

FOREIGN EXCHANGE RISK MANAGEMENT

Question 1.

(i) Explain the term "Foreign Exchange Rate Risk".

(ii) Mention any four tools available to cover Exchange Rate Risk.

(iii) Alert Ltd. is planning to import a multi-purpose machine from Japan at a cost of 3,400 lakhs yen. The company can avail **Rupee** loans at 18% interest per annum with quarterly rests with which it can import the machine.

Alternatively, there is an offer from Tokyo branch of an India based bank extending credit of 180 days at 2% per annum interest against opening of an irrevocable letter of credit.

Other Information:

Present exchange rate Rs. 100 = 340 yen.

180 days' forward rate Rs. 100 = 345 yen.

Commission charges for letter of credit at 2% per 12 months. Assume that commission is payable in advance **& co. will have to borrow money in Indian rupees @18% p.a. compounded quarterly to pay that commission.**

Advise whether the co. should avail loan or accept the offer from Tokyo branch of India based bank.

Hint: on opening of letter of credit an importer has to make payment of following charges:

1) Commission or opening fees, which is normally payable in advance.

2) Interest, which is added to the amount of Letter of credit hence payable at the end.

(4 + 4 + 12 = 20 marks) (November, 1996)

Question 2

Write short notes on:

(a) Cross Currency Roll Over Contracts. (5 marks) (May 1997)

Question 3 :

Write short on Forward as hedge instrument. (5 marks) (November, 1997)

Question 4

Write short note on Debt route for foreign exchange funds. (5 marks) (May 2000)

Question 5

The following table shows interest rates for the United States dollar and French francs. The spot exchange rate is 7.05 francs per dollars. Complete the missing entries:

	3 Months	6 Months	1 Year
Dollar interest rate (annually compounded)	11 ^{1/2} %	12 ^{1/4} %	?
Franc interest rate (annually compounded)	19 ^{1/2}	?	20%
Forward franc per dollar	?	?	7.5200
Forward discount per franc per cent per year	?	- 6.3%	

(8 marks) (November, 2000)

Bombay US\$1	= Rs. 45.85/45.90	45.91/45.97
London Pound 1	US\$ 1.7840/1.7850	1.7765/1.7775
Pound 1	=SGD3.1575/3.1590	3.1380/3.1390

The bank wishes to retain an exchange margin of 0.125%. How much does the customer stand to gain or lose due to the delay? (Calculate rate in multiples of .0001)
(8 Marks) (May 2005)

Question 11

You as a dealer in foreign exchange have the following position in Swiss Francs on 31st October, 2004:

	Swiss Francs
Balance in the Nostro A/c Credit (Deposit)	1,00,000
Opening Position Overbought	50,000
Purchased a bill on Zurich	80,000
Sold forward TT	60,000
Forward purchase contract cancelled	30,000
Remitted (sold) by TT	75,000
Draft on Zurich cancelled	30,000

What steps would you take, if you are required to maintain a credit Balance of Swiss Francs 30,000 in the Nostro A/c and keep as overbought position on Swiss Francs 10,000?
(7 Marks) (November, 2005)

Question 12

You sold Hong Kong Dollar 1,00,00,000 value spot to your customer at Rs. 5.70 & covered yourself in London market on the same day, when the exchange rates were:

US\$1 = H.K.\$ 7.5880/7.5920

Local interbank market rates for US\$ were Spot US\$ 1 = Rs. 42.70/42.85

Calculate cover rate & ascertain the profit or loss in the transaction ignore brokerage.

(4 Marks) (November, 2005)

Question 13

Given the following information:

Exchange rate — Canadian dollar 0.665 per DM (spot)

Canadian dollar 0.670 per DM (3 months)

Interest rates — DM 7% p.a.

Canadian Dollar 9% p.a.

What operations would be carried out to take the possible arbitrage gains?

(8 Marks) (May, 2006)

Question 14

XYZ Ltd. is an export oriented business house based in Mumbai. The Company invoices in customers' currency. Its receipt of US \$ 1,00,000 is due on September 1, 2005.

Market information as at June 1, 2005.

Exchange Rates

US \$/Rs.	
Spot	0.02140
1 Month Forward	0.02136
3 Months Forward	0.02127

Currency Futures

US \$/Rs.	(Contract size Rs.4,72,000)
June	0.02126
September	0.02118

	Initial Margin	Interest Rates in India
June	Rs.10,000	7.50%
September	Rs.15,000	8.00%

On September 1, 2005 the spot rate of US\$/Re. is 0.02133 and currency future rate is ~~0.2134~~ 0.02134. Comment which of the following methods would be most advantageous for XYZ Ltd.

- Using forward contract
- Using currency futures (**You can solve this part only after studying Derivatives**)
- Not hedging currency risks.

It may be assumed that variation in margin would be settled on the maturity of the futures contract. (10 Marks) (November. 2006)

Question 15

Spot rate 1 US \$ = Rs.48.0123 .

180 days Forward rate for 1 US\$ = Rs.48.8190 .

Annualized interest rate for 6 months — Rupee = 12%

Annualized interest rate for 6 months — US \$ = 8%

Is there any arbitrage possibility? If yes how an arbitrageur can take advantage of the situation, if he is willing to borrow Rs.40,00,000 or US \$83,312.

(5 Marks) (November 2006)

Question 16

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	Out flow	Spot rate	Forward rate
US \$	4,00,00,000	2,00,00,000	48.01	48.82
French France (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

Determine the net exposure **expected gain or loss** of each foreign currency in terms of Rupees.

Hint: Assume all the spot, forward rates to be direct quote in India. (Though the last quote is not reliable)

(4 marks) (November 2006)

Question 17

XYZ Ltd. A US firm will need £3,00,000 in 180 days. In this connection, the following information is available:

Spot Rate £1 = \$2.00

180 days forward rate of £ as of today = \$1.96

Interest rates are as follows:

	UK	US
180 days deposit rate	4.5%	5%
180 days borrowing rate	5%	5.5%

(Note: you should assume that these interest rates are given for the period of 180 days and not per annum)

A call option on pound that expires in 180 days has an exercise price of \$1.97 and a premium of \$0.04. XYZ Ltd. Has forecast the spot rates 180 days hence as below:

Future rate	Probability
\$1.91	25%

\$1.95	60%
\$2.05	15%

Which of the following strategies would be most preferable to XYZ Ltd.?

- (a) a forward contract
- (b) a money market hedge
- (c) an option contract **(You can solve this part only after studying Derivatives)**
- (d) no hedging

show calculation in each case. (8 marks)(May-2007)

Question 18

AMK Ltd. An India based company has subsidiaries in U.S. and U.K.

Forecasts of surplus funds for the next 30 days from two subsidiaries are as below:

U.S.	\$12.5 million
U.K.	£6 million

Following exchange rate information are obtained:

	\$/Rs.	£/Rs.
Spot	0.0215	0.0149
30 days forward	0.0217	0.0150

Annual borrowing/deposit rates (simple) are available.

Rs.	6.4%/6.2%
\$	1.6%/1.5%
£	3.9%/3.7%

The Indian operation is forecasting a cash deficit of Rs.500 million. It is assumed that interest rates are based on a year of 360 days.

- (I) Calculate the cash balance at the end of 30 days period in Rs. for each company under each of the following scenarios ignoring transaction costs and taxes:
 - (a) Each company invest/finances its own cash balances/deficits in local currency independently.
 - (b) Cash balances are pooled immediately in India and the net balances are invested/borrowed for the 30 days period.

- (II) Which method do you think is preferable from the parent company's point of view?

(8 marks) (May 2007)

Question 19

Following information relates to AKC Ltd. Which manufactures some part of an electronic device which are exported to USA, Japan, Europe on 90 days credit terms.

Cost and sales information:	Japan	USA	Europe
Variable cost per unit	Rs.225	Rs.395	Rs.510
Export Sales price per unit	Yen 650	US\$10.23	Euro 11.99
Receipts from sale due in 90 days	Yen 78,00,000	US \$ 1,02,300	Euro 95,920

Foreign Exchange Rate Information:

	Yen/Rs.	US\$/Rs.	Euro/Rs.
Spot Market	2.417-2.437	0.0214-0.0217	0.0177-0.0180
3 months forward	2.397-2.427	0.0213-0.0216	0.0176-0.0178
3 months spot	2.423-2.459	0.02144-0.02156	0.0177-0.0179

Advice AKC Ltd. By calculating average contribution to sales ratio whether it should hedge its foreign currency risk or not. (8 marks) (Nov 2007)

Question 20

(b) A company is considering hedging its foreign exchange risk. It has made a purchase on 1st January, 2008 for which it has to make a payment of USD 50,000 on September 30, 2008. The Present Exchange rate is \$1 = Rs.39. ~~The company will have to make an upfront premium of 2% of the forward amount purchased.~~ **Forward premium is 2% of the spot rate and the company will have to make upfront payment of the premium amount.** The cost of fund to the company is 10% per annum and the rate of Corporate tax is 50%. Ignore taxation. Consider the following situations and compute the profit/loss the company will make if it hedges its foreign exchange risk:

- (i) If the exchange rate on September 30, 2008 is Rs.42 per US\$.
 (ii) If the exchange rate on September 30, 2008 is Rs.38 per US\$. (8 marks) (May 2008)
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Question 21 (Nov 2008) (6 Marks) Letter of credit

(a) Sun Ltd. in planning to import an equipment from Japan at a cost of 3,400 lakh yen. The company may avail loans at 18 per cent per annum with quarterly rests with which it can import the equipment. The company has also an offer from Osaka branch of an India based bank extending credit of 180 days at 2 per cent per annum against opening of an irrecoverable letter of credit.

Additional information :

Present exchange rate Rs.100 = 340 yen

180 day's forward rate Rs.100 = 345 yen

Commission charges for letter of credit at 2 per cent per 12 months.

Advise the company whether the offer from the foreign branch should be accepted.

Hint: on opening of letter of credit an importer has to make payment of following charges:

- 1) Commission or opening fees, which is normally payable in advance.
 - 2) Interest, which is added to the amount of Letter of credit hence payable at the end.
 - 3) Assume that company will have to borrow money in Indian rupees @18%p.a. compounded quarterly to pay the advance commission.
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Question 22 (Nov 2008 Old) (6 Marks) cross currency arbitrage

(a) Followings are the spot exchange rates quoted at three different forex markets :

USD/INR 48.30 in Mumbai

GBP/INR 77.52 in London

GBP/USD 1.6231 in New York

The arbitrageur has USD1,00,00,000. Assuming that there are no transaction costs, explain whether there is any arbitrage gain possible from the quoted spot exchange rates.

Question 23 (Nov-2008 New) (6 Marks) MMH & IRP

(a) An exporter is a UK based company. Invoice amount is \$3,50,000. Credit period is three months. Exchange rates in London are :

Spot Rate (\$/£) 1.5865 – 1.5905

3-month Forward Rate (\$/£) 1.6100 – 1.6140

Rates of interest in Money Market :

	Deposit	Loan
\$	7%	9%
£	5%	8%

Compute and show how a money market hedge can be put in place. Compare and contrast the outcome with a forward contract.

(b) An Indian exporting firm, Rohit and Bros., would be covering itself against a likely depreciation of pound sterling. The following data is given:

Receivables of Rohit and Bros : £500,000

Spot rate : Rs.56.00/£

Payment date : 3-months

3 months interest rate : India : 12 per cent per annum
: UK : 5 per cent per annum

What should the exporter do ?

