

2017**MBA****3rd Semester Examination****FINANCIAL ENGINEERING****(Specialisation : Financial Management)****PAPER—F-308***Full Marks : 100**Time : 3 Hours**The figures in the right-hand margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.***1. Answer any *eight* questions : 8×5**

- (a) What is financial engineering ? Distinguish between conceptual tools and physical tools which are used in financial engineering.
- (b) Briefly explain the financial engineering process while developing new products or solutions.
- (c) Discuss any two innovations that took place in equity products.

(Turn Over)

- (d) Write short notes on :
- (i) zero coupon bond ;
 - (ii) secured premium notes.
- (e) Describe the salient features of repo transactions.
- (f) Distinguish between forward contract and future contract.
- (g) Liquidity risk arises out of maturity mismatch of assets and liabilities. Explain.
- (h) Alpha Ltd. is contemplating conversion of 8% convertible debentures of ₹ 1000 each. At present, it has 500 such debentures outstanding. The market price of the debenture is ₹ 1080. The debenture indenture provides that one debenture will be converted into 10 shares. The price earnings ratio before redemption is 20 : 1 and anticipated price earnings ratio after redemption is 25 : 1.

The number of shares outstanding prior to redemption was 10,000. Earnings before interest and taxes amounted to ₹ 2,00,000. The company is in the 50% tax bracket. Should the company convert its debentures into shares ?

- (i) (i) State the characteristics of interest-rate swap.
- (ii) A has floating rate funds on which it is paying LIBOR + 0.3 percent. But it could borrow fixed rate debt at 10.50 percent to be computed half-yearly. B has fixed-rate debt on which it is paying 9.5 percent. But it could borrow floating rate funds at 6 months LIBOR flat. Can the two parties go for interest-rate swap? If so, indicate the gain accruing to them including swap dealer.
- $2\frac{1}{2} + 2\frac{1}{2}$
- (j) (i) Explain Moody's KMV approach relating to debt management.
- (ii) Consider the following figures for a company.
- | | |
|---------------------------------|-----------------|
| Book value of all liabilities : | \$ 2.4 billion |
| Estimated default point, D : | \$ 1.9 billion |
| Market value of equity : | \$ 11.3 billion |
| Market value of firm : | \$ 13.8 billion |
| Volatility of firm value : | 20% |
- Find out the probability of default. 3+2
- (k) Make clear distinctions between spot market and forward market.

- (l) Suppose spot rate on April is 1.785/£. Pound futures contract is sold at \$ 1.790 for June delivery and at \$ 1.785 for September delivery. Expecting that pound be depreciate fast after June, a speculator buys the former and sells the latter. Later, he finds that pound may appreciate by June but may not depreciate subsequently. So he reverses the two contracts respectively at \$ 1.78 and \$ 1.76. Suppose the exchange rate on both the maturity dates is \$ 1.795/£.

Find how much the speculator gains / losses.

2. Answer any *four* questions : 4×10
- (a) Describe any five factors that contribute to the growth of Financial Engineering. 2×5
- (b) Explain the undermentioned terms in the context of foreign exchange market :
- (i) Bid-Ask Rates ; and
- (ii) Direct and Indirect Quote.
- (c) (i) State the assumption of Black-Scholes Model for option valuation.
- (ii) Calculate the value of a call option using the B-S model from the given information :
- | | |
|---|----------|
| Current market price of the shares(s) : | ₹ 75 |
| Volatility (v) : | 0.45 |
| Exercise price (E) : | ₹ 80 |
| Risk-free rate (r_f) : | 0.12 |
| Time to expiration (t) : | 6 months |

If an investor wants to buy a put with the same exercise price and expiration date as call option, what will be the value of put?

[Given—CDF for standard Normal Random Variable : $N(0.1344) = 0.5534$, $N(-0.1838) = 0.4271$] 5+5

(d) (i) What is marking to market? State the margin system followed in futures trading.

(ii) Find out the size of variation margin call of a Euro futures contract with the help of the following data :

(1) 1 Euro futures contract.

(2) Spot price is US \$ 1.50 / Euro.

(3) 0.0040 is standard deviation of daily changes in the price of futures price.

(4) Probability of exhaustion is 0.05.

(5) Number of days is 9 for which calculation is to be made : 2+3+5

(e) Explain in brief, probability of default, exposure at default and recovery rate in the context of credit risk management.

- (f) Describe delta hedge, cross hedge and delta-cross hedge in the market for currency futures.

[Internal Assessment : 20 Marks]
