

Department of Management
Semester End Examination
MBA-4th Semester [2017-2018]

Course Name: Financial Derivative
Course Code: MBA-FM-07

Max Marks: 75
Time: 03:00 Hr

Instructions:

1. Attempt only five questions.
2. Students are allowed to use scientific calculator.

Q1: Calculate the following options on a single stock

[15]

Particulars	Calls		Put
	A	B	C
Month of expiration	6	9	6
Continuously yearly Risk Free rate R_f (Treasury Bills)	8.5%	8.5%	8.5%
Discrete Yearly R_f	11.82%	11.82%	11.82%
Standard deviation of stock Return	30%	30%	30%
Exercise Price	Rs. 50	Rs. 50	Rs. 50
Option Price	Rs. 1.5	-----	Rs. 5.16
Stock price	Rs. 45	Rs. 45	Rs. 45
Cash Dividend	Rs. 00	Rs. 00	Rs. 00

- I Why should Call B sell for more than Call A?
- II Is the Put-Call parity model working for options A and C?
- III How would you trade Call A, the stock and risk free security in order to replicate the expiration date outcome at put C?
- IV Calculate the Black-Scholes valuation of Call A and Call B

Q2: (a) Calculate the value of option on the basis of one step binomial tree. In which stock price of option is Rs. 100 and it goes up and down on the basis of 10% of stock price of option. Life of option is of three months and risk free interest rate is about 9%, during the life of option small change in time will be calculated as 0.456. [10]

(b) What do you mean by convertible debenture? [05]

Q3: (a) what do you mean by currency coupon Swaps. [05]

- (b) Suppose that the term structure of interest rate is flat in both Japan and the United States. The Japanese rate is 4% per annum and the U.S rate is 9% per annum (Both with continuous compounding). A financial institution has entered into a currency in which it receives 5% per annum in Yen and pays 8% per annum in dollar once a year. The principal in the two currencies are \$10 million and 1200 million Yen. The swap will last for another three years and the currency exchange rate is 110 yen = \$1 (where $k = \$0.8$ million and $K^* = 60$ million Yen). Calculate value of currency swaps. [10]

- Q4: (a) What are the three golden rules for warrants? [05]
 (b) $H_F = e^{-(r-r_f)T} H_F^*$; what is the use of this formula. [05]
 (C) Assume that the base value of a market capitalization weighted index was 4000 and the base value market capitalizations are Rs. 1,40,000 Crore. If the current market capitalization is Rs. 1,80,000 Crore. What is the value of Index at that position? [05]
- Q5: (a) Define the relationship between Δ , θ and γ . [05]
 (b) A U.S Bank has sold six month put option of £ 1 million with a strike price of 16000 and wishes to make its portfolio delta neutral. Suppose that the current exchange rate is 16200, the risk free interest rate in the United Kingdom is 13% per annum, the risk free interest rate in the United State is 10% per annum and the volatility of the sterling is 15%. (In this case $d_1=0.0287$) [10]
- Q6: (a) What do you mean by "Marking to Market"? [05]
 (b) An Investor writes five call options contract on a stock. The option price is Rs. 10, the strike price is Rs. 50 and the stock price is Rs. 44. Calculate margin money of the option (Margin Amount 25%, Lot size 200) [05]
 (c) Suppose the company ACC Ltd. traded at 2000 in the cash market and three month ACC Ltd. future contract at 2080. If the transaction cost involved are 0.6. What is the arbitrage possible return? [05]
- Q7: (a) Explain the definition of derivative on the basis of SCR (Act) 1956 [05]
 (b) Give short overview of various derivative products popular in India and outside India. [05]
 (C) What do you mean by "Systemic Risk"? [05]
- Q8: (a) What is the basic difference between Futures and Options contract? [05]
 (b) How you calculate the effect of volatility change over time in the valuation of derivative contract? [05]
 (c) What are the various factors driving the growth of derivative market? [05]

TABLE 1. Areas under the normal curve between z and $z + d$, where z is the positive value of d . Areas for negative values of d obtained by symmetry.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0674	.0713	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2703	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3195	.3186	.3212	.3238	.3289	.3264	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3960	.3962	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4313	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990