Question 24 (Nov 2008 New) (4 Marks) IRP & PPP

- (i) The rate of inflation in USA is likely to be 3% per annum and in India it is likely to be 6.5%. The current spot rate of US \$ in India is Rs.43.40. Find the expected rate of US \$ in India after one year and 3 years from now using purchasing power parity theory. (4 Marks)
- (ii) On April 1, 3 months interest rate in the UK £ and US \$ are 7.5% and 3.5% per annum respectively. The UK £/US \$ spot rate is 0.7570. What would be the forward rate for US \$ for delivery on 30th June ?
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Question 25 (June 2009 Old) (6 Marks) Leading & Lagging

The following 2 way quote appear in the foreign exchange market:

	Spot	2-Months Forward
Rs./US\$	Rs.46.00/Rs.46.25	Rs.47.00/Rs.47.50

Required:

- (i) How many US dollars should a firm sell to get Rs.25 Lakhs after 2 months?
- (ii) How many Rupees is the firm required to pay to obtain US \$2,00,000 in the spot market?
- (iii) Assume the firm has US \$ 69000 in current account earning no interest. ROI on rupee investment is 10% p.a. Should the firm en-cash the US\$ now or 2 months later?
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Question 26 (June 2009 New) (6 Marks) Cross Currency

(a) Your forex dealer had entered into a cross currency deal and had sold US \$ 10,00,000 against EURO at US \$ 1 = EUR 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?

(c) You have following quotes from Bank A and Bank B: **(Cross Currency)**

	Bank A	Bank B
SPOT	USD/CHF 1.4650/55	USD/CHF 1.4653/60
3 months	5/10	
6 months	10/15	
SPOT	GBP/USD 1.7645/60	GBP/USD 1.7640/50
3 months	25/20	
6 months	35/25	

Calculate :

- (i) How much minimum CHF amount you have to pay for 1 Million GBP spot?
- (ii) Considering the quotes from Bank A only, for GBP/CHF what are the Implied Swap points for Spot over 3 months? (6 Marks) (June 2009 New)
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Question 27 (Nov 09 Old) (7 marks) Hedging

An exporter is a UK based company. Invoice amount is \$3,50,000. Credit period is three months. Exchange rates in London are :

Spot Rate (\$/£) 1.5865 – 1.5905

3-Months Forward Rate (\$/£) 1.6100 – 1.6140

Rate of Interest in Money Market :

	Deposit Loan	
\$	7%	9%
£	5%	8%

Compute and show how a money-market hedge can be put in place. Compare and contrast the outcome with a forward contract.

Question 28 May 2010 Old) (8 marks) Hedging

A Ltd. of U.K. has imported some chemical worth of USD 3, 64,897 from one of the U.S. suppliers.

The amount is payable in six months time. The relevant spot and forward rates are:

Spot rate USD 1.5617- 1.5673

6 months forward rate USD 1.5455 – 1.5609

The borrowing rates in U.K. and U.S. are 7% and 6% respectively and the deposit rates are 5.5% and 4.5% respectively.

Currency option is available under which one option contract is for GBP 12,500. The option premium for GBP at a strike price of USD 1.70/GBP is USD 0.037 (call option) and USD 0.096 (put option) for 6 months period.

The company has 3 choices:

- (i) Forward cover
 - (ii) Money market cover, and
 - (iii) Currency option (can do it only after studying derivatives.)
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Question 29 (May 2010 Old) (4 marks) PPP

The rate of inflation in India is 8% per annum and in the U.S.A. it is 4%. The current spot rate for USD in India is Rs. 46. What will be the expected rate after 1 year and after 4 years applying the Purchasing Power Parity Theory.

Question 30 (Nov 2010 Old) (4 marks) Extension

An importer request his bank to extend the forward contract for US \$ 20,000 which is due for maturity on 30th October, 2010, for a further period of 3 months. He agrees to pay the required margin money for such extension of the contract.

Contracted Rate – US \$ 1 = ` 42.32

The US Dollar quoted on 30.10.2010 :-

Spot – 41.5000 / 41.5200

3 month's premium – 0.87% / 0.93%

Margin money for buying and selling rate is 0.075% and 0.20% respectively. Compute :

- (i) The cost to the importer in respect of the extension of the forward contract, and
 - (ii) The rate of new forward contract.
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Question 31 (Nov 2010 New) (4 marks) IRP

Given the following information:

Exchange rate – Canadian Dollar 0.666 per DM (spot)

Canadian Dollar 0.671 per DM (3 months)

Interest rate – DM 8% p.a.

Canadian Dollar 10% p.a.

What operations would be carried out to earn the possible arbitrage gains?

Question 32 (Nov 2011) (5 marks) cross currency

An importer is due to pay the exporter on 28th January 2010, Singapore Dollars of 25,00,000 under an irrevocable letter of credit. It directed the bank to pay the amount on the due date.

Due to go-slow and strike procedures adopted by its staff, the bank was not in a position to remit the amount due. The amount was actually remitted on 4th February 2010.

On the transaction, the bank wants to retain an exchange margin of 0.125 per cent.
The following were the rates prevalent in the exchange market on the relevant dates:

	28 th January	4 th February
Rupees/US \$1	`45.85/45.90	`45.91/45.97
London Pound/Dollars	\$ 1.7840/1.7850	\$ 1.7765/1.7775
Pound	Sing \$ 3.1575/3.1590	Sing \$ 3.1380/3.1390

What is the effect on account of the delay in remittance? Calculate rate in multiples of .0001.

Question 33 (Nov 2011) (8 marks) Home currency invoicing & futures

Nitrogen Ltd. a UK company is in the process of negotiating an order amounting to €4 million with a large German retailer on 6 months credit. If successful, this will be the first time that Nitrogen Ltd has exported goods into the highly competitive German market. The following three alternatives are being considered for managing the transaction risk before the order is finalized.

- Invoice the German firm in Sterling using the current exchange rate to calculate the invoice amount.
- Alternative of invoicing the German firm in € and using a forward foreign exchange contract to hedge the transaction risk.
- Invoice the German first in € and use sufficient 6 months sterling future contracts (to the nearly whole number) to hedge the transaction risk.

Following data is available:

Spot Rate	€ 1.1750 – €1.1770/£
6 months forward premium	0.60-0.55 Euro Cents
6 months future contract is currently trading at	€1.1760/£
6 months future contract size is	£ 62500
Spot rate and 6 months future rate after 6 months	£ 1.1785/£

Required:

- Calculate to the nearest £ the receipt for Nitrogen Ltd, under each of the three proposals. **(4 Marks)**
- In your opinion, which alternatives would you consider to be the most appropriate and the reason therefore? **(4 Marks)**

Question 34 (Nov 2011) (6 marks) Leading & Lagging

An Indian importer has to settle an import bill for \$ 1,30,000. The exporters has given the Indian importer two options:

- Pay immediately without any interest charges.
- Pay after three months with interest at 5 percent per annum.

The importer's bank charges 15 percent per annum on overdrafts. The exchanges rates in the market are as follows:

Spot rate (/\$) :48.35/48.36

3-Months forward rate (/\$) :48.81/48.83

The importer seeks your advice. Give your advice.

Question 35 (May 2012) (8 marks) Leading & lagging

NP and Co. has imported goods for US \$7,00,000. The amount is payable after three months. The company has also exported goods for US \$ 4,50,000 and this amount is receivable in two months. For receivable amount a forward contract is already taken at Rs.48.90

The market rates for Rs. And Dollar are as under:

Spot	Rs. 48.50/70
Two months	25/30 points
Three months	40/45 points

The company wants to cover the risk and it has two options as under:

- To cover payables in the forward market and

- B. To lag receivables by one months and cover the risk only for the net amount. No interest for delaying the receivables is earned. Evaluate both the options if the cost of Rupee Fund is 12%. Which option is preferable?

Note: Assume that points given for two and three months are swap points.

Question 36 (May 12) (4 marks each)

Write short notes on the following:

- Meaning and Advantages on Netting
- Nostro, Vostro and Loro Accounts

Question 37 (Nov 2012) (5 marks) IRP

The US dollar is selling in India at Rs. 55.50. If the interest rate for a 6 months borrowing in India is 10% per annum and the corresponding rate in USA is 4% :

- Do you expect that US dollar will be at a premium or at discount in the Indian Forex Market?
- What will be the expected 6-months forward rate for US dollar in India?
- What will be the rate of forward premium or discount?

Question 38 (Nov 2012) (8 marks) leading & lagging

Z Ltd. importing goods worth USD 2 million, requires 90 days to make the payment. The overseas supplier has offered a 60 days interest free credit period and for additional credit for 30 days an interest of 8% per annum.

The banks of Z Ltd. offer a 30 days loan at 10% per annum and their quote for foreign exchanges is as follows:

	Rs.
Spot 1 USD	56.50
60 days forward for 1 USD	57.10
90 days forward for 1 USD	57.50

You are required to evaluate the following options:

- Pay the supplier in 60 days, or
- Avail the supplier's offer of 90 days credit.

Question 39 (May 2013) (5 marks) cross currency

A Bank sold Hong Kong Dollars 40,00,000 Value spot to its customer at ` 7.15 and covered itself in London Market on the same day, when the exchange rates were :

US\$ = HK\$ 7.9250 7.9290

Local interbank rates for US\$ were:

Spot US\$ 1 = ` 55.00 55.20

you are required to calculate rate and ascertain the gain or loss in the transaction. Ignore brokerage. you have to show the calculation for exchange rate up to four decimal points.

Question 40 (Nov. 2013) (5 marks) cross currency

You, a foreign exchange dealer of your bank, are informed that your bank has sold a T. T. on Copenhagen for Danish Kroner 10,00,000 at the rate of Danish Kroner 1 = ` 6. 5150. You are required to cover the transaction either in London or New York market. The rates on that date are as under:

Mumbai - London	` 74.3000	` 74.3200
London - Mumbai - New York	` 49.2500	` 49.2625

London - Copenhagen	DKK 11.4200	DKK 11.4350
New York - Copenhagen	DKK 07.5670	DKK 07.5840

In which market will you cover the transaction, London or New York, and what will be the exchange profit or loss on the transaction? Ignore brokerages.

Question 41 (Nov. 2013) (8 marks) investment

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 propose 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 centre 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 \$ and Euro are as under :

	London on New York	London on Frankfurt
Spot	1.5350/90	1.8260/90
1 month	15/18	60/55
2 month	30/35	95/90
3 month	80/85	145/140

At which centre, will the investment be made & what will be the net gain (to the nearest pound) to the bank on the invested funds? **maturity amount in terms of US dollars after 3 months.**

Question 42 (Nov. 2013) (4 marks)

XYZ Bank, Amsterdam, wants to purchase Rupees 25 million against £ for funding their Nostro account and they credited LORO account with Bank of London, London.

Calculate the amount of £'s credited. Ongoing inter bank rates are per \$, ` 61.3625/3700 & per £, \$ 1.5260/70.

Question 43 (May 2014) (5 marks) cross currency

The Bank sold Hong Kong dollar 1,00,000 spot to its customer at Rs.7.5681 and covered itself in London market on the same day, when the exchange rates were

US \$ = HK \$ 8.4409 HK \$ 8.4500

Local inter-bank market rates for US \$ were:

Spot US \$ 1 = 62.7128 Rs.62.9624

Calculate the cover rate and ascertain the profit or loss in the transaction.

Ignore brokerage.

Question 44 (May 2014) (8 marks) forward cover + cross currency

JKL Ltd., an Indian company has an export exposure of JPY 10,00,000 Payable August 31, 2014. Japanese Yen (JPY) is not directly quoted against Indian Rupee.

