PGDM, 2015-17

Derivatives and Risk Management

DM-413

Trimester – IV, End-Term Examination: September 2016

Time Allowed: 2 Hrs 30 mins **Max Marks: 50**

Sec A

(Answer any three questions out of five. Each question carries five marks)

1. On 15-02-15, at the open of the CBOT, you went long one March 2016 gold futures contract. Here were the prices for gold futures contracts traded Chicago Board of Trade on 15- 02-15:

	Open	Day's High	Day's Low	Close
March 2016 GBP	356.02	358.14	356.02	357.80
March 2015 GBP	356.90	357.80	356.80	357.60

The initial margin per gold futures contract was $1,225 and the maintenance margin was $1,000. Each gold futures calls for delivery of 100 troy ounces of gold.

a. Assume it cost you $17.50 in brokerage fees to buy the contract, and $17.50 to close your position. If you closed out your position at the market close on 15-02-15, how much did you gain or lose between on 15-02-15? Explain.

b. Detail all the cash-flows that you paid or received on that day. Explain briefly.

2. Explain carefully the difference between hedging, speculation and arbitrage.

3. Suppose that you own 5000 shares worth of INR 30 each. How can a put option be used to provide you with insurance against a decline in the value of your holding over the next three months.

4. A trader writes a December put option with a strike of INR 30. The price of option is INR 4.00. Under what circumstances does the trader make a gain?

5. 'Speculation in futures market is pure gambling. It is not in the public interest to allow speculators to trade on a futures exchange'. Explore this viewpoint.

Sec B

(Answer any two questions out of three. Each question carries ten marks)

6. Suppose that a March call option to buy a share for INR 50 costs INR 2.50 and is held till March. Under what circumstances will the holder of the option make a profit? Under what circumstances will the option be exercised? Draw a diagram illustrating how the profit from a long position in the option depends on the stock price at maturity of the option. (10 marks)

7. A stock price is currently INR 70. It is known that at the end of 4 month it will be either INR 60 or INR 80. If the risk free interest rate is 15% with continuous compounding, what is the value of 6-month European option with a strike price of INR 68? (10 marks)

8. Company A and B have been offered the following rates per annum on a 100 lacs rupee loan for 5 years.

	Fixed Rate	Floating Rate
Company A	12%	MIBOR + 0.1%
Company B	14.5%	MIBOR + 0.9%

Company A requires a floating rate loan; company B requires a fixed rate loan. Design a swap that will net a bank, acting as intermediary, 0.1% per annum and that will appear equally attractive to both the companies. (10 marks)

Sec C

(Compulsory)

9. Please refer the attached option chain at National Stock Exchange (NSE) as on 2nd September, 2016. As you notice, the spot Nifty is 8784.35. With reference to the given option chain, answer the following questions:

a) How would you construct Bull Call Spread strategy at strike(s) of 8400 and 9000?

b) Find out its cost, payoff, break-even point and the maximum loss

c) What would be the profit/loss is after 1 month the index value were i) 8500 ii) 8900

d) Draw a complete diagram for the abovementioned Bull Call Spread strategy.

(15 marks)

(All prices in ₹)

Option Chain (Equity Derivatives)

Underlying Index: **NIFTY 8784.40** As on Sep 02, 2016 12:01:09 IST

View Options Contracts for: NIFTY OR Search for an underlying stock: GO Filter by: Expiry Date 29SEP2016 Futures contracts

