

# Scheme of Evaluation

## Internal Assessment Test - I

Sub:	Financial Derivatives					Code:	20MBAFM402
Date:	06.07.2023	Duration:	90min	Max Marks:	50	Sem:	IV
						Branch:	MBA

### SET - I

#### Part A - Answer Any Two Full Questions (2\*20 = 40 marks)

	Marks	OBE													
		CO	RBT												
1 (a) Define derivatives with an example?	[03]	CO1	L1												
(b) Explain the factors contributing the growth of derivatives.	[07]	CO1	L2												
(c) Assume that a market capitalization weighted index contains only three stocks A, B and C as shown below. The current value of the index is 1056. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Company</th> <th>Share Price (Rs.)</th> <th>Market Capitalization (Rs. crores)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>120</td> <td>12</td> </tr> <tr> <td>B</td> <td>50</td> <td>30</td> </tr> <tr> <td>C</td> <td>80</td> <td>24</td> </tr> </tbody> </table> Calculate the price of a futures contract with expiration on 60 days on this index if it is known that 25 days from today, Company A would pay a dividend of Rs.8 per share. Take the risk-free rate of interest to be 15% per annum. Assume the lot size to be 200 units.	Company	Share Price (Rs.)	Market Capitalization (Rs. crores)	A	120	12	B	50	30	C	80	24	[10]	CO2	L3
Company	Share Price (Rs.)	Market Capitalization (Rs. crores)													
A	120	12													
B	50	30													
C	80	24													

2 (a) What do you meant by index arbitrage?	[03]	CO2	L1																		
(b) Share Y is currently selling at Rs.75. the risk-free rate of interest is 9% per annum. What should be the fair contract price of a two-month future contract?	[07]	CO2	L3																		
(c) Assume that a Stock Index consists of 5 stocks. Currently the index stands at 970/-. Obtain the price of a future contract with expiration in 115 days on this index having references to the following additional information. a. Dividend of Rs 6/- per share is expected on share 'B', 20 days from now. b. Dividend of Rs 3/- per share is expected on share 'E', 28 days from now. c. Continuous compounding risk free rate is 8%. d. Lot size is 300 units. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Company</th> <th>Share Price</th> <th>Market Capitalization</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>22</td> <td>110</td> </tr> <tr> <td>B</td> <td>85</td> <td>170</td> </tr> <tr> <td>C</td> <td>124</td> <td>372</td> </tr> <tr> <td>D</td> <td>54</td> <td>216</td> </tr> <tr> <td>E</td> <td>25</td> <td>200</td> </tr> </tbody> </table>	Company	Share Price	Market Capitalization	A	22	110	B	85	170	C	124	372	D	54	216	E	25	200	[10]	CO2	L3
Company	Share Price	Market Capitalization																			
A	22	110																			
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E	25	200																			

3 (a) What is hedging using futures?	[03]	CO1	L1
(b) Explain the features of future contract.	[07]	CO1	L2
(c) Consider a six months forward contract on 100 shares with a price of Rs.38 each. i. The continuously compounded risk-free rate is 10% p.a. The share yields dividend of Rs.1.50 in 4 months. Find the value of forward contract. ii. Assume that dividend income worth Rs.150 is expected after 3 months and also after 6 months then illustrate the value of contract.	[10]	CO2	L4

#### Part B - Compulsory (01\*10=10 marks) – CASE STUDY

4	An investor took short position in 10 futures contracts of commodity at an excise price of Rs. 28.75/kg. The size of one future contract is 100kg. The initial margin for this contract is 20% and the maintenance margin is 85% of initial margin. The future price for the 1 <sup>st</sup> 10 days of the contract is given below prepare a margin account for the 1 <sup>st</sup> 10 days assuming that all margin calls are honored immediately										10	CO2	L4	
	Days	1	2	3	4	5	6	7	8	9				10
	Price	28.9	29.75	29.10	28.85	29.65	30.15	31.25	31.50	32.25				31.60