The current spot rates are:

INR/US \$ = Rs.62.22

JPY/US \$ = JPY 102.34

It is estimated that Japanese Yen will depreciate to 124 level and Indian Rupee to depreciate against US \$ to Rs.65.

Forward rates for August 2014 are

INR/US \$ = Rs.66.50

JPY/US \$ = JPY 110.35

Required:

- (i) Calculate the expected loss, if the hedging is not done. How the position will change, if the firm takes forward cover?

(ii) If the spot rates on August 31, 2014 are:

INR/US \$ = Rs. 66.25

JPY/US \$ = JPY 110.85

is the decision to take forward cover justified?

Question 45 (May 2014) (8 marks) cross currency

On January 28, 2013 an importer customer requested a Bank to remit Singapore Dollar (SGD) 2,50,000 under an irrevocable letter of Credit (LC). However, due to unavoidable factors, the Bank could effect the remittances only on February 4, 2013. The inter-bank market rates were as follows:

	January 28, 2013	February 4, 2013
US \$1 =	Rs. 45.85/45.90	Rs. 45.91/45.97
GBP £1 =	US \$ 1.7840/1.7850	Rs. US \$ 41.7765/1.7775
GBP £1 =	SGD 3.1575/3.1590	SGD 3.1380/3.1390

The Bank wishes to retain an exchange margin of 0.125%

Required:

How much does the customer stand to gain or lose due to the delay?

(Note: Calculate the rate in multiples of 0.0001)

Question 46 (Nov 2014) (5 marks) cross currency simple

Edelweiss Bank Ltd. sold Hong Kong dollar 2 crores value spot to its customer at ` 8.025 and covered itself in the London market on the same day, when the exchange rates were US\$ 1 = HK \$ 7.5880- 7.5920

Local interbank market rates for US \$ were

Spot US \$ 1 – ` 60.70-61.00

Calculate the cover rate and ascertain the profit or loss on the transaction. Ignore brokerage.

Question 47 (Nov 2014) (8 marks) Leading & Lagging

(a) Gibraltar Limited has imported 5000 bottles of shampoo at landed cost in Mumbai, of US \$ 20 each. The company has the choice for paying for the goods immediately or in 3 months time. It has a clean overdraft limited where 14% p.a. rate of interest is charged. Calculate which of the following method would be cheaper to Gibraltar Limited.

(i) Pay in 3 months time with interest @ 10% and cover risk forward for 3 months.

(ii) Settle now at a current spot rate and pay interest of the overdraft for 3 months.

The rates are as follow :

Mumbai ` /\$ spot : 60.25-60.55

3 months swap : 35/25

Question 48 (Nov 2014) (4 marks)

What are the risks to which foreign exchange transactions are exposed?

Question 49 (May 2015) (6 marks) Futures

EFD Ltd. is an export business house . The company prepares invoice in customers' currency. Its debtors of US\$. 10,000,000 is due on April 1, 2015.

Market information as at January 1, 2015 is :

Exchange Rates (US\$/INR)	Exchange Rates (US\$/INR)	Currency Futures (US\$/INR)	Currency Futures (US\$/INR)
Spot	0.016667	Contract Size	Rs. 24,816,975
1 month Forward	0.016529	1 month	0.016519
3 months Forward	0.016129	3 months	0.016118

	Initial Margin	Interest rates in India
1 month	Rs. 17,500	6.5%
3 months	Rs. 22,500	7%

On April 1, 2015 the spot rate US\$/INR is 0.016136 and currency future rate is 0.016134.

Which of the following methods would be most advantageous to EFD Ltd.?

1. Using forward contract
 2. Using currency futures
 3. Not hedging the currency risk .
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Question 50 (May 2015) (9 marks) Automatic Cancellation

An importer booked forward contract with his bank on 10th April for USD 200000 due on 10th June @ 64.4000. The bank covered its position in the market at Rs. 64.2800.

the exchange rates for dollar in the interbank market on 10th June and 20th June were :

	10 th June	20 th June
Spot USD 1	63.8000/8200	63.6800/7200
Spot/ June	63.9200/9500	63.8000/8500
July	64.0500/0900	63.9300/9900
August	64.3000/3500	64.1800/2500
September	64.6000/6600	64.4800/5600

Exchange margin 0.10% and interest on outlay of funds @ 12%. The importer requested on 20th June for extension of contract with due date on 10th August.

Rates rounded to 4 decimal in multiples of 0.0025.

On 10th June, bank swaps by selling spot and buying one month forward.

Calculate:

1. Cancellation rate
 2. Amount payable on \$ 2,00,000
 3. Swap Loss
 4. Interest on outlay of funds, if any
 5. New contract rate
 6. Total cost
-

Question 51 (May 2015) (5 marks) Leading & Lagging

DEF Ltd. has imported goods to the extent of US\$ 1 crore. The payment terms are 60 days interest-free credit. For additional credit of 30 days, interest at the rate of 7.75% p.a. will be charged.

The banker of DEF Ltd. has offered a 30 days loan at the rate of 9.5% p.a. Their quote for the foreign exchange is as follows :

Spot rate INR/US\$	62.50
60 days forward rate INR/US\$	63.15
90 days forward rate INR/US\$	63.45

Which one of the following options would be better?

1. Pay the supplier on 60th day and avail bank loan for 30 days.
 2. Avail the supplier's offer of 90 days credit.
-

Question 52 (Nov 2015) (5 marks) Cancellation & Cross Currency

A bank enters into a forward purchase TT covering an export bill for Swiss Francs 1,00,000 at Rs. 32.4000 due on 25th April and covered itself for same delivery in the local inter bank market at Rs. 32.4200.

However on 25th March, exporter sought for cancellation of contract as the tenor of the bill is changed.

In Singapore market, Swiss Francs were quoted against US Dollars as under :

Spot	USD 1 = Sw.Fcs 1.5076/1.5120
One month forward	1.5150/1.5160

Two month forward	1.5250/1.5270
Three month forward	1.5415/1.5445

And in the inter bank market US dollars were quoted as under :

Spot	USD 1 = Rs. 49.4302/.4455
Spot/April	.4100/.4200
Spot/May	.4300/.4400
Spot/June	.4500/.4600

Calculate the cancellation charges payable by the customer if exchange margin required by the bank is 0.10% on buying and selling.

Question 53 (Nov 2015) (5 marks) Forward & Option

XYZ an Indian firm, will need to pay Japanese Yen (JY) 5,00,000 on 30th June. In order to hedge the risk involved in foreign currency transaction, the firm is considering two alternative methods i.e. forward market cover and currency options contract.

On 1st April, following quotations (JY/INR) are made available.

Spot	3 months forward
1.9516/1.9711	1.9726/1.9923

The prices for forex currency option are as follows :

Strike price	JY 2.125
Call option (June)	JY 0.047
Put option (June)	JY 0.098

For excess or balance of JY covered, the firm would use forward rate as future spot rate.

You are required to recommend cheaper hedging alternative for XYZ.

Question 54 (Nov 2015) (8 marks) Forward, MMH & Option

ABC Ltd., a US firm will need Pounds 500000 in 180 days. In this connection, the following information is available :

Spot rate 1 Pound = 2.00 Dollars

180 days forward rate as of today is 1.96 dollars.

Interest rate are as follows :

	US	UK
180 days deposit rate	5.0%	4.5%
180 days borrowing rate	5.5%	5.0%

A call option on Pounds that expires in 180 days has an exercise price of Dollars 1.97 and a premium of Dollars 0.04.

Future Rate	Probability
Dollar 1.91	30%
Dollar 1.95	50%
Dollar 2.05	20%

Which of the following strategies would be cheaper to ABC Ltd. ?

1. Forward Contract
2. A money market hedge
3. A call option contract
4. No Hedging Option

Question 55 (May 2016) (8 marks)

Following information is given:

Exchange rate-

Canadian Dollar 0.666 per DM (spot)

Canadian Dollar 0.671 per DM (3 months)

Interest rate-

DM 7.5% p.a.

Canadian Dollar – 9.5% p.a.

To take the possible arbitrage gains, what operations would be carried out?

FOREIGN EXCHANGE RISK MANAGEMENT

Answer 1:

(i) **Foreign Exchange Rate Risk** : This risk relates to the uncertainty attached to the exchange rates between two currencies. For example, the amount borrowed in foreign currency is to be repaid in the same currency or in some other acceptable currency.

Thus if the foreign currency becomes stronger than (say) Indian rupees, the Indian borrower has to repay the loan in terms of more rupees than the rupees he obtained by way of loan. The extra rupees he pays is not due to an increase in interest rate but because of unfavorable exchange rate. Conversely he will gain if the rupee is stronger. The fluctuation in the exchange rate causes uncertainty and this uncertainty gives rise to exchange rate risk.

(ii) The following tools are available to cover exchange rate risk:

- (a) Spot contracts.
- (b) Rupee forward contract.
- (c) Rupee roll over contract.
- (d) Cross-currency forward contract.
- (e) Cross currency roll over contract.
- (f) Cross currency options.
- (g) Currency futures.
- (h) Currency and interest rate swaps.
- (i) Home currency Invoicing.

(iii) **Option I (To finance the purchase by availing loan at 18% per annum):**

Cost of machine .		Rs. in lakhs
3,400 lakh yen as Rs. 100 = 340 yen	=	1,000.00
Add: Interest at 4.5% I Quarter	=	45.00
Add: Interest at 4.5% II Quarter	=	<u>47.03</u>
(on Rs. 1045 lakhs)		
Total outflow in rupees	=	<u>1,092.03</u>

Alternatively, interest may also be calculated on compounded basis, i.e.,
Rs. 1,000 x $[1 + 0.045]^2$ = Rs. 1,092.03 lakhs.

Option II (To accept the offer from foreign branch):

Cost of letter of credit		Rs. in lakhs
at 1% on 3,400 lakhs yen as Rs. 100 = 340 yen	=	10.00
Add: Interest I Quarter	=	0.45
Add: Interest II Quarter	=	<u>0.47</u>
	(A) =	<u>10.92</u>

Payment at the end of 180 days: -

Cost	3,400.00 lakhs yen
Interest at 2% p.a. $[3,400 \times 2/100 \times 180/365]$	<u>33.53</u> lakhs yen

3,433.53 lakhs yen :

Conversion at Rs: 100 = 345 yen $[3,433.53/345 \times 100]$ (B) = Rs. 995.23

Total Cost: A + B = 1,006.15 lakhs :

Advice : Option No.. 2. is cheaper. Hence, the offer can be accepted.

Answer 2

- (a) **Cross Currency Roll Over Contracts** : Cross Currency Roll Over contracts are contracts to cover overseas leg of long-term foreign exchange liabilities or assets. The cover is initially obtained for six months and later extended for further period of six months and so on.

Roll over charge or benefit depends on forward premium or discount; which in turn, is a function of interest rate differentials between US dollar and the other currency. There is no risk of currency appreciation or depreciation in the overseas leg.

Roll over for a maturity period exceeding six months is not possible because in the inter- bank market, quotations beyond six months are not available. **(currently there is no such time limit)**

Under the Roll Over Contract the basic rate of exchange is fixed but loss or gain arises at the time of each Roll over depending upon the market conditions.

Answer 3:

Forward as hedge instrument : International transactions both trade and financial give rise to currency exposures. A currency exposure if left unmanaged leaves a corporate open to profits or losses arising on account of fluctuations in currency ratio. One way in which corporate can protect itself from effects of fluctuations in currency rates is through buying or selling in forward markets.

