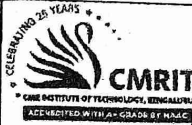


Scheme of Evaluation

CMR INSTITUTE OF TECHNOLOGY		USN						 <small>CELEBRATING 25 YEARS</small> CMRIT <small>CMR INSTITUTE OF TECHNOLOGY, BENGALURU</small> <small>ACCREDITED WITH A+ GRADE BY NAAC</small>		
Internal Assessment Test - III										
Sub:	Financial Derivatives						Code:	20MBAFM402		
Date:	03.08.2022	Duration:	90 mins	Max Marks:	50	Sem:	IV	Branch:	MBA	
Part A - Answer Any Two Full Questions (2* 20 = 40 marks)								Marks	OBE	
									CO	RBT
1 (a)	What do you mean by commodity derivatives?						[03]	CO1	L1	
(b)	Differentiate between equity derivatives and commodity derivatives.						[07]	CO1	L2	
(c)	From the following data, determine for each option, Intrinsic value and time value.									
	Option	Stock price	Exercise price	Option price						
	Put	36	32	5.3						
	Call	48	50	4.1						
	Call	107.5	105	8.40						
Put	41	45	9.7							
2 (a)	Define swaps.						[03]	CO2	L1	
(b)	Write a note on any two commodity exchange in India.						[07]	CO1	L2	
(c)	Two Indian companies Indo - Plas and Indo - car want to raise finance of Rs 500 crores each. They have been offered the following rates by a bank.									
		Fixed rate	Floating rate							
	Indo- plas	12%	MIBOR+70 bps							
Indo-car	11%	MIBOR+30 bps								
								[10]	CO1	L3
Indo-plas wants to raise fixed rate and Indo-car desires floating rate. A bank is willing to arrange for swap for a fee of 10 bps (5 bps from each firm). Design an appropriate swap showing the effect and benefit of swap to the two firms and bank. [Assume swap benefits to be shared equally by firms)										
3 (a)	What is MIBOR?						[03]	CO2	L1	
(b)	What is mean by option? Explain the factors affecting option price.						[07]	CO2	L2	
(c)	The current market price of a share to Rs. 60 and it is believed that at the end of one month the price will be either Rs. 66 or Rs. 54. The risk-free rate of interest is 15% annum. A call option is available with an exercise price of Rs.63 using the Binomial option price model.									
	i) Determine the value of the call option									
	ii) Determine the hedge ratio									
								[10]	CO1	L3
Part B - Compulsory (01*10=10 marks)										
4	From the following data, calculate the values of call and put options using Black and Scholes model.									
	Current price of the share = Rs.486									
	Exercise price = Rs. 500									
	Time to expiration = 65 days									
	Standard deviation (Volatility) $\sigma = 0.54$									
	Continuously compounded Rate of interest = 9% p.a									
Dividend expected = Nil										
								[10]	CO2	L3

Sub:	FINANCIAL DERIVATIVES					Code:	20MBAFM402
Date:	03/08/2022	Duration:	90mins	Max Marks:	50	Sem:	IV
						Branch:	MBA

Note: Part A - Answer Any Two Full Questions (20*02=40 Marks)
 Part B - Compulsory (01*10=10 marks)

Part	Question #	Description	Marks Distribution	Max Marks																	
A	1	a) It is the contract whose value is derived from the underlying commodity that is to be settled on a specific future date.	03 M	20 M																	
		<table border="1"> <tr> <td><u>Equity derivative</u></td> <td><u>Commodity derivative</u></td> </tr> <tr> <td>* Shareholders ownership in the company</td> <td>* Commodity derivatives can be actual physical delivery of index, equity and currency.</td> </tr> <tr> <td>* The amount received after deducting all the liabilities of the company.</td> <td></td> </tr> </table>	<u>Equity derivative</u>		<u>Commodity derivative</u>	* Shareholders ownership in the company	* Commodity derivatives can be actual physical delivery of index, equity and currency.	* The amount received after deducting all the liabilities of the company.		07 M											
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<table border="1"> <tr> <td><u>option</u></td> <td><u>money</u></td> <td><u>Intrinsic Value</u></td> <td><u>TV</u></td> </tr> <tr> <td>Put</td> <td>⊗</td> <td>0</td> <td>5.3</td> </tr> <tr> <td>Call</td> <td></td> <td>0</td> <td>4.1</td> </tr> <tr> <td>Call</td> <td></td> <td>2.5</td> <td>5.9</td> </tr> <tr> <td>Put</td> <td></td> <td>4</td> <td>5.2</td> </tr> </table>	<u>option</u>	<u>money</u>	<u>Intrinsic Value</u>	<u>TV</u>	Put	⊗	0	5.3	Call		0	4.1	Call		2.5	5.9	Put		4	5.2	10 M
<u>option</u>	<u>money</u>	<u>Intrinsic Value</u>	<u>TV</u>																		
Put	⊗	0	5.3																		
Call		0	4.1																		
Call		2.5	5.9																		
Put		4	5.2																		
2	a)	It is a derivative contract through which two parties exchange the cash flows or liabilities from two different financial instruments	03 M	20 M																	
	b)	① Multi Commodity Exchanges of India (MCEI), Mumbai ② National Commodity and Derivatives Exchange of India (NCDEX), Mumbai.	07 M																		