Course Outcomes (COs)		PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1:	Understand the mechanism of forwards/futures, options, financial swaps, various credit derivatives and VaR with their features, merits and demerits.	1a, 1b	1c,	-	-	-	1a, 1b	1c,	-	-
CO2:	Understand the mechanism of forwards/futures, options, financial swaps, various credit derivatives and VaR with their features, merits and demerits.	2a, 3a	2b, 2c,3c,4	-	-	-	2a,3a	2b, 2c, 3c, 4	-	-
CO3:	Application of financial derivatives in risk management.	-	-	-	-	-	-	-	-	-
CO4:	Critically evaluate various financial derivatives.	-	-	-	-	-	-	-	-	-

Cognitive level	KEYWORDS
L1 - Remember	list, define, tell, describe, recite, recall, identify, show, label, tabulate, quote, name, who, when, where, etc.
L2 - Understand	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss
L3 - Apply	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify
L4 - Analyze	classify, outline, break down, categorize, analyze, diagram, illustrate, infer, select
L5 - Evaluate	asses, decide, choose, rank, grade, test, measure, defend, recommend, convince, select, judge, support, conclude, argue, justify, compare, summarize, evaluate
L6 - Create	design, formulate, build, invent, create, compose, generate, derive, modify, develop, integrate

**PO1–Theoretical Knowledge; PO2–Foster Analytical and Critical Thinking Abilities for data based decision making; PO3– Develop Value Based Leadership; PO4 –Ability to Understand and communicate various business aspects to global; PO5 – Ability to lead themselves and others in the achievement of organizational goals contributing effectively to a team environment;**  
**PSO1- Comprehend Contemporary features of Business Management Science and its administration**  
**PSO2- Analyze and interpret the dynamic situations for making Business Management strategies**  
**PSO3- Handle responsibility with the ethical values for all actions undertaken by them**  
**PSO4- Adapt and focus on achieving the organizational goal and objectives with complete zeal and commitment.**

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 26/6/2023  
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**CMR  
INSTITUTE OF  
TECHNOLOGY**

**SCHEME OF EVALUATION  
Internal Assessment Test 1 - July 2023**

<b>Sub:</b>	<b>Financial Derivatives - 20MBAFM402</b>						<b>Code:</b>	CR	
<b>Date:</b>	06-07-2023	<b>Duration:</b>	90min	<b>Max Marks:</b>	50	<b>Sem:</b>	IV	<b>Branch:</b>	MBA

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

Part	Question #	Description	Marks	Max Marks
<b>A</b>	1 a)	Derivatives are financial instruments that derive their value from an underlying asset, index or reference rate. Ex: Futures, options, swaps.	3	20 M
	b)	<p><u>Factors contributing growth of derivatives.</u></p> <ul style="list-style-type: none"> <li>* Price volatility,</li> <li>* Globalization of the market</li> <li>* Technological Advances</li> <li>* Advances in financial theories</li> <li>* Innovations in derivative markets</li> <li>* Development of more sophisticated risk management tools.</li> </ul>	7	
	c)	<p>Ⓐ weight of comp. <math>\rightarrow \frac{12}{66} = 18\%</math></p> <p>Ⓑ value in index <math>\rightarrow 1056 \times 0.18 = \underline{190.08}</math></p> <p>Ⓒ No. of shares <math>\rightarrow \frac{190.08}{120}</math> <math>= \underline{1.584}</math> shares</p> <p>Ⓓ Dividend <math>\rightarrow 1.584 \times 8 = \underline{12.672}</math></p> <p><math>I = D \cdot e^{-rt} \rightarrow 12.672 - (0.1398 \times \frac{25}{365})</math></p> <p><math>I = \underline{12.55}</math></p> <p><math>F = (S_0 - I) e^{rt} = (1056 - 12.55)^{0.1398 \times \frac{60}{365}}</math></p> <p><math>F = 1067.70 \times 200 = \underline{2,13,540} \text{ ₹}</math></p>	10	