A forward transaction is a transaction requiring delivery at future date of a specified amount of one currency for a specific amount of another currency. The exchange rate is determined at the time of entering into the contract but the payment and delivery takes place on maturity. Corporate use forwards to hedge themselves against fluctuations in currency price that would have a significant impact on their financial position. Banks use forward to offset the forward contracts entered into with non-bank customers.

Answer 4

Debt route for foreign exchange funds : The following are some of the instruments used for borrowing of funds from the international market:

- (i) **Syndicated bank loans** : The borrower should obtain a good credit rating from the rating agencies. Large loans can be obtained in a reasonably short period with few formalities. Duration of the loan is generally 5 to 10 years. Interest rate is based on LIBOR plus spread depending upon the rating. Some covenants are laid down by the lending institutions like-maintenance of key financial ratios.
 - (ii) **Euro bonds** : These are basically debt instruments denominated in a currency issued outside the country of the currency. For example. Yen bond floated in France. Primary attraction of these bonds is the shelter from tax and regulations which provide scope for arbitraging yields. These are usually bearer bonds and can take the form of (i) traditional fixed rate bonds (ii) floating rate notes (FRN's) (iii) Convertible bonds.
 - (iii) **Foreign bonds**: Foreign bonds, are foreign currency bonds and sold at the country of that currency and are subject to the restrictions as placed by that country on the foreigners' funds.
 - (iv) **Euro Commercial Papers** : These are short term money market securities usually issued at a discount, for maturity in less than one year.
 - (v) **External Commercial Borrowings (ECB's)** : These include commercial bank loans, buyer's credit and supplier's credit, securitised instruments such as floating rate notes and fixed rate bonds, credit from official export credit agencies and commercial borrowings from multi-lateral financial institutions like TFCI, ADB etc. External Commercial borrowings have been a popular source of financing for most of capital goods imports. They are gaining importance due to liberalization of restrictions. - ECB's are subject to overall ceilings with sub-ceilings fixed by the government from time to time.
 - (vi) All other loans are approved by the government.
-

Answer 5

Computation of missing entries in the table

(1) 3 months

$$\left(\frac{1.195}{1.115}\right)^{1/4} = \frac{F}{7.05} \quad F = 7.17$$

Alternatiely

$$\frac{1.04875}{1.02875} = \frac{F}{7.05} = 7.19 \text{ (less accurate)}$$

(2) 6 months

Forward discount on franc % per year = - 6.3% or 3.15% for 6 months.

Hence 6 months Forward rate = 0.141844 dollar (Spot rate) (100% - 3.15)
= 0.13737 dollars

Forward francs per dollar = 1/0.13737

Or Forward francs per dollar = 7.28 francs

Dollar interest rate = $12\frac{1}{4}\%$

(annually compounded) .

$$\left(\frac{1+r}{1.1225}\right)^{\frac{1}{2}} = \frac{7.28}{7.05} \quad \frac{1+\frac{r}{2}}{1+\frac{.1225}{2}} = \frac{7.28}{7.05}$$

r = 19.7%

Alternatiely

$$\frac{1+r \times 0.5}{1.06125} = \frac{7.28}{7.05}$$

R = 19.2% (Less accurate)

(3) 1 Year

Franc interest rate = 20%

(annually compounded)

Forward franc per dollar 7.5200

Today's spot rate is 7.05 (given) francs per dollar i.e. 1 Franc = 0.141844 dollar

Forward francs is 7.52 francs per dollar i.e. franc = 0.132978 dollar

Difference 0.008866 dollar

Forward discount on Francs per cent per year = $\frac{0.008866}{0.141844} \times 100$
= -6.25% or - 6.3% (rounded off)

Again, Differential in interest rates = Differential between forward
Between the two countries rate and spot rate

i.e. $\frac{1+\text{Dollar interest rate}}{1+0.20} = \frac{7.05}{7.52}$

Or Dollar interest rate = $1.20 \times 0.9374 - 1$
= $1.125 - 1$

= 0.125 or 12.5%

Answer 6

(a) Firstly, the interest is calculated at 3% p.a. for 6 months. That is:

$$\text{USD } 20,00,000 \times 3/100 \times 6/12 = \text{USD } 30,000$$

From the forward points quoted, it is seen that the second figure is less than the first, this means that the currency is quoted at a discount.

(i) The value of the total commitment in Indian rupees is calculated as below:

Principal Amount of loan	USD 20,00,000
Add: Interest	USD 30,000
Amount due	USD 20,30,000
Forward Rate .	Rs.48.4575
Value of Commitment	Rs.9,83,68,725

(ii) It is seen from the forward rates that the market expectation is that the dollar will depreciate. If the firm's own expectation is that the dollar will depreciate more than what the bank has quoted, it may be worthwhile not to cover forward and keep the exposure open. If the firm has no specific view regarding future dollar price movements, it would be better to cover the exposure. This would freeze the total commitment and insulate the firm from undue market fluctuations. In other words, it will be advisable to cut the losses at this point of time

(b) Spot rate of Re. 1 against yen = 108 lakhs yen/Rs. 30 lakhs = 3.6 yen per rupee

Anticipated decline in Exchange rate = 10%.

Expected spot rate after 3 months

$$= 3.6 \text{ yen} - 10\%$$

$$= 3.6 - 0.36 = 3.24 \text{ yen per rupee}$$

3 months forward rate of Re. 1 = 3.3 yen

	Rs. (in lakhs)
Present cost of 108 lakhs yen	30
Cost after 3 months: 108 lakhs yen/ 3.24 yen	<u>33.33</u>
Expected exchange loss	<u>3.33</u>

If the expected exchange rate risk is hedged by a Forward contract:

Present cost	30
Cost after 3 months if forward contract is taken 108 lakhs yen/ 3.3 yen	<u>32.73</u>
Expected loss	<u>2.73</u>

Suggestion : If the exchange rate risk is not covered with forward contract, the expected exchange loss is Rs. 3.33 lakhs. This could be reduced to Rs. 2.73 lakhs if it is covered with Forward contract. Hence, taking forward contract is suggested.

Answer 7

(i) Under the given circumstances, the USO is expected to quote at a premium in India as the interest rate is higher in India.

(ii) Calculation, of the forward rate:

$$\frac{1+R_h}{1+R_f} = \frac{F_1}{E_0}$$

Where : R_h is home currency interest rate, R_f is foreign currency interest rate, F_1 is end of the period

forward rate, and E_0 is the spot rate.

$$\text{Therefore } \frac{1+(0.08/2)}{1+(0.02/2)} = \frac{F_1}{45.50}$$

$$\frac{1+0.04}{1+0.01} = \frac{F_1}{45.50}$$

$$\text{or } \frac{(1.04)}{1.01} \times 45.50 = F_1$$

$$\text{or } \frac{47.32}{1.01} = F_1$$

$$\text{or } F_1 = 46.85.$$

(iii) Rate of premium:

$$\frac{46.85 - 45.50}{45.50} \times \frac{12}{6} \times 100 = 5.93\%$$

Answer 8

(i) Rate of discount quoted by the bank

$$= \frac{45.2 - 45.6}{45.6} \times 100 \times \frac{365}{60} = -5.34\%$$

ICAI Solution:

$$= \frac{(45.20 - 45.60) \times 365 \times 100}{45.20 \times 60} = 5.38\%$$

Above solution of ICAI is wrong because question is asking discount of dollar not premium on rupees.

(ii) Probable loss of operating profit:

$$(45.20 - 45.50) \times 1,00,000 = \text{Rs. } 30,000$$

Answer 9

Original contract for Swiss Francs 1,00,000 @ 36.25 — amount receivable by the customer. To cancel the purchase contract 1 month before the due date — The contract will be cancelled at 1 month forward sale rate i.e. Swiss Francs 1 = 36.52 payable by the customer.

Hence, Swap profit loss to the customer:

Rs. 36.52 payable by the customer

Rs. 36.25 receivable by the customer

Rs. 0.27 Net payable by the customer i.e. loss

Therefore, total loss to the customer is

Swiss Francs 1,00,000 x Rs. 0.27 = Rs. 27,000

Answer 10

On January 28, 2005 the importer customer requested to remit SGD 25 lakhs.

To consider sell rate for the bank: .

US \$ = Rs. 45.90

Pound 1 = US\$ 1.7850

Pound 1 = SGD3.1575 x !'77

Therefore, SGD 1 = $\frac{\text{Rs. } 45.90 \times 1.7850}{\text{SGD } 3.1575}$

SGD 1 = Rs. 25.9482

Add: Exchange margin (0.125%) Rs. 0.0324

Rs. 25.9806

On February 4, 2005 the rates are

US \$ = Rs. 45.97

Pound 1 = US\$ 1.7775

Pound 1 = SGD3.1380

Therefore SGD 1 = $\frac{\text{Rs.45.97} \times 1.7775}{\text{SGD3.1380}}$

SGD 1 = Rs.26.0394

Add: Exchange margin (0.125%) Rs. 0.0325

Rs. 26.0719

Alternative Solution:

We need to calculate cross ask rates as follows :

$$\frac{\text{Rs.}}{\text{SGD}} = \frac{\text{Rs.}}{\text{USD}} \times \frac{\text{USD}}{\text{GBP}} \times \frac{\text{GBP}}{\text{SGD}}$$

(1) on Jan 28

$$= 45.90 \times 1.7850 \times \frac{1}{3.1575}$$

= 259482

Merchant ask = 25.9402 + .125% = 25.98.

(2) On Feb 4

$$= 45.97 \times 1.7775 \times \frac{1}{3.1380}$$

= 26.0394

Merchant ask = 26.0394 + .125% = 26.07.

Hence, loss to the importer

= SGD 25,00,000 (Rs.26.07 – Rs.25.98)

= Rs.2.25,000.

Answer 11

Exchange Position

Particulars	Purchase Sw. Fcs.	Sale Sw. Fcs.
Opening Balance Overbought	50,000	-
Purchased a Bill on Zurich	80,000	-
Forward Sales – TT	-	60,000
Cancellation of Forward Purchase Contract	-	30,000
TT Sales	-	75,000
Draft on Zurich cancelled	<u>30,000</u>	-
	1,60,000	1,65,000
Closing Balance Oversold	<u>5,000</u>	-
	<u>1,65,000</u>	<u>1,65,000</u>

Cash Position (Nostro A/c)		
	Credit (Deposit)	Debit (withdrawal)
Opening balance credit	1,00,000	-
TT sales	-	75,000
	1,00,000	75,000
Closing balance (credit)	-	25,000
	<u>1,00,000</u>	<u>1,00,000</u>

The Bank has to buy spot TT Sw. Fcs. 5,000 to increase the balance in Nostro account to Sw. Fcs. 30,000. This would bring down the oversold position on Sw. Fcs. As Nil. Since the bank requires an overbought position of Sw. Fcs. 10,000, it has to buy forward Sw. Fcs. 10,000.

Answer 12

The bank (Dealer) covers itself by buying from the market at market selling rte.

