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**SUGGESTED SOLUTION**

**CA FINAL EXAM**

**S F M**

**Test Code –FNJ 2001**

**BRANCH - (MUMBAI) Dt. 21.05.2017**

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**Answer-1 (a) :**

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

**XYZ Ltd.**

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

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

$$r = 5.04\%$$

Bank will quote 5.04% for a 2V3 FRA.

**ABC Ltd.**

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

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

$$r = 6.38\%$$

Bank will quote 6.38% for a 2V3 FRA.

**(3 Marks)**

- (ii)

		4.50% – Allow to Lapse	5.50% – Exercise
Interest	Rs.100 crores x 4.50%	Rs.4.50 crores	–
	Rs.100 crores x 5.04%	–	Rs.5.04 crores
Premium (Cost of Option)	Rs.100 crores x 0.1%	Rs.0.10 crores	Rs.0.10 crores
		4.60 crores	5.14 crores

**(3 Marks)****Answer-1 (b) :****Workings :****Option I (To finance the purchases by availing loan at 18% per annum) :****Cost of Equipment****Rs.in Lakhs**

3400 lakh yen at Rs.100 = 340 yen

1,000.00

Add : Interest at 18% (on Rs.1000 lakhs) for 6 months

90.00

Total outflow in Rupees

1,090.00**(2 Marks)****Option II (To accept the offer from foreign branch) :****Cost of letter of Credit****Rs. in lakhs**

At 1% on 3400 lakhs yen at Rs.100 = 340 yen

10.00

Add : Interest

0.90

(A)

10.90

Payment at the end of 180 days :

Cost

3400.00 lakhs yen

Interest at 2% p.a. [400 x 2/100 x 180/365]

33.53 lakhs yen3433.53 lakhs yen

Conversion at RS.100 = 345 yen [3433.53 / 345 x 100] (B)

= Rs.995.23 lakhs

Total Cost : (A) + (B)

= 1006.13 lakhs

**(4 Marks)**

**Advise :** Option 2 is cheaper by (1090.00 – 1006.13) lakh or 83.87 lakh. Hence, the offer may be accepted.

**Answer-2 (a) :**

- (i) The contract is to be cancelled on 31.10.2014 at the spot selling rate of US\$ 1

Rs.61.5200

Add : Margin Money 0.20%

Rs. 0.1230Rs.61.6430 or Rs.61.64

US\$ 20,000 @ Rs.61.64

= Rs.12,32,800

US\$ 20,000 @ Rs.62.32	<u>Rs.12,46,400</u>
The difference in favour of the Customer	<u>= Rs.13,600</u>
	<b>(2 Marks)</b>

(ii) The Rate of New Forward Contract	
Spot Selling Rate US\$ 1	= Rs.61.5000
Less : Discount @ 0.93%	<u>Rs.0.5720</u>
	Rs.60.9280
Less ; Margin Money 0.45%	<u>Rs.0.2742</u>
	<u>Rs.60.6538 or Rs.60.65</u>
	<b>(2 Marks)</b>

**Answer-2 (b) :**

	Amount in Rs.lakhs	Amount in Rs.lakhs	Amount in Rs.lakhs
Opening Bank (200 – 185 – 12)	3.00		
Add : Proceeds from sale of securities	63.00		
Add : Dividend received	<u>2.00</u>	68.00	
Deduct :			
Cost of securities purchased	56.00		
Fund management expenses paid (90% of 8)	7.20		
Capital gains distributed = 80% of (63-60)	2.40		
			<b>(3 Marks)</b>
Dividend distributed = 80% of 2.00	<u>1.60</u>	<u>67.20</u>	
Closing Bank			0.80
Closing market value of portfolio			<u>198.00</u>
			198.80
Less : Arrears of expenses			<u>0.80</u>
Closing Net Assets			<u>198.00</u>
Number of units (Lakhs)			20
Closing NAV per unit (198.00/20)			9.90
			<b>(3 Marks)</b>