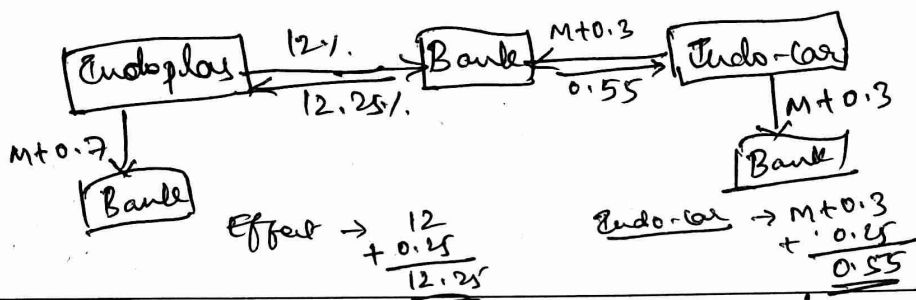
③ National multi-commodity Exchanges (NMCE) Ahmedabad.

④ Indian Commodity Exchange (ICE), New Delhi

	<u>Fixed</u>	<u>Floating</u>	
Endo-phas	12%	M+0.7	0.4
Endo-cas	11%	M+0.3	0.6
	<u>1.1%</u>	<u>0.4%</u>	
		→ 5B →	0.1
			0.5
			0.15 0.25

c)

10 M



MIBOR → Mumbai Interbank Offer Rate,

a)

03 M

The rate is used for forward contracts and floating rate debentures.

A contract that gives the buyer the right but no the obligation to buy or sell the underlying assets.

b)

07 M

Determinants → Spot price, Strike price, Time to expiration, Implied Volatility, Expected Dividends, Interest rate, Repo rate.

3

20 M

$$i = 1 + r_f = 1 + \frac{0.15 \times 1}{12} = 1 + 0.0125 = \underline{1.0125}$$

$$u = S_1/S_0 = 66/60 = \underline{1.1}$$

$$d = 54/60 = \underline{0.9}$$

c)

$$C_u = \max(0, S_1 - E) = \max(0, 66 - 63) = \underline{3}$$

$$C_u = \underline{3}$$

$$C_d = \max(0, 54 - 63) = \underline{0}$$

$$C = \frac{C_u(i-d)}{u-d} + \frac{C_d(u-i)}{u-d}$$

$$= \frac{3(1.0125 - 0.9)}{1.1 - 0.9} + \frac{0(1.1 - 1.0125)}{1.1 - 0.9} = \frac{0.0375}{0.2} = \underline{1.875}$$

$$C = \underline{1.625}$$

$$d = \underline{0.25 \text{ p.s.}}$$

10 M

Call option!

$$C = S_0 N(d_1) - E \cdot e^{-rt} N(d_2)$$

$$d_1 = \frac{\ln(S_0/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$$

$$d_1 = \frac{\ln(486/500) + (0.09 + 0.5(0.54)^2)0.1781}{0.54\sqrt{0.1781}} = \underline{\underline{0.06}}$$

$$N(d_1) = N(0.06) = \underline{\underline{0.5239}}$$

$$d_2 = d_1 - \sigma\sqrt{t} = 0.06 - 0.2278 = \underline{\underline{-0.17}}$$

$$N(d_2) = N(-0.17) = \underline{\underline{0.4325}}$$

$$\begin{aligned} C &= 486 \times 0.5239 - 500 \cdot e^{-0.09 \times 0.1781} \times 0.4325 \\ &= 254.62 - 500 \times 0.9841 \times 0.4325 \\ C &= 254.62 - 212.81 = \boxed{41.81} \end{aligned}$$

Put option : $P = C + E \cdot e^{-rt} - S_0$

$$= 41.81 + 500 \times 0.9841 - 486$$
$$P = \boxed{47.86}$$

B

4

A

10 M

10 M



Los
4/8/2022