Rupee – dollar selling rate	=	Rs.42.85
Dollar – Hong Kong Dollar	=	HK \$ 7.5880
Rupee – Hong Kong cross rate	=	Rs. 42.85/7.5880
	=	Rs.5.6471

Profit / Loss to the Bank

Amount received from customer (1 crore x.5.70)	Rs.5,70,00,000
Amount paid on cover deal (1 crore x 5647)	Rs.5,64,71,000
Profit to Bank	<u>Rs.5,29,000</u>

Alternative solutions.

$$\frac{\text{Rs.}}{\text{HKD}} - \frac{\text{Rs.}}{\text{USD}} \times \frac{\text{USD}}{\text{HKD}}$$

$$\text{We need to calculate rate} = 42.85 \times \frac{1}{7.5880} = 5.6471$$

$$\text{Profit } (5.70 - 5.6471) \times 1,00,000 \\ = \text{Rs. } 5,29,000.$$

Answer 13

Let us assume Canada is the home country hence the quote given in question is a direct quote. With the help of following formula we can calculate Ideal Forward Rate as follows

$$\frac{1 + r^h}{1 + r^f} = \frac{F}{S} \quad \frac{1.0225}{1.0175} = \frac{F}{0.665}$$

Ideal forward rate = F = 0.668. Now the Actual Forward rate is 0.670. Means DM is overvalued in forward hence one can start arbitrage by borrowing Canadian dollar.

Alternatively :

In this case, DM is at a premium against the Can \$.

$$\text{Premium} = [(0.67 - 0.665) / 0.665] \times (12/3) \times 100 = 3.01 \text{ per cent}$$

Interest rate differential 9-7 = 2 per cent.

Since the interest rate differential is smaller than the premium, it will be profitable to place money in Deutschmarks the currency whose 3-months interest is lower.

The following operations are carried out:

- (i) Borrow Can\$ 1000 at 9 per cent for 3- months;
- (ii) Change this sum into DM at the spot rate to obtain DM. = (1000/0.665)= 1503.7
- (iii) Place DM 1503.7 in the money market for 3 months to obtain a sum of DM

Principal:	1503.70
Add: Interest @ 7% for 3 months	<u>26.30</u>
	Total = <u>1530.00</u>

- (iv) Sell DM at 3-months forward to obtain Can\$ (1530x0.67) = 1025.1

- (v) Refund the debt taken in Can\$ with the interest due on it, i.e.,
Can\$.

Principal	1000.00
Add: Interest @9% for 3 months	<u>22.50</u>
	Total = 1022.50

- (vi) Net arbitrage gain = 1025.1 — 1022.5 = **Can\$ 2.6**
-

Answer 14

(1) Receipts using a forward contract = 100,000/0.02127 = Rs.47,01 457

(2) Receipts using currency futures

The number of contracts needed is (1,00,000/0.02118) Rs. 47,20,000 = 10

Initial margin payable is 10x Rs.15,000 = Rs.1,50,000

On September 1 Cash Market Closes at 0.02133

Receipts = US\$1,00,000/0.02133 = 46,88,233

Variation Margin = [(0.02134 – 0.02118) x 10 x 472000]/0.02133

or (0.00016 x 10 x 472000) / .02133 = 755.2/0.02133 +35,406

47,23,639

Less : Interest Cost – 1,50,000 x 0.08 x 3/12 Rs. 3,000

Net Receipts Rs.47,20,639

(3) No hedge

US\$ 1,00,000/0.02133 Rs.46,88,233

The most advantageous option would have been to hedge with futures.

Answer 15

$$\frac{1 + r^h}{1 + r^f} = \frac{F}{S} \quad \frac{1.06}{1.04} = \frac{F}{48.0123}$$

F=48.9356

Actual forward rate is lower than the Ideal forward rate hence one can start arbitrage by borrowing foreign currency i.e.\$.

- 1. Borrow US\$ 83312 for 6 months

Amount to be repaid after 6 months

= US \$ 83312 (1+0.08 x 6/12) = US\$86644.48

- 2. Convert US\$ 83312 into Rupee and get the principal i.e. Rs.40,00,000

Interest on investments for 6 months — Rs.4000000 x 0.06 = Rs.240000

Total amount at the end of 6 months = Rs.(4000000 + 240000/-) Rs.42,40,000

3. Converting the same at the forward rate = Rs.4240000/ Rs.48.8190= US\$ 86851.43
4. Hence the gain is US \$ (86851 .43 — 86644.48) US\$ 206.95 OR Rs.10103 i.e., (\$206.95 x Rs.48.8190)

Answer 16

(i) Net exposure of each foreign currency in Rupees :

	Inflow (Millions)	Outflow (Millions)	Net Inflow (Millions)	Spread	Net expected gain or loss (Millions)
US\$	40	20	20	0.81	16.20
FFr	20	8	12	0.67	8.04
UK	30	20	10	0.41	4.10
Japan Yen	15	25	-10	-0.80	8.00

Answer 17

(a) Forward Contract: £ 300000 x 1.96 = \$588000

(b) Money Market Hedge:

- Borrow \$ 574162.68 @ 5.5% per 180 days
- Convert it into £: \$ 574162.68/2 = £287081.34
- Invest £: 287081.34 x 1.045 = £300000
- Make payment of £300000
- Make repayment of dollar borrowings: \$ 574162.68 x 1.055= \$605742

(c) Option Contract:

Expected Spot rate in 180 days	Exercise Option	Premium	Total Price per unit	Probability	Price x Pr.
1.91	No	0.04	1.95	0.25	0.49
1.95	No	0.04	1.99	0.60	1.19
2.05	Yes	0.04	2.01	0.15	0.30
Average price (dollars per pound)					1.983

£ 300000 x 1.983 = \$594900

(d) No Hedging:

- Average Exchange Rate= 1.91x0.25 + 1.95x0.60 +2.05x0.15 = 1.955
- Payment= 1.955 x £300000 = \$586500

Conclusion: No hedge is the best strategy.

Answer 18

Option 1: Each company invests/finances its own amount

India	500 x (1 + .064x30/360)	- 502.67
U.S.	\$12.5 x (1 + .015x30/360) = \$12.5156	
	\$12.5156 / .0217	+576.76
U.K.	£6 x (1 + .037x30/360) = £6.0185	
	£6.0185 / .0150	+401.23

		Rs.475.33 millions

Option 2: Cash balances are pooled immediately in India

- 500 + (\$12.5/0.0215) + (£ 6/0.0149) = 484.08
- Invest = 484.08 x (1 + 0.062x30/360) Rs.486.58 millions

Conclusion: option 2 is better.

Answer 19

Solution given for this question for ICAI is unnecessarily bulky. A better solution is as follows:

Currency	Forward Rate	3 months Spot Rate	Comment
Yen	2.427	2.459	Forward rate is better than the expected Spot rate hence hedging is preferable.
USD	0.02160	0.02156	Expected spot rate is better than forward rate hence Do not hedge.
Euro	0.0178	0.0179	Forward rate is better than the expected Spot rate hence hedging is preferable.

Answer 20:

$$\begin{aligned} \text{Premium} &= 50000 \times 39 \times 2\% = \text{Rs. } 39000 \\ \text{FV of Premium} &= 39000 \times 10\% \times 9/12 + 39000 \\ &= 2925 + 39000 \\ &= 41925 \end{aligned}$$

$$\begin{aligned} \text{Total Cost of \$ under forward contract} \\ &= 50000 \times 39 + 41925 \\ &= \text{Rs. } 19,91,925 \end{aligned}$$

(i) **If exchange rate on 30th September 2008 is \$ 1 = Rs.42:**

$$\begin{aligned} \text{Gain due to forward contract} &= 42 \times 50000 - 19,21,925 \\ &= \text{Rs. } 1,08,075 \end{aligned}$$

(ii) **If exchange rate is \$1 = Rs.38**

$$\begin{aligned} \text{Loss due to forward contract} &= 38 \times 50000 - 19,91,925 \\ &= 91,925 \end{aligned}$$

Answer 21 (This question is one of its kind. please go through the solution carefully and try to learn the concept.)

Option I (To finance the purchase by availing loan at 18% per annum):

Cost of machine .		Rs. in lakhs
3,400 lakh yen as Rs. 100 = 340 yen	=	1,000.00
Add: Interest at 4.5% I Quarter	=	45.00
Add: Interest at 4.5% II Quarter	=	<u>47.03</u>
(on Rs. 1045 lakhs)		
Total outflow in rupees	=	<u>1,092.03</u>

Alternatively, interest may also be calculated on compounded basis, i.e.,
 $\text{Rs. } 1,000 \times [1.045]^2 = \text{Rs. } 1,092.03 \text{ lakhs.}$

Option II (To accept the offer from foreign branch):

Cost of letter of credit		Rs. in lakhs
at 1% on 3,400 lakhs yen as Rs. 100 = 340 yen	=	10.00
Add: Interest I Quarter	=	0.45

Add: Interest II Quarter = 0.47

(A) = 10.92

Payment at the end of 180 days: -

Cost 3,400.00 lakhs yen

Interest at 2% p.a. $[3,400 \times 2/100 \times 180/365]$ 33.53 lakhs yen

3,433.53 lakhs yen :

Conversion at Rs: 100 = 345 yen $[3,433.53/345 \times 100]$ (B) = Rs. 995.23

Total Cost: A + B = 1,006.15 lakhs :

Advice : Option No.. 2. is cheaper. Hence, the offer can be accepted.

Answer 22

(a) The arbitrageur can proceed as stated below to realize arbitrage gains.

(i) Buy Rs. from USD 10,000,000 At Mumbai $48.3 \times 10,000,000 = \text{Rs.} 483,000,000$

(ii) Convert Rs. to GBP at London $483,000,000 / 77.52 = \text{GBP} = 6,230,650.155$

(iii) Convert GBP to USD at New York $6,230,650.155 \times 1.6231 \text{ USD} = 10,112,968.26$

There is net gain of USD = 10,112,968.26 less 10,000,000 i.e USD = 112,968.26

Answer 23

(a)

Identify: Foreign currency is an asset. Amount \$ 3,50,000.

Create: \$ Liability.

Borrow: In \$. The borrowing rate is 9% per annum or 2.25% per quarter.

Amount to be borrowed: $3,50,000 / 1.0225 = \$ 3,42,298.29$

Convert: Sell \$ and buy £. The relevant rate is the Ask rate, namely, 1.5905 per £, (**Note:** This is an indirect quote). Amount of £s received on conversion is 2,15,214.27 $(3,42,298.29 / 1.5905)$.

Invest: £ 2,15,214.27 will be invested at 5% for 3 months to get £ 2,17,904.45

Settle: The liability of \$3,42,298.29 at interest of 2.25 per cent quarter matures to \$3,50,000 receivable from customer.

Using forward rate, amount receivable is $= 3,50,000 / 1.6140 = \text{£}2,16,852.54$

Amount received through money market hedge = £2,17,904.45

Gain = $2,17,904.45 - 2,16,852.54 = \text{£}1,051.91$

So, money market hedge is beneficial for the exporter

(b) Forward rate is not given in the question hence the only thing lefts Rohit and Bros to cover the risk in the money market. The following steps are required to be taken:

(i) Borrow pound sterling for 3- months. The borrowing has to be such that at the end of three months, the amount becomes £ 500,000. Say, the amount borrowed is £ x. Therefore

$x [1 + 0.05 \times 3/12] = 500000$

or $x = \text{£}493,827$

(ii) Convert the borrowed sum into rupees at the spot rate. This gives: $493,827 \times 56 = \text{Rs.} 27,654,312$

(iii) The sum thus obtained is placed in the money market at 12 per cent to obtain at the end of 3- months:

$S = 27,654,312 \times [1 + 0.12 \times 3/12] = \text{Rs.} 28,483,941$

(iv) The sum of £500,000 received from the client at the end of 3- months is used to refund the loan taken earlier.

From the calculations. It is clear that the money market operation has resulted into a net gain of Rs.483,941 (= 28,483,941 – 500.000 × 56).