2	a)	<p>Index arbitrage is a trading strategy that attempts profit from the price differences between two or more market indexes.</p>	3	
	b)	$cost = \ln(1 + 0.09) = 0.0862$ $F = S_0 \cdot e^{rt}$ $F = 75 \cdot e^{(0.0862 \times 2/12)}$ $F = \underline{\underline{776.09}}$	7	
	c)	<p><u>Company - B:</u></p> <p>Ⓐ weight <math>\rightarrow 170/1068 = 0.1592</math></p> <p>Ⓑ value of stock <math>\rightarrow 0.1592 \times 970 = \underline{\underline{154.42}}</math></p> <p>Ⓒ No. of shares <math>= \frac{154.42}{85} = \underline{\underline{1.817}}</math></p> <p>Ⓓ Dividend <math>= 1.817 \times 6 = \underline{\underline{10.902}}</math></p> $I_B = 10.902 \cdot e^{-0.08 \times 20/365}$ $I_B = \underline{\underline{10.854}}$ <p><u>Company - E</u></p> <p>Ⓐ weight <math>= 200/1068 = 0.187</math></p> <p>Ⓑ value of stock <math>= 0.187 \times 970 = 181.39</math></p> <p>Ⓒ No. of shares <math>= 181.39/25 = \underline{\underline{7.256}}</math></p> <p>Ⓓ Dividend <math>= 7.256 \times 3 = \underline{\underline{21.768}}</math></p> $I_E = 21.635$ $I = I_B + I_E = \underline{\underline{32.489}}$ $F = (S_0 - I) e^{rt} = (970 - 32.489) e^{0.08 \times 115/365}$ $F = 961.436 \times 300 = \underline{\underline{288,431}}$	20 M	10

3	<p>a) A long position is the buying of a stock, commodity or currency with the expectation that will rise in value in the future.</p>	3	20 M
	<p>b) <u>features of futures contract:</u></p> <ul style="list-style-type: none"> <li>→ Traded on Organized exchange</li> <li>→ Seller can change delivery date</li> <li>→ Mark to Market Cash Management             <ul style="list-style-type: none"> <li>* On a daily basis</li> <li>* Reduces the risk of default</li> </ul> </li> </ul>	7	
	<p>c)</p> <p>① <math>f = (S_0 - I) e^{rt}</math></p> $I = 1.50 \cdot e^{-(0.1 \times 4/12)} = \underline{1.4508}$ $F = (38 - 1.4508) e^{0.1 \times 6/12}$ $F = 36.549 \cdot e^{0.05}$ $F = \underline{38.4229} \times 100 = \underline{3842.29}$ <p>② <u>I if dividend received after 3m</u></p> $I = 1.5 \cdot e^{-0.1 \times 3/12}$ $F = 1.5 \times 0.9753 = \underline{1.4629}$ <p>③ <u>I if dividend 150 received after 6m</u></p> $I = 150 \cdot e^{-0.1 \times 6/12} = 0.951229$ $I = 142.68$ $\text{Total } I = 146.29 + 142.68 = 288.97$ $F = (3800 - 288.97) \cdot e^{0.1 \times 6/12}$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <math>F = 3,691.14</math> </div>	10	

4 a)

Position = short  
 Value of contract =  $28.75 \times 10 \times 100 = 28750$   
 Initial margin =  $20\% \times 28750 = 5750$   
 Maintenance margin =  $85\% \times 5750 = \underline{4888}$

Day	Price	Daily Gain/Loss	Marginal Balance	Margin Call
1	28.9	$(28.75 - 28.9) \times 1000 = (150)$	5600	-
2	29.35	(850)	4750	1000
3	29.10	650	6400	-
4	28.85	250	6650	-
5	29.65	(800)	5850	-
6	30.15	(500)	5350	-
7	31.25	(1100)	4250	1500
8	31.5	(250)	5500	-
9	32.25	(750)	4750	1000
10	31.60	650	6400	-

10 10M

Margin call on day 2, 7 and 9

\_\_\_\_\_ 0 \_\_\_\_\_ 0 \_\_\_\_\_

**B**