	CALLS											PUTS										
Chart	OI	Chng in OI	Volume	IV	LTP	Net Chng	Bid Qty	Bid Price	Ask Price	Ask Qty	Strike Price	Bid Qty	Bid Price	Ask Price	Ask Qty	Net Chng	LTP	IV	Volume	Chng in OI	OI	Chart
	2,550	-	-	-	-	-	1,200	4,175.70	4,194.50	75	4600.00	75	0.05	3.00	75	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	4,018.75	4,134.00	2,025	4700.00	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	3,918.75	4,034.00	2,025	4800.00	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	3,821.25	3,934.00	2,025	4900.00	-	-	-	-	-	-	-	-	-	-	
	44,850	-	5	-	3,788.45	0.80	1,275	3,777.05	3,791.10	75	5000.00	4,800	0.10	1.00	750	-	-	-	-	-	12,600	
	-	-	-	-	-	-	2,025	3,623.75	3,734.00	2,025	5100.00	-	-	-	-	-	-	-	-	-	-	
	825	-	-	-	-	-	2,025	3,523.75	3,634.00	2,025	5200.00	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	3,426.25	3,534.00	2,025	5300.00	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	3,326.25	3,434.00	2,025	5400.00	-	-	-	-	-	-	-	-	-	-	
	37,950	-	-	-	-	-	75	3,276.40	3,298.15	150	5500.00	150	0.10	1.00	750	-	-	-	-	-	2,850	
	-	-	-	-	-	-	2,025	3,128.75	3,234.00	2,025	5600.00	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	3,031.25	3,134.00	2,025	5700.00	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	2,931.25	3,034.00	2,025	5800.00	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	2,833.75	2,934.00	2,025	5900.00	-	-	-	-	-	-	-	-	-	-	
	142,275	-	4	-	2,780.15	-7.50	2,700	2,785.00	2,796.95	75	6000.00	300	0.35	0.60	300	-	-	-	-	-	81,825	
	-	-	-	-	-	-	2,700	2,657.10	2,734.00	2,025	6100.00	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	2,536.25	2,634.00	2,025	6200.00	3,000	0.20	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	2,438.75	2,534.00	2,025	6300.00	3,000	0.20	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	2,025	2,338.75	2,434.00	2,025	6400.00	300	0.35	-	-	-	-	-	-	-	-	
	70,350	75	2	-	2,270.30	-15.95	1,275	2,287.15	2,302.30	75	6500.00	150	0.60	0.90	150	-	-	-	-	-	8,925	
	113,175	-	-	-	-	-	1,275	2,188.75	2,204.20	675	6600.00	750	0.70	1.00	750	-	-	-	-	-	5,400	
	56,625	-	-	-	-	-	150	2,086.85	2,111.50	2,625	6700.00	300	0.60	1.40	1,800	-	-	-	-	-	450	
	43,500	-	-	-	-	-	150	1,973.60	2,017.15	150	6800.00	150	0.70	0.90	150	-	-	-	-	-	5,775	
	-	-	-	-	-	-	1,500	1,893.55	1,984.00	1,500	6850.00	5,025	0.05	-	-	-	-	-	-	-	-	
	102,525	-	-	-	-	-	1,200	1,890.35	1,906.05	150	6900.00	150	0.80	1.35	150	-	-	-	-	-	3,975	
	-	-	-	-	-	-	1,500	1,796.05	1,884.00	1,500	6950.00	5,025	0.05	-	-	-	-	-	-	-	-	
	977,025	-150	16	-	1,800.00	7.45	75	1,798.00	1,800.95	75	7000.00	825	1.20	1.25	8,100	-0.10	1.20	33.73	36	-675	311,775	
	-	-	-	-	-	-	1,500	1,696.05	1,784.00	1,500	7050.00	5,025	0.05	-	-	-	-	-	-	-	-	