Answer 24

(a) (i) According to Purchasing Power Parity forward rate is

$$Spot \left[\frac{1+r^H}{1+r^F} \right] =$$

Spot rate after one year: $43.40 \left[\frac{1.065}{1.03} \right] = 44.8751$

Spot rate after three years: $43.40 \left[\frac{1.065}{1.03} \right]^3 = 47.9762$

(ii) As per interest rate parity

$$\frac{1+r^H}{1+r^F} = \frac{F}{S} \qquad \frac{1+0.075 \times 3/12}{1+0.035 \times 3/12} = \frac{F}{0.7570}$$

F= 0.7645

Answer 25

Spot \$1=Rs.46.00 Firm can today **sell dollars** at this rate
 \$1=Rs.46.25 Firm can today **buy dollars** at this rate

Forward \$1=Rs.47.00 Firm can **sell dollars** at this rate after 2 months
 \$1=Rs.47.50 Firm can **buy dollars** at this rate after 2 months

(i) Rs.25,00,000 / 47 = \$53191.49

(ii) \$2,00,000 x 46.25 = Rs.92,50,000

(iii) **en-cash dollars now:**

encash now \$69000 x 46 = Rs.31,74,000

Invest for two months = 3174000 x (1 + 0.10x2/12) = Rs.32,26,900

en-cash dollars after two months:

\$69000 x 47 = Rs.32,43,000

It is better to en-cash dollars after two months

Answer 26

(a)

- | | |
|---|-----------------|
| 1) The amount of EUR bought by selling USD 10,00,000 * 1.4400 | = EUR 14,40,000 |
| 2) The amount of EUR sold for buying USD 10,00,000 * 1.4450 | = EUR 14,45,000 |
| 3) Net Loss in the Transaction | = EUR 5,000 |

If we want to express this loss in Indian rupees:

To acquire EUR 5,000 from the market @

(a) USD 1 = EUR 1.4400 &

(b) USD1 = INR 31.4500

Cross Currency buying rate of EUR/INR is Rs. 31.4500 / 1.440 i.e. Rs. 21.8403

Loss in the Transaction Rs. 21.8403 * 5000 = Rs. 1,09,201.50

(c)

(i) To BUY 1 Million GBP Spot against CHF

1. First to BUY USD against CHF at the cheaper rate i.e. from Bank A.1 USD = CHF 1.4655
2. Then to BUY GBP against USD at a cheaper rate i.e. from Bank B.1 GBP= USD 1.7650

By applying chain rule Buying rate would be

$$1 \text{ GBP} = 1.7650 * 1.4655 \text{ CHF}$$

$$1 \text{ GBP} = \text{CHF } 2.5866$$

Amount payable CHF 2.5866 Million or CHF 25,86,600

(ii) Calculation of cross currency rate=

$$\frac{\text{CHF}}{\text{GBP}} = \frac{\text{CHF}}{\text{USD}} \times \frac{\text{USD}}{\text{GBP}}$$

$$\text{Spot Bid rate} = 1.4650 \times 1.7645 = 2.5850$$

$$\text{Spot Ask rate} = 1.4655 \times 1.7660 = 2.5881$$

$$3 \text{ months forward Bid rate} = 1.4655 \times 1.7620 = 2.5822$$

$$3 \text{ months forward Ask rate} = 1.4665 \times 1.7640 = 2.5869$$

(Note: 3 months forward rate USD 1 = CHF 1.4655/1.4665 and GBP 1 = USD 1.7620/1.7640)

Implied swap points for 3 months forward rate :

$$\text{Bid} = 2.5822 - 2.5850 = \text{discount } 28 \text{ points}$$

$$\text{Ask} = 2.5869 - 2.5881 = \text{discount } 12 \text{ points}$$

$$\text{Implied swap points} = 28/12$$

Answer 27

Money Market Hedge:

$$1) \text{ Borrow: } \$342298.29 \text{ (} \$35,0000/1.0225)$$

$$2) \text{ Convert into pounds : } \$342298.29 / 1.5905 = \text{£ } 215214$$

$$3) \text{ Invest Pounds} = \text{£ } 215214 \times 1.0125 = \text{£ } 217904$$

$$4) \text{ Repay dollar borrowings: } \$342298.29 \times 1.0225 = \$350000$$

$$\text{Forward Cover: } \$3,50,000/ 1.6140 = \text{£ } 216853$$

Conclusion: Money market hedge is better than forward cover.

Answer 28

$$(i) \text{ Forward Cover: } \$364897 / 1.5455 = \text{£ } 236103$$

(ii) Money Market Hedge:

$$1) \text{ Borrow £ } 228512.19 \text{ @7\% p.a.}$$

$$2) \text{ Convert into dollars: } 228512.19 \times 1.5617 = \$356867.48$$

$$3) \text{ Invest in USA @4.5\%: } \$356867.48 \times 1.0225 = \$364897$$

$$4) \text{ Pay import bill out of the above proceeds.}$$

$$5) \text{ Repay pound borrowings: } \text{£}228512.19 \times 1.035 = \text{£}236510$$

(iii) Currency Option:

Working Note: Calculation of no. of lots

$$\$364897 / 1.7 = \text{£}215233$$

$$\text{£}215233/ \text{lot of } \text{£}12500 = 17.21 \text{ (approx. 17 lots)}$$

Step 1: Put Option premium in terms of pounds

$$\text{£}12500 \times 17 \text{ lots} \times \$0.96 = \$20400$$

$$\$20400 / 1.5617 = \text{£}13063$$

Step 2: Pounds payable on exercise of Put options

£12500 x 17 = **£212500**

Step 3: Forward contract for remaining amount of dollars

Forward contract amount = total dollars required – dollars available under option contract

= \$364897 - (£212500 x 1.7)

= \$364897 - \$361250

= \$3647

\$3647 / 1.5455 = **£2360**

Step 4: Total pounds required under currency options

= 13063 + 212500 + 2360 = £227923

Conclusion: Currency option is the best tool available for hedging.

Answer 29

One Year Forward Rate

$$\frac{1 + i_H}{1 + i_F} = \frac{\text{Forward Rate}}{\text{Spot Rate}} \frac{1.08}{1.04} = \frac{F}{46} \quad F = 47.77$$

Four Years Forward Rate

$$\frac{(1 + i_H)^4}{(1 + i_F)^4} = \frac{\text{ForwardRate} (1.08)^4}{\text{SpotRate} (1.04)^4} = \frac{F}{46} \quad F = 53.50$$

Answer 30

- 1) Originally bank entered into a forward sale contract at \$1= ` 42.32 due on 30th October, 2010.
- 2) Now on the due date bank will make spot purchase to cancel the above contract. Spot purchase can be made at the merchant bid rate (Interbank bid minus margin). As per FEDAI rules bank need not to load margin for this type of contract but language of the question suggests importer is ready to pay margin. Therefore cancellation rate will be 41.5000 – 0.075% = 41.47.
- 3) Cancellation charges may be calculated as follows:

Forward Sale by bank = +42.32

Spot Purchase by bank = -41.47

Net = +0.85

X \$20,000

Net Receivable = ` 17000

- 4) For extension bank will enter into 3 months forward sale contract at merchant ask rate as follows:

Spot Interbank ask rate = ` 41.5200

Add: Premium@0.93% = ` 00.3861

Forward Interbank ask = ` 41.9061

Add: Selling margin@0.20% = ` 00.0838

Forward Merchant ask = ` 41.99

- 5) Conclusion: Bank will recover ` 17,000 from the importer and will book a fresh forward sale contract for him at ` 41.99.
-

Answer 31

Let us assume that Canadian dollar is the home currency and DM is the foreign currency.

Formula for interest rate parity is as under:

$$\frac{1 + r^{CD}}{1 + r^{DM}} = \frac{\text{Forward Rate}}{\text{Spot Rate}} \frac{1 + 0.10 \times 3 / 12}{1 + 0.08 \times 3 / 12} = \frac{F}{0.666} \quad F = 0.669$$

Ideally the forward rate should be DM1 = CD 0.669. Actual forward rate is 0.671. It means foreign currency is currently overvalued and one can start arbitrage by borrowing home currency.

Steps for arbitrage:

- 1) Borrow Canadian Dollar 1000 @10% p.a.
- 2) Convert into Dm = 1000/0.666 = 1501.50
- 3) Invest @8% DM 1501.50 x 1.02 = DM1531.53
- 4) Reconvert into CD = 1531.53 x 0.671 = 1027.65 CD
- 5) Repay dollar borrowings = 1000 x 1.025 = 1025 CD
- 6) Net profit = 1027.65 - 1025 = 2.65 Canadian Dollar.

Answer 32

$$\text{Cross currency rate} = \frac{INR}{SGD} = \frac{INR}{USD} \times \frac{USD}{GBP} \times \frac{GBP}{SGD}$$

$$\text{Interbank Ask rate On 28th January} = 45.90 \times 1.7850 \times \frac{1}{3.1575} = 25.9482$$

$$\text{Merchant ask rate} = 25.9482 + 0.125\% = 25.9807$$

$$\text{Interbank Ask rate On 4th February} = 45.97 \times 1.7775 \times \frac{1}{3.1380} = 26.0394$$

$$\text{Merchant ask rate} = 26.0394 + 0.125\% = 26.0720$$

$$\text{Impact of strike on importer} = (25.9482 - 26.0394) \times S\$ 25,00,000 = \text{Rs. } 2,28,000 \text{ Loss}$$

Answer 33

Assuming that 6 month forward premium is considered as discount, because generally premium is mentioned in ascending order and discount is mentioned in descending order.

(i) Receipt under three proposals

$$(a) \text{ Invoicing in Pound sterling: } \text{€ } 40,00,000 / 1.1770 = \text{£ } 33,98,471$$

$$(b) \text{ Use of Forward Contract: } \text{€ } 40,00,000 / (1.1770 - 0.0055) = \text{£ } 34,14,426$$

(c) Use of future Contract:

$$(i) \text{ Calculation of no. of lots: } \text{€ } 40,00,000 / 1.1760 = \text{£ } 34,01,360 \\ \text{£ } 34,01,360 / 62500 = 54 \text{ contracts approx.}$$

$$(ii) \text{ Euro amount hedged by future contract} = 54 \times \text{£ } 62500 = \text{£ } 33,75,000$$

$$(iii) \text{ Profit on futures} = \text{Sell future } (1.1785) - \text{Buy future } (1.1760) = \text{€ } 0.0025 \\ \text{€ } 0.0025 \times 33,75,000 = \text{€ } 8,438$$

$$(iv) \text{ Sell of euro in cash market after six months} = \text{€ } 40,08,438 / 1.1785 = \text{€ } 34,01,305.$$

Decision: Option (b) is the best. Means company should enter into a forward contract.

Answer 34

(i) If importer **pays now**, he will have to buy US\$ in Spot Market by availing overdraft facility. Accordingly, the outflow under this option will be

Amount required to purchase \$130000[\$130000X`48.36]	6286800
Add: Overdraft Interest for 3 months @15% p.a.	235755
	6522555

(ii) If importer **makes payment after 3 months** then, he will have to pay interest for 3 months @ 5% p.a. for 3 month along with the sum of import bill. Accordingly, he will have to buy \$ in forward market. The outflow under this option will be as follows:

	\$
Amount of Bill	130000
Add: Interest for 3 months @5% p.a.	1625
	131625

Amount to be paid in Indian Rupee after 3 month under the forward purchase contract `6427249
(US\$ 131625 X ` 48.83)

Since outflow of cash is least in (ii) option, it should be opted for.