<b>Rate of Earning (Per Unit)</b>	<b><u>Amount</u></b>
Income received (Rs.2.40 lakhs + Rs.1.60 lakhs) / 20 lakhs	Rs.0.20
Loss : Loss on disposal (Rs.10 – Rs.9.90)	<u>Rs.0.10</u>
Net earning	<u>Rs.0.10</u>
Initial Investment	Rs.10.00
Rate of earning (monthly)	1%
Rate of earning (Annual)	12%
	<b>(2 Marks)</b>

**Answer-3 (a) :**

Applying the Black Scholes Formula,  
Value of the Call option now:  
The Formula  $C = SN(d_1) - K_e^{-rt} N(d_2)$

$$d_1 = \frac{\ln(S/K) + (r + \sigma^2/2)t}{\sigma\sqrt{t}}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

Where,

C = Theoretical call premium

S = Current stock price

t = time until option expiration

K = option striking price

r = risk-free interest rate

N = Cumulative standard normal distribution

e = exponential term

$\sigma$  = Standard deviation of continuously compounded annual return.

ln = natural logarithm

$$d_1 = \frac{\ln(1.0667) + (12\% + 0.08)0.5}{0.40\sqrt{0.5}}$$

$$= \frac{0.0646 + (0.2)0.5}{0.40 \times 0.7071}$$

$$= \frac{0.1646}{0.2828}$$

$$= 0.5820$$

(1 Mark)

$$d_2 = 0.5820 - 0.2828 = 0.2992$$

(1 Mark)

$$N(d_1) = N(0.5820)$$

$$N(d_2) = N(0.2992)$$

$$\begin{aligned} \text{Price} &= SN(d_1) - Ke^{-rt} N(d_2) \\ &= 80 \times N(d_1) - (75/1.062) \times N(d_2) \end{aligned}$$

Value of option

$$= 80 N(d_1) - \frac{75}{1.062} \times N(d_2)$$

$$N(d_1) = N(0.5820) = 0.7197$$

$$N(d_2) = N(0.2992) = 0.6176$$

$$\text{Price} = 80 \times 0.7197 - \frac{75}{1.062} \times 0.6176$$

$$= 57.57 - 70.62 \times 0.6176$$

$$= 57.57 - 43.61$$

$$= \text{Rs.}13.96$$

(4 Marks)

#### Teaching Notes:

Students may please note following important point:

Values of N(d1) and N(d2) have been computed by interpolating the values of areas under respective numbers of SD from Mean (Z) given in the question.

It may also be possible that in question paper areas under Z may be mentioned otherwise e.g. Cumulative Area or Area under Two tails. In such situation the areas of the respective Zs given in the question will be as follows:

#### Cumulative Area

Number of S.D. from Mean, (z)	Cumulative Area
0.25	0.5987
0.30	0.6179
0.55	0.7088
0.60	0.7257

#### Two tail area

Number of S.D. from Mean, (z)	Area of the left and right (two tail)
0.25	0.8026

0.30	0.7642
0.55	0.5823
0.60	0.5485

**Answer-3 (b) :**

**No. of the Future Contract to be obtained to get a complete hedge**

$$= \frac{1000 \times \text{Rs.}22 \times 1.5 - 5000 \times \text{Rs.}40 \times 2}{\text{Rs.}1000}$$

$$= \frac{\text{Rs.}3,30,000 - \text{Rs.}4,00,000}{\text{Rs.}1,000} = 70 \text{ contracts}$$

**(1 Mark)**

Thus, by purchasing 70 Nifty future contracts to be long to obtain a complete hedge.