	123,525	-75	1	-	1,698.00	-23.05	75	1,692.35	1,703.05	75	7100.00	75	1.30	1.35	2,850	-0.15	1.30	32.17	176	-75	287,850	
	-	-	-	-	-	-	1,500	1,598.55	1,684.00	1,500	7150.00	5,025	0.05	-	-	-	-	-	-	-	-	
	134,625	-75	3	-	1,593.00	-24.15	75	1,592.90	1,600.00	75	7200.00	75	1.35	1.40	3,375	-	1.35	30.46	50	1,350	531,450	
	-	-	-	-	-	-	1,500	1,498.55	1,584.00	1,500	7250.00	5,025	0.15	-	-	-	-	-	-	-	-	
	115.500	-	5	-	1,505.00	20.00	1,200	1,493.75	1,501.95	75	7300.00	750	1.60	1.65	675	-	1.70	29.42	9	-150	166.875	
	-	-	-	-	-	-	1,500	1,401.05	1,484.00	1,500	7350.00	5,025	0.15	-	-	-	-	-	-	-	-	
	131,775	5,175	72	-	1,401.55	4.80	75	1,395.85	1,402.95	75	7400.00	675	1.85	1.90	900	-0.30	1.85	27.86	144	75	334,200	
	-	-	-	-	-	-	1,500	1,301.05	1,384.00	1,500	7450.00	5,025	0.35	-	-	-	-	-	-	-	-	
	645,600	-3,975	106	-	1,301.00	6.70	75	1,298.15	1,305.65	75	7500.00	2,550	2.40	2.45	9,750	-	2.40	26.96	588	3,675	1,853,550	
	-	-	-	-	-	-	1,500	1,203.55	1,284.00	1,500	7550.00	5,025	0.35	-	-	-	-	-	-	-	-	
	68,925	-	2	-	1,200.00	2.60	75	1,196.05	1,206.65	600	7600.00	2,100	2.50	2.60	5,625	-0.10	2.55	25.19	245	600	421,725	
	-	-	-	-	-	-	1,500	1,103.55	1,184.00	1,500	7650.00	5,025	0.35	-	-	-	-	-	-	-	-	
	79,500	-	-	-	-	-	75	1,098.35	1,107.85	75	7700.00	2,550	2.80	2.85	825	0.05	2.85	23.66	136	-1,275	710,775	
	-	-	-	-	-	-	1,500	1,006.05	1,084.00	1,500	7750.00	5,025	0.35	-	-	-	-	-	-	-	-	
	438,900	-	1	-	996.00	2.45	75	1,000.60	1,008.40	300	7800.00	1,275	3.25	3.30	3,600	0.05	3.30	22.17	983	-25,650	1,148,325	
	-	-	-	-	-	-	1,500	906.05	984.00	1,500	7850.00	7,500	1.65	-	-	-	-	-	-	-	-	
	195,375	300	7	-	904.20	3.75	300	902.15	909.60	75	7900.00	2,325	4.35	4.40	3,825	-0.20	4.35	21.17	638	6,975	520,050	
	-	-	-	-	-	-	1,500	808.55	884.00	1,500	7950.00	7,500	3.15	-	-	-	-	-	-	-	-	
	1,674,300	-11,025	228	-	813.00	7.65	150	805.10	810.70	600	8000.00	675	5.85	5.90	1,500	-0.70	5.85	20.21	4,505	-17,100	2,745,375	
	75	-	-	-	-	-	1,500	712.00	877.00	300	8050.00	8,550	3.45	-	-	-	-	-	-	-	75	
	653,400	-35,325	524	-	717.00	12.50	150	707.30	715.05	225	8100.00	1,650	7.25	7.35	2,175	-0.55	7.30	18.88	2,355	-25,950	1,023,825	
	600	-	-	-	-	-	5,250	624.20	691.35	5,250	8150.00	975	8.00	9.55	150	1.45	9.00	18.51	21	1,050	18,075	
	707,250	-54,075	778	-	618.00	11.65	75	610.75	616.15	375	8200.00	975	9.85	9.95	825	-0.65	9.95	17.77	4,131	32,700	2,238,975	
	2,025	-	-	-	-	-	5,100	527.70	595.95	5,400	8250.00	75	11.55	11.95	2,625	-0.35	11.90	17.31	123	1,125	86,325	
	445,575	-750	23	-	518.00	4.20	75	515.40	520.70	300	8300.00	1,350	14.20	14.35	300	-0.70	14.35	16.90	5,438	4,350	3,119,625	
	825	-	-	-	-	-	150	452.40	496.60	3,450	8350.00	1,950	17.10	17.75	150	-0.95	17.35	16.46	87	150	98,025	