Answer 35

(A) Cover payables in forward market

Export proceeds \$450,000 x 48.5	= Rs.2,18,25,000
Add: Interest on export proceeds @12% p.a. for 1 month 2,18,25,000 x 1%	= Rs.2,18,250
Less: Payment of import bill \$ 7,00,000 x 49.15	= <u>Rs.3,44,05,000</u>
Net Payment	Rs.1,23,61,750

(B) Lag receivables by one month

Net Payment for Import (\$7,00,000 - \$4,50,000) x 49.15	= Rs.1,22,87,500
Add: Loss on Cancellation of forward contract (48.5 sale – 49 purchase) x \$ 4,50,000	=Rs.2,25,000
Add: Interest on cancellation charges Rs2,25,000 x 3%	<u>=Rs. 6,750</u>
	Rs. 1,25,19,250

Conclusion: second option is better, i.e., company should lag receivables by one month.

Answer 36

(a) Netting means the settlement of obligations between two parties that processes the combined value of transactions. It is designed to lower the number of transactions required. For example, if Indian Importer owed US Exporter \$100,000, and US Exporter owed Indian Importer `12,50,000. In this case either both the parties can make payment separately to each other or they can make settlement of net amount.

But in this case there is a problem that one party owes in dollars and other owes in rupees. Therefore we have to bring both either in dollars or in rupees. Suppose we decided to convert `12,50,000 in dollars and current exchange rate is \$1 = Rs. 51.00/52.00. Now there is another problem if we take the bid rate, i.e., 51 then the entire advantage of bid-ask spread will go to Indian importer and if we take the ask rate, i.e., 52 then the entire advantage of bid-ask spread will go to US Exporter. If the two transactions are settled separately then neither importer nor exporter will get this advantage and it will go to the bank/forex dealer. But in this case there is not bank/forex dealer hence it is appropriate to give one half advantage to each party. Hence we can use a mid rate, i.e., 51.5.

Now Indian importer has to pay	\$1,00,000
Indian importer has to receive	`12,50,000/51.5 <u>\$24272</u>
Net payment by Indian importer	\$75,728

So the two main advantages of netting are:

- 1) Reduction in money transfer cost.
- 2) Advantage of bid ask spread in case of forex transactions.

(b)

In Latin NOSTRO account means “Our Account with you”. For example if State Bank of India opens a dollar account with the New York bank then it is called Nostro account.

VOSTRO means “Your account with us”. For example rupee account of Sri Lanka bank with State Bank of India.

LORO means “Their account with them”. If Bank of Rajasthan wants to transfer dollar to the nostro account of SBI maintained with the New York Bank, they will call this account LORO account.

How to prepare Nostro Account?

There are two parts of Nostro account: 1) Exchange position 2) Fund/ Cash Position.

a) Exchange position

It is also called Currency position. The aggregate relationship between the amount of a currency bought and the amount of the same currency sold is known as ‘position’ in the currency. It can be as under:

Overbought position: If amount of foreign currency bought by a bank is more than the amount sold, the bank is said to have ‘overbought’ or ‘long’ or ‘plus’ position.

Oversold position: If amount of foreign currency sold by a bank is more than the amount bought, the bank is said to have ‘oversold’ or ‘short’ or ‘minus’ position.

Square position: If amount of foreign currency bought by a bank equals the amount sold, the bank is said to have ‘square’ position. Similarly, if there is small difference in a currency bought and sold the bank is said to have ‘Near Square position’.

b) Cash position

It is also called Fund position. Banks maintain accounts with counter – party banks always in foreign currency. Banks, depending on items requirement, have many such accounts in different currencies. It is not uncommon that the bank may have more than one account even in one currency. Balances available in the accounts reflect cash position.

Solution 37

(i) Rate of interest in home country is more than rate of interest in foreign country therefore foreign currency (Dollar) is expected to be at premium.

(ii) Expected 6 months forward rate:

$$\frac{1 + r^H}{1 + r^F} = \frac{F}{S}$$

Here r^H = rate of interest in home country
 r^F = rate of interest in foreign country
 F = Forward rate of exchange
 S = Spot rate of exchange

$$\frac{1.05}{1.02} = \frac{F}{55.50}$$

$$F = 57.13$$

(iii) Forward Premium = $\frac{F-S}{S} \times 100 \times \frac{12}{n} = \frac{(57.13-55.50)}{55.50} \times 100 \times \frac{12}{6}$
 = 5.87% p.a.

Alternative Solution:

$$\text{Forward Premium} = \frac{r^H - r^F}{1 + r^F} \times 100 \times \frac{12}{n} = \frac{0.05 - 0.02}{1.02} \times 100 \times \frac{12}{6} = 5.88\%$$

Solution 38

(i) Pay in 60days: \$2 million x 57.10 = Rs.114.20 million
 Future value at the end of 90 days = 114.20 + 114.20 x 10% x 1/12 = 114.20 + 0.95 = 115.15

(ii) Pay in 90 days: \$2 million x (1 + 0.08/12) x 57.50 = 115.76 million

Decision: better to pay in 60 days.

Solution 39

Ask Rate because sale to customer so, buy to market

$$\frac{\text{INR}}{\text{HK\$}} = \frac{\text{INR}}{\text{\$}} \times \frac{\text{\$}}{\text{HK\$}}$$

$$\frac{\text{INR}}{\text{HK\$}} = \frac{55.20}{1} \times \frac{1}{7.9250} = 6.9653$$

Buying rate HK\$1 = ` 6.9653

Exchange Profit (7.15 - 6.9653) 40,00,000 = ` 7,38,800/-

Solution 40

Sale to a customer is done at Merchant Ask rate and the same may be covered in the market at Interbank Ask rate. Cross currency interbank ask rate may be calculated as follows:

London Market:

$$\frac{\text{INR}}{\text{DKK}} = \frac{\text{INR}}{\text{GBP}} \times \frac{\text{GBP}}{\text{DKK}} = 74.3200 \times \frac{1}{11.4200} = 6.5079$$

New York Market:

$$\frac{\text{INR}}{\text{DKK}} = \frac{\text{INR}}{\text{USD}} \times \frac{\text{USD}}{\text{DKK}} = 49.2625 \times \frac{1}{7.5670} = 6.5102$$

So it is cheaper to buy Danish Kroner through London Market. Profit in this case will be (sale rate - buy rate) x Quantity = (6.5150 - 6.5079) x 10,00,000 = Rs. 7100

Solution 41

Option 1: To invest in London

- 1) Convert \$5,00,000 into pounds at the buying rate of pounds: \$5,00,000/1.5390 = £3,24,886
- 2) Invest it @5% p.a. for three months= £3,24,886 x 1.0125 = £3,28,947
- 3) Convert this again into US dollars at the 3 months forward selling rate of pound = £3,28,947 x 1.5430 = \$5,07,565.

Option 2: To invest in New York

- 1) Invest \$5,00,000 @8% p.a. = \$5,00,000 x 1.02 = \$5,10,000

Option 3: To invest in Frankfurt

- 1) Convert \$5,00,000 into pounds at the buying rate of pounds: \$5,00,000/1.5390 = £3,24,886
- 2) Convert it into Euros at the selling rate of pounds = £3,24,886 x 1.8260 = € 5,93,242
- 3) Invest it @3% p.a. for three months= € 5,93,242 x 1.0075 = € 5,97,691
- 4) Convert it into pounds at the 3 months forward buying rate of pounds = € 5,97,691/1.8150 = £ 3,29,306
- 5) Convert this again into US dollars at the 3 months forward selling rate of pound = £ 3,29,306 x 1.5430 = \$5,08,120.

London branch will be getting highest amount in option 2. Therefore it should invest the surplus in New York.

Solution given by ICAI

If Investment made at London

Convert US\$ 5,00,000 at Spot rate (5,00,000/1.5390) = £ 3,24,886
 Add: £Interest for 3 months on £ 3,24,886@ 5% X 3/12 = £ 4,061
 = £ 3,28,947

Less: Amount Invested \$ 5,00,000
 Interest accrued thereon \$ 5,000
 = \$ 5,05,000

Equivalent amount of £ required to pay the above sum
 (\$ 5,05,000/1.5430) = £3,27,285

Arbitrage Profit = £ 1,662

If Investment made at New York

Gain \$ 5,00,000 (8% - 4%) X 3/12 = \$ 5,000
 Equivalent amount in £ 2 months (\$ 5,000/ 1.5475) = £ 3,231

If Investment made at Frankfurt

Cross Rate(Spot) Bid Rate

$$\frac{\text{€}}{\text{£}} = \frac{\text{€}}{\text{£}} \times \frac{\text{£}}{\text{£}}, \quad = \frac{\text{€}}{\text{£}} = \frac{1.8260}{1} \times \frac{1}{1.5390} = 1.1865$$

Convert US\$ 5,00,000 at Spot rate Cross Rate (5,00,000 X 1.51865) = € 5,93,250
 Add: £Interest for 3 months on € 5,93,250 @ 3% X 3/12 = € 4,449
 = € 5,97,699
 3 month Forward Rate of selling € 5,97,699/ 1.8150 = £ 3,29,332
 Less: Amounted invested and interest thereon = £ 3,27,285

Arbitrage Profit = £ 2,047

Since out of three option the maximum profit is in case investment is made in New York. Hence it should be opted.

Solution 42

Cross Rate: (Bid Rate)

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

$$= \frac{61.3625}{1} \times \frac{1.5260}{1} = 93.6392$$

Total £ Required:

$$\frac{25,000,000}{93.6392} = \text{£}2,66,980$$

Answer 43

The bank covers itself by buying from the market at ask rate.

$$\frac{\text{INR}}{\text{HKD}} = \frac{\text{INR}}{\text{\$}} \times \frac{\text{\$}}{\text{HKD}}$$

$$\frac{\text{INR}}{\text{HKD}} = 62.9624 \times \frac{1}{8.4409}$$

Cover Rate = Rs. 7.4592

Profit / Loss to the bank :

Amount received from customer (1 lakh*7.5681)	Rs. 7,56,810
Amount paid on cover deal (1 lakh*7.4592)	Rs. 7,45,920
Profit to Bank	Rs. 10,890

Answer 44

Since the direct quote for Yen and Rs. is not available it will be calculated by cross exchange rate as follows :

$$\frac{\text{Rs.}}{\text{Yen}} = \frac{\text{Rs.}}{\text{\$}} \times \frac{\text{\$}}{\text{Yen}}$$

$$\frac{\text{Rs.}}{\text{Yen}} = 62.22 \times \frac{1}{102.34}$$

Spot Rate on date of export = 1 Yen = Rs. 0.6080

Expected Rate :

$$\frac{\text{Rs.}}{\text{Yen}} = 65 \times \frac{1}{124} = \text{Rs. } 0.5242$$

Forward Rate :

$$\frac{\text{Rs.}}{\text{Yen}} = 66.50 \times \frac{1}{110.35} = \text{Rs. } 0.6026$$

Loss without forward contract (0.6080-0.5242)10,000,000 Yen	Rs. 838000
Loss with forward contract (0.6080-0.6026)10,000,000 Yen	Rs. 54000
Gain due to forward contract	Rs. 784000

ActualRate

=

$$\frac{\text{Rs.}}{\text{Yen}} = 66.25 \times \frac{1}{110.85} = \text{Rs. } 0.5977$$

$$\text{Loss} = (0.6080 - 0.5977) \times 10,000,000 \text{ Yen} = \text{Rs. } 1,03,000$$

The decision to take forward cover is still justified.

