii) Cash inflow to the company

(iii) Interest amount to be paid to bank by the company.

(Exam January – 2021) (8 Marks)

Solution:

(i) Exchange rate quoted to the company

60 pay FR	
$/€	1.0775
(+) 2 months swap	0.0040
$/€	1.0815
₹/$	67.8000
(+) 2 months swap	0.2100
	₹ 68.0100
(-) margin	- 0.1%
	₹ 67.9420

₹/€ = ₹ 67.9420 × 1.0815

= ₹ 73.4793

(ii) Cash inflow = € 2,50,000 × 73.4793

= ₹ 1,83,69,825

(iii) Interest on post shipment credit

₹ 1,83,69,825 × 8% × 80/365 = ₹ 3,22,101

Question – 74

ABC Ltd. of UK has exported goods worth Can $ 5,00,000 receivable in 6 months. The exporter wants to hedge the receipt in the forward market. The following information is available:

Spot Exchange Rate	Can $ 2.5/£
Interest Rate in UK	12%
Interest Rate In Canada	15%

The forward rates truly reflect the interest rates differential. Find out the gain/loss to UK exporter if Can $ spot rates (i) declines 2%, (ii) gains 4% or (iii) remains unchanged over next 6 months.

(SM TYK – 04)

Solution:

Calculation of FR

$$FR = SR_A \times \frac{1 + r_A}{1 + r}$$

$$= C\$\ 2.5 \times \frac{1.075}{1.06}$$

C$/£ = C$ 2.535

Gain/Loss

(i) C$ decline by 2 % (2.5 × 1.02) = 2.55

Receivable under FC	$= \frac{C\$\ 5,00,000}{2.535}$	= £ 1,97,238.66
Receivable under	$= \frac{C\$\ 5,00,000}{2.55}$	= £ 1,96,078.43
Gain		= £ 1,160.23

(ii) C$ gain by 4% [2.5 × 0.96 = 2.40]

Forward cover	$ 1,97,238.66

	Expected SR $\left(\frac{\text{C\$ 5,00,000}}{2.40}\right)$	$ 2,08,333.33
	Loss	$ 11,094.67

(iii) Remains unchanged

	Forward cover	$ 1,97,238.66
	Expected SR $\left(\frac{\text{C\$ 5,00,000}}{2.5}\right)$	$ 2,00,000
	Loss	$ 2,761.34

Question – 75

Your forex dealer had entered into a cross currency deal and had sold US $ 10,00,000 against EURO at US $ 1 = EURO 1.4400 for spot delivery.

However, later during the day, the market became volatile and the dealer in compliance with his management's guidelines had to square – up the position when the quotations were:

Spot US $ 1	INR 31.4300/4500
1 month margin	25/20
2 months margin	45/35
Spot US $ 1	EURO 1.4400/4450
1 month forward	1.4425/4490
2 months forward	1.4460/4530

What will be the gain or loss in the transaction?

(SM TYK – 46)

Solution:

Gain/loss in €

Selling rate	= € 1.4400
Buying rate	= € 1.4450
Loss	= € 0.0050 per $

(×) Contract size = $ 10,00,000

Loss = € 5,000

Loss in ₹ (Ask Rate)

₹/€ $= 31.4500 \times \frac{1}{1.4400}$

$= 21.8403$

= € 5,000 × 21.8403

= ₹ 1,09,201

Question – 76

Following are the details of cash inflows and outflows in foreign currency denominations of MNP Co. an Indian export firm, which have no foreign subsidiaries:

Currency	Inflow	Outflow	Spot Rate	Forward Rate
US $	4,00,00,000	2,00,00,000	48.01	48.82
French Franc (FFr)	2,00,00,000	80,00,000	7.45	8.12
U.K. £	3,00,00,000	2,00,00,000	75.57	75.98
Japanese Yen	1,50,00,000	2,50,00,000	3.20	2.40

(i) Determine the net exposure of each foreign currency in terms of Rupees.

(ii) Are any of the exposure positions offsetting to some extent?

(SM TYK – 10)

Solution:

(i) Net exposure of each foreign currency in ₹

Currency	Net inflow	Spread	Net exposure
$	2,00,00,000	0.81	1,62,00,000
FFr	1,20,00,000	0.67	80,40,000
£	1,00,00,000	0.41	41,00,000
¥	-1,00,00,000	-0.80	80,00,000

(ii) In Japanese Yen, the exposure is payable, and the forward rate is quoted at a discount, effectively offsetting the position. Likewise, in the remaining currencies, the net exposures are in receivables, and the

related currencies are at a premium, offsetting the positions in their respective currencies.

ADDITIONAL QUESTIONS

Question – 01

Mr. H as Treasure for your bank working under you sold HK$ 10 million value Spot to your customer at ₹ 10.55/ HK$ and covered yourself in the London market on the same day when the exchange rates were:

US$ 1 = HK$ 7.8880 / 7.8920

Local interbank market rates for US$ were:

Spot US$ 1 = ₹ 82.70 / 82.85

Required:

(i) Calculate Cover Rate

(ii) Calculate Profit or loss in the transaction

(iii) Do you agree with the views of the Internal Auditor that Mr. H has a speculative nature?

Note: Ignore brokerage.

(MTP September – 2024)

Solution:

(i) Rupee – Dollar Selling Rate: = ₹ 82.85

Dollar – Hong Kong Dollar Buying Rate: = H.K.$ 7.8880

Hong Kong Dollar (Selling) Cross Rate: = ₹ 82.85 / 7.8880

= ₹ 10.5033

(ii) Profit / Loss to the Bank

Amount received from customer (HK$ 10 million × 10.55)	₹ 10,55,00,000
Amount paid on cover deal (HK$ 10 million × ₹ 10.5033)	₹ 10,50,33,000