	1,410,225	4,200	484	-	339.65	4.30	150	335.05	338.80	75	8500.00	675	32.05	32.20	600	-0.95	32.20	15.41	24,585	45,975	6,602,925	
	28,875	-1,950	33	-	296.35	4.40	150	291.20	297.00	75	8550.00	450	38.90	39.70	1,725	-1.20	39.20	15.06	606	-1,050	215,250	
	1,852,800	-14,175	2,250	7.46	252.10	2.60	225	251.95	253.65	150	8600.00	375	48.20	48.40	525	-0.95	48.40	14.79	35,018	391,800	6,512,475	
	170,625	-1,575	225	8.40	215.60	4.15	825	213.30	215.10	225	8650.00	150	58.85	59.45	300	-0.80	59.20	14.43	1,558	21,150	417,675	
	3,033,825	-26,550	7,520	9.00	179.25	1.95	75	179.45	179.95	75	8700.00	150	72.35	72.50	225	-1.45	72.50	14.20	37,516	455,100	4,221,150	
	137,025	-7,650	484	9.08	146.00	1.60	450	145.20	147.05	375	8750.00	150	88.25	88.95	300	-1.45	88.70	14.01	2,262	19,875	289,875	
	3,537,900	153,600	39,527	9.46	116.45	0.75	675	116.35	116.80	450	8800.00	225	107.65	107.95	450	-1.65	108.30	13.82	41,498	253,050	3,114,300	
	297,900	13,800	1,599	9.49	91.55	0.65	75	90.55	91.35	825	8850.00	75	130.05	131.60	375	-3.35	130.60	13.83	370	-3,300	58,050	
	4,781,925	196,575	39,550	9.62	69.10	0.10	375	69.05	69.30	300	8900.00	150	157.55	158.40	150	2.55	158.40	13.72	6,742	-38,325	857,850	
	231,450	13,875	599	9.61	51.10	-0.75	2,250	50.90	51.50	150	8950.00	75	187.50	189.60	225	5.15	186.35	13.69	21	-150	5,775	
	5,923,575	92,475	29,360	9.78	37.70	-0.65	900	37.55	37.70	225	9000.00	375	222.50	224.55	375	-4.25	223.75	14.28	1,721	14,400	1,527,900	
	176,625	-2,625	337	9.83	26.75	-0.75	1,725	26.40	26.80	75	9050.00	3,300	218.60	268.00	75	-8.45	266.00	15.18	1	-	525	
	2,925,975	95,175	20,198	9.92	18.65	-0.85	975	18.70	18.80	750	9100.00	75	300.95	306.40	300	-0.35	303.80	15.60	322	1,500	187,125	
	86,175	9,375	411	9.87	12.40	-0.95	150	12.40	12.90	150	9150.00	4,950	301.85	371.80	4,950	-	-	-	-	-	-	
	1,847,475	61,875	12,314	10.02	8.60	-0.70	975	8.55	8.60	225	9200.00	75	389.00	393.30	75	-10.80	387.10	15.59	281	-4,050	254,175	
	10,500	825	14	10.23	6.00	-0.85	150	5.20	6.45	150	9250.00	5,250	396.25	451.20	3,825	-	-	-	-	-	-	
	835,650	-12,375	4,545	10.25	3.90	-0.60	900	3.85	3.90	6,750	9300.00	75	481.65	487.75	75	0.10	485.00	18.52	3	-	9,075	
	75	-	-	-	-	-	150	1.90	4.85	150	9350.00	150	483.85	551.05	2,850	-	-	-	-	-	-	
	387,525	525	2,132	10.90	2.10	-0.45	11,250	2.05	2.15	8,625	9400.00	375	576.20	585.40	75	-	-	-	-	-	4,800	
	6,750	975	82	11.30	1.65	-0.60	2,850	1.60	1.75	2,550	9450.00	2,775	613.15	656.40	5,400	-	-	-	-	-	-	
	586,725	11,250	636	11.85	1.45	-0.25	8,250	1.40	1.45	225	9500.00	75	675.50	680.65	225	-7.85	674.70	21.61	139	7,650	688,425	
	-	-	-	-	-	-	10,050	0.05	-	-	9550.00	1,500	681.00	756.45	1,500	-	-	-	-	-	-	
	57,975	-	35	13.08	1.25	-0.20	675	1.20	1.30	1,650	9600.00	75	773.40	780.10	75	-	-	-	-	-	6,900	
	-	-	-	-	-	-	-	-	-	-	9650.00	1,500	781.00	856.45	1,500	-	-	-	-	-	-	
	78,900	-	-	-	-	-	300	0.75	1.35	1,125	9700.00	150	869.25	891.15	75	-	-	-	-	-	2,025	
	-	-	-	-	-	-	-	-	-	-	9750.00	1,500	878.50	956.45	1,500	-	-	-	-	-	-	
	118,125	-	-	-	-	-	3,000	0.95	1.35	1,500	9800.00	1,200	970.10	998.10	375	-	-	-	-	-	1,500	
	-	-	-	-	-	-	-	-	-	-	9850.00	1,500	978.50	1,056.45	1,500	-	-	-	-	-	-	
	28,350	-	-	-	-	-	150	0.75	1.25	675	9900.00	1,200	1,069.15	1,085.20	3,675	-	-	-	-	-	300	
	-	-	-	-	-	-	-	-	-	-	9950.00	1,500	1,076.00	1,156.45	1,500	-	-	-	-	-	-	
	657,375	6,750	105	17.93	0.90	-0.05	4,275	0.90	0.95	6,900	10000.00	150	1,171.10	1,178.85	1,200	-5.45	1,176.00	33.41	18	150	351,975	
	-	-	-	-	-	-	-	-	-	-	10050.00	1,500	1,176.00	1,256.45	1,500	-	-	-	-	-	-	
	2,850	-	1	16.11	0.15	-0.60	525	0.15	1.00	150	10100.00	150	1,266.35	1,306.05	75	-11.20	1,264.65	32.47	2	75	4,950	
	-	-	-	-	-	-	-	-	-	-	10150.00	1,500	1,273.50	1,356.45	1,500	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	1.95	1,500	10200.00	75	1,323.70	1,406.05	375	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	10250.00	1,200	1,216.00	1,665.50	75	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	1.95	1,500	10300.00	2,025	1,423.50	1,506.25	2,025	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	1.95	1,500	10400.00	2,025	1,521.00	1,606.25	2,025	-	-	-	-	-	-	
	1,650	-	-	-	-	-	-	-	1.50	1,500	10500.00	375	1,622.85	1,684.00	2,400	-	-	-	-	-	9,150	
	-	-	-	-	-	-	-	-	-	-	10600.00	2,025	1,718.50	1,806.25	2,025	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	3.05	75	10700.00	3,825	1,841.10	1,900.35	3,825	-	-	-	-	-	-	
Total	36,965,700		164,419																187,455		45,530,925	Total

Top

Note : 10% interest rate is applied while computing implied volatility.

Highlighted options are in-the-money.

NSE group companies NSCCL NSETECH IISL DotEx NSE.IT NSICL

Follow NSE

Copyright © 2014 National Stock Exchange of India Ltd. All rights reserved. Best viewed in IE8+ and 1024 x 768 resolution.

Terms of Use | Disclaimer | Sitemap