Answer 45

On January 28, the importer requested to remit SGD 25 lakhs.
Therefore, ask rate for bank :

$$\frac{\text{Rs.}}{\text{SGD}} = \frac{\text{Rs.}}{\$} \times \frac{\$}{\text{Pounds}} \times \frac{\text{Pounds}}{\text{SGD}}$$

$$\frac{\text{Rs.}}{\text{SGD}} = 45.90 \times 1.7850 \times \frac{1}{3.1575} = \text{Rs. } 25.9482$$

$$\text{Merchant Rate} = 25.9482 + \text{Exchange Margin @ } 0.125\% (0.0324) = \text{Rs. } 25.9806$$

On February 4, 2013 the rates are :

$$\frac{\text{Rs.}}{\text{SGD}} = \frac{\text{Rs.}}{\$} \times \frac{\$}{\text{Pounds}} \times \frac{\text{Pounds}}{\text{SGD}}$$

$$\frac{\text{Rs.}}{\text{SGD}} = 45.97 \times 1.7775 \times \frac{1}{3.1380} = \text{Rs. } 26.0394$$

$$\text{Merchant Rate} = 26.0394 + \text{Exchange Margin @ } 0.125\% (0.0325) = \text{Rs. } 26.0719$$

$$\text{Loss to the importer} = (26.0719 - 25.9806) \times \text{SGD } 25,00,000 = \text{Rs. } 2,28,250$$

Answer 46

$$\frac{\text{INR}}{\text{HKD}} = \frac{\text{INR}}{\text{USD}} \times \frac{\text{USD}}{\text{HKD}}$$

$$\text{Interbank Ask Rate} = 61 \times \frac{1}{7.5880} = 8.0390$$

Profit on Transaction:

Purchase of HKD from market	8.0390
Sale of HKD to customer	<u>8.0250</u>
Profit per HKD	0.0140
No. of HKD	<u>x 2,00,00,000</u>
Total Profit	` 2,80,000

Answer 47

(a) Option – I (Lagging)

$$\text{Dollar payment} = \$ 1,00,000 \times (1 + 0.10/4) = \$ 1,02,500$$

$$\text{3-months outright forward rate} = ` 59.90 / ` 60.30$$

$$\text{Rupee payment} = \$1,02,500 \times ` 60.30 = ` 61,80,750$$

Option -II (Leading)

Overdraft ($\$1,00,000 \times 60.55$) ` 60,55,000

Interest on Overdraft ($60,55,000 \times 0.14/4$) ` 2,11,925

` 62,66,925

Option I should be preferred as it has lower outflow.

Answer 48

(d) A firm dealing with foreign exchange may be exposed to the following types of risks:

(i) **Transaction Exposure:** A firm may have some contractually fixed payments and receipts in foreign currency, such as, import payables, export receivables, interest payable on foreign currency loans etc. All such items are to be settled in a foreign currency. Unexpected fluctuation in exchange rate will have favourable or adverse impact on its cash flows. Such exposures are termed as transactions exposures.

(ii) **Translation Exposure:** The translation exposure is also called accounting exposure or balance sheet exposure. It is basically the exposure on the assets and liabilities shown in the balance sheet and which are not going to be liquidated in the near future. It refers to the probability of loss that the firm may have to face because of decrease in value of assets due to devaluation of a foreign currency despite the fact that there was no foreign exchange transaction during the year.

(iii) **Economic Exposure:** Economic exposure measures the probability that fluctuations in foreign exchange rate will affect the value of the firm. The intrinsic value of a firm is calculated by discounting the expected future cash flows with appropriate discounting rate. The risk involved in economic exposure requires measurement of the effect of fluctuations in exchange rate on different future cash flows.

Answer 49

- Using Forward Contract

$\$ 10,000,000 / 0.016129 = \text{Rs. } 620,001,240$

- Using Currency Futures

Number of contracts needed = $\frac{(\$10,000,000)}{24,816,975 \times 0.016118} = 25$

Initial Margin payable on 25 contracts @ Rs. 22,500 = Rs. 5,62,500

Receipts = $\$10,000,000 / 0.016136 = \text{Rs. } 619,732,276$

Variation Margin = $\frac{(0.016134 - 0.016118) \times 25 \times 24,816,975}{0.016136} = \text{Rs. } 615,195$

Interest Cost = $5,62,500 \times 0.07 \times \frac{3}{12} = \text{Rs. } 9,844$

Net Receipts = $620,337,627$

- No Hedge

$\$10,000,000 / 0.016136 = \text{Rs. } 619,732,276$

The most advantageous option would have been to hedge with futures.

Answer 50

- The forward sale contract shall be cancelled at Spot TT Purchase for \$ prevailing on the date of cancellation as follows :

Bid Rate = Rs. 63.6800

Less : Exchange Margin @ 0.10% = 0.0636

= $63.6800 - 0.0636 = \text{Rs. } 63.6163$

Rounded off to Rs. 63.6175.

- Amount payable on \$ 2,00,000

Bank sells \$ 200000 @ Rs. 64.4000	Rs. 128,80,000
Bank buys \$ 200000 @ Rs. 63.6163	Rs. 127,23,260

Amount payable by customer	Rs. 1,56,740
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3. Swap Loss

On 10th June the bank does a swap sale at 63.8000 and forward purchase for June at market selling rate of 63.9500,

Amount payable by customer = (63.9500 – 63.8000)*2,00,000 \$ = Rs. 30,000

4. Interest on Outlay of Funds

Bank buys at	64.2800
Bank sells at	63.8000
Amount payable by customer	0.4800

Outlay = 0.2800*200000\$ = Rs. 96,000

Interest @ 12% for 10 days = Rs. 320

5. New Contract Rate

64.2500+0.10% = Rs. 64.3143

6. Total Cost

Cancellation Charges	156740
Swap Loss	30000
Interest	320
Total	187060

Answer 51

1. Pay the supplier in 60 days

If the payment is made to supplier in 60 days the applicable forward rate for USD 1	Rs. 63.15
Payment due	USD 1 crore
Outflow in Rs.	Rs. 63.15 crores
Add : Interest on loan for 30 days @ 9.5% p.a.	0.50 crores
Total outflow in Rs.	Rs. 63.65 crores

2. Availing supplier's offer of 90 days credit :

Amount payable	USD 1 crores
Add : Interest on credit period of 30 days @ 7.75% p.a.	USD 0.00646 crores
Total Outflow in USD	USD 1.00646 crores
Applicable forward rate for USD 1	Rs. 63.45
Total outflow in Rs.	Rs. 63.86 crores

Alternative 1 is better as it has lower cash outflow.

Answer 52

Date	Particulars	Amount
	Forward Premium (Purchase Contract)	32.40
25 th March	1 month Forward Sale	32.947
	Net	0.547
	Quantity	SF 1,00,000
	Receive from customer	Rs. 54,700

Bank can also recover Rs. 500 as flat charges.

Working Notes :

1. Calculation of Forward Sale Rate

$$\frac{Rs.}{SF} = \frac{Rs.}{\$} \times \frac{\$}{SF}$$

$$[(49.4455 + 0.4200) + 0.10\%] \times \frac{1}{1.5150}$$

Rs. 32.947

Answer 53

XYZ, an Indian firm has to buy 5,00,000 JY on 30th June. Since, quote is JY/Rs., relevant rate is bid rate. Company has 2 options :

1. Hedge through currency options

Call option gives right to buy Rs. And Put option gives right to sell Rs., since company has to buy JY (sell Rs.), so company will buy put option.

JY to be bought = 5,00,000

Re. to be sold = $\frac{5,00,000}{2.125} = 2,35,294.12$ Rs.

Premium = 0.098/ Rs. Sold

Statement of Payment :

Premium payable in JY $2,35,294.12 * 0.098 = 23,059$ JY

Premium Payable in Rs. $(23,059/1.9516) = 11,815$

Rs. Paid for purchase of 5,00,000 JY = 2,35,294.12

Total Payment (Rs.) = 2,47,109.12

Note : Since lot size is not given so there is no unhedged JY.

2. Hedge through forward market

Company will book a forward contract today to buy 5,00,000 JY on 30th June @ JY 1.9726/ Rs.

Company will pay $5,00,000/1.9726 =$ Rs. 2,53,472.57

Answer 54

1. Forward Contract

Company will book a forward contract today to buy 5,00,000 Pounds after 180 days @ 1.96/Pound.

\$ Payable = $5,00,000 * 1.96 =$ \$ 9,80,000

2. Money Market Hedge

Invest Pounds = $\frac{5,00,000}{1.0225} = 4,88,998$ Pounds

To deposit Pounds, company will borrow \$,

$4,88,998 * 2 =$ \$ 9,77,996

\$ payable after 180 days @ 5.57%

$9,77,996 * 1.0275 =$ \$ 10,04,891

3. Call options Contract

Premium paid = $5,00,000 * 0.04 = 20,000$ \$

Due date :

Exercise price = \$ 1.97/ Pound

Market Price = $1.91 * 0.30 + 1.95 * 0.5 + 2.05 * 0.20 =$ \$ 1.958

Since $MP < EP$, call option will not be exercised.

Therefore Pounds will be purchased from market,

$5,00,000 * 1.958 = 9,79,000$ \$

Total amount paid = \$ 9,99,000

4. No Hedging = $5,00,000 * 1.958 =$ \$ 9,79,000

Since amount payable is least if no hedging is done, therefore no hedging is better.

Answer 55

Lets assume that Canadian dollar is home currency

$$\frac{1 + r^h}{1 + r^f} = \frac{F}{S} \gg \frac{1 + \frac{r^h}{4}}{1 + \frac{.075}{4}} = \frac{0.671}{0.666} \gg r^h = 10.56\%$$

Ideal interest rate for Canada is 10.56% while actual is only 9.5%. Therefore one should borrow money in Canada and invest it in Germany. (Note: there are many other ways to check direction of arbitrage.)

Steps for arbitrage:

- 1) Borrow say 1,00,000 Canadian dollars @ 9.5%
- 2) Convert into DM: CAD 1,00,000 / 0.666 = DM 1,50,150
- 3) Invest @ 7.5% p.a. for three months: 1,50,150 x (1 + .075/4) = DM 1,52,965
- 4) Convert into CAD: DM 1,52,965 x 0.671 = CAD 1,02,640
- 5) Repay borrowings: CAD 1,00,000 x (1 + .095/4) = CAD 1,02,375
- 6) Profit = 102640 – 102375 = CAD 265



- One of the currency is “Deutsche Mark”, while it has been replace by EURO, 17 years back.

Answer 56

Step 1: Calculation of forward rate: For the sake of ease of calculation let’s assume UK as foreign country in interest rate parity formula -

$$\frac{1 + r^h}{1 + r^f} = \frac{F}{S} \gg \frac{1 + \frac{0.15}{2}}{1 + \frac{0.12}{2}} = \frac{F}{2.5} \gg F = 2.535$$

Export proceeds with forward contract = Can \$ 5,00,000 / 2.535 = £ 1,97,239

- 1) If Can \$ declines by 2% :
 £ 0.98 = CAD2.5 => £ 1 = CAD2.5510
 Realization = Can \$ 5,00,000 / 2.5510 = £ 1,96,002
Gain due to Forward Contract = 197239 – 196002 = £ 1237
- 2) If Can \$ gains by 4% :
 £ 1.04 = CAD 2.5 => £ 1.04 = CAD 2.4038
 Realization = Can \$ 5,00,000 / 2.4038 = £ 2,08,004
Loss due to Forward Contract = 197239 – 208004 = £ 10765
- 3) If pound remains unchanged :
 £ 1 = CAD 2.5
 Realization = Can \$ 5,00,000 / 2.5 = £ 2,00,000
Loss due to Forward Contract = 197239 – 200000 = £ 2761