**Cash Outlay**

$$= 10000 \times \text{Rs.} 22 - 5000 \times \text{Rs.} 40 + 70 \times \text{Rs.} 1,000$$

$$= \text{Rs.} 2,20,000 - \text{Rs.} 2,00,000 + \text{Rs.} 70,000 = \text{Rs.} 90,000$$

**(1 Mark)**

**Cash Inflow at Close Out**

$$= 10000 \times \text{Rs.} 22 \times 0.98 - 5000 \times \text{Rs.} 40 \times 1.03 + 70 \times \text{Rs.} 1,000 \times 0.985$$

$$= \text{Rs.} 2,15,600 - \text{Rs.} 2,06,000 + \text{Rs.} 68,950 = \text{Rs.} 78,550$$

**(1 Mark)**

**Gain/ Loss**

$$= \text{Rs.} 78,550 - \text{Rs.} 90,000 = - \text{Rs.} 11,450 \text{ (Loss)}$$

**(1 Mark)**

**Answer-4 (a) :**

Cost of Call and Put Options

$$= (\text{Rs.} 2 \text{ per share}) \times (100 \text{ share call}) + (\text{Rs.} 1 \text{ per share}) \times (100 \text{ share put})$$

$$= \text{Rs.} 2 \times 100 + 1 \times 100$$

$$= \text{Rs.} 300$$

**(2 Marks)**

(i) Price increases to Rs.43. Since the market price is higher than the strike price of the call, the investor will exercise it.

$$\text{Ending position} = (- \text{Rs.} 300 \text{ cost of 2 option}) + (\text{Rs.} 1 \text{ per share gain on call}) \times 100$$

$$= - \text{Rs.} 300 + 100$$

$$\text{Net Loss} = - \text{Rs.} 200$$

**(2 Marks)**

(ii) The price of the stock falls to Rs.36. Since the market price is lower than the strike price, the investor may not exercise the call option.

$$\text{Ending Position:} = (- \text{Rs.}300 \text{ cost of 2 options}) + (\text{Rs.}4 \text{ per stock gain on put}) \times 100$$

$$= - \text{Rs.}300 + 400$$

$$\text{Gain} = \text{Rs.}100$$

**(2 Marks)**

**Answer-4 (b) :**

$$(1 + 0.12) (1 + \text{Risk Premium}) = (1 + 0.14)$$

$$\text{Or, } 1 + \text{Risk Premium} = 1.14/1.12 = 1.0179$$

$$\text{Therefore, Risk adjusted dollar rate is} = 1.0179 \times 1.08 = 1.099 - 1 = 0.099$$

**(2 Marks)**

**Calculation of NPV**

Year	Cash flow (Million) US\$	PV Factor at 9.9%	P.V.
1	2.00	0.910	1.820
2	2.50	0.828	2.070
3	3.00	0.753	2.259
4	4.00	0.686	2.744

5	5.00	0.624	<u>3.120</u>
			12.013
		Less: Investment	<u>11.000</u>
		NPV	<u>1.013</u>

Therefore, Rupee NPV of the project is = Rs. (48 x 1.013) Million  
= Rs.48.624 Million

**(2 Marks)**

**(1 Mark)**

**Answer-4 (c) :**

(i) US \$ required to get Rs. 25 lakhs after 2 months at the Rate of Rs. 47/\$  
∴  $\frac{\text{Rs.25,00,000}}{\text{Rs.47}} = \text{US\$ } 53191.489$

**(1 Mark)**

(ii) Rs. required to get US\$ 2,00,000 now at the rate of Rs. 46.25/\$  
∴ US \$ 200,000 × Rs. 46.25 = Rs. 92,50,000

**(1 Mark)**

(iii) Encashing US \$ 69000 Now Vs 2 month later  
Proceed if we can encash in open mkt \$ 69000 × Rs.46 = Rs. 31,74,000  
Opportunity gain

$$= 31,74,000 \times \frac{10}{100} \times \frac{2}{12}$$

Rs. 52,900

Likely sum at end of 2 months

32,26,900

Proceeds if we can encash by forward rate :

\$ 69000 × Rs.47.00

32,43,000

It is better to encash the proceeds after 2 months and get opportunity gain.

**(3 Marks)**