

MBA 4th Semester

Solution

Financial Derivatives (KMB-FM05)

Duration: 1 hour 30 minutes

Max. Marks: 30

Note: Attempt all the Questions.

Section-A		(5*1=5)		
Q. No.	Question	Marks	CO	BL
1.	<p>a. What is interest rate swap? Ans. An interest rate swap is a contract between two parties to exchange all future interest rate payments forthcoming from a bond or loan. It's between corporations, banks, or investors. Swaps are derivative contracts. The value of the swap is derived from the underlying value of the two streams of interest payments. Swaps are like exchanging the value of the bonds without going through the legalities of buying and selling actual bonds. Most swaps are based on bonds that have adjustable-rate interest payments that change over time. Swaps allow investors to offset the risk of changes in future interest rates.</p>	1	1	1
	<p>b. What is S&P 100 stock indices? Ans. The S&P 100 Index is a stock market index of United States stocks maintained by Standard & Poor's. Index options on the S&P 100 are traded with the ticker symbol "OEX". Market cap: US\$18.1 trillion; (as of December ... Related indices: List: S&P 500 Weighting method: Free-float capitalization-we... Operator: S&P Dow Jones Indices</p>	1	1	1
	<p>c. Discuss the features of derivatives? Ans. The following features are: 1. Underlyings: The prices that relate to the asset underlying the derivative instrument. 2. Notional Amount: The number of units or quantity that are specified in the derivative instrument. 3. Minimal Initial Investment: A derivative requires little or no initial investment because it is an investment in a change in value rather than an investment in the actual asset. 4. No Required Delivery: Generally the parties to the contract, the counterparties, are not required to actually deliver an asset that is associated with the underlyings.</p>	1	1	2
	<p>d. What do you understand by underlying asset? Ans. Underlying asset are the financial assets upon which a derivative's price is based. Options are an example of a derivative. A derivative is a financial instrument with a price that is based on a different asset.</p>	1	1	1
	<p>e. What is Brettonwood System? Ans. The Brettonwood system was the first system used to control the value of money between different countries. It meant that each country had to have a monetary policy that kept the exchange rate of its currency within a fixed value—plus or minus one percent—in terms of gold. The Brettonwood system of 1944 established a new global monetary system.</p>	1	1	1

	<p>It replaced the gold standard with the U.S. dollar as the global currency. By so doing, it established America as the dominant power in the world economy. After the agreement was signed, America was the only country with the ability to print dollars.</p> <p>The agreement created the World Bank and the International Monetary Fund (IMF). These U.S.-backed organizations would monitor the new system.</p>			
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Section-B		(4*5=20)		
Q. No.	Question	Marks	CO	BL
2.	<p>a. What do you understand by derivatives? Explain the different types of derivatives?</p> <p>Ans. Literal meaning of derivative is that something which is derived. Simple one line it is that value/price which is derived from any underlying asset. The term ‘derivative’ indicates that it has no independent value, i.e., its value is entirely derived from the value of the underlying asset. The underlying asset can be securities, commodities, bullion, currency, livestock or anything else. The Securities Contracts (Regulation) Act 1956 defines ‘derivative’ as under, ‘Derivative’ includes Security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security.</p> <p>The different types of derivatives are:</p> <ol style="list-style-type: none"> 1. Forwards: A forward contract is a customized contract between two entities, where settlement takes place on a specific date in the future at today's pre-agreed price. 2. Futures: A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Futures contracts are special types of forward contracts in the sense that the later are standardized exchange-traded contracts. 3. Options: Options are of two types - calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date. It is listed on exchanges. 4. Warrants: Options generally have lives of up to one year, the majority of options traded on options exchanges having a maximum maturity of nine months. Longer-dated options (Maximum 15 years) are called warrants and are generally traded over-the-counter. It is issued by the company itself. 5. LEAPS: The acronym LEAPS means Long-Term Equity Anticipation Securities. These are options having a maturity of more than one year to three years. 6. Baskets: Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average of a basket of assets. Equity index options are a form of basket options. 7. Swaps: Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used swaps are: 	5	1	2

	<p>a. <u>Interest Rate Swaps:</u> These entail swapping only the interest related cash flows between the parties in the same currency.</p> <p>b. <u>Currency Swaps:</u> These entail swapping both principal and interest between the parties, with the cash flows in one direction being in a different currency than those in the opposite direction.</p>			
b.	<p>Discuss in detail the forward market in India?</p> <p>Ans. In India, the forward markets facilitate the hedging of transactional and contractual exposures. Transactional exposures are allowed to be hedged up to the amount of the underlying exposure after providing documentary evidence of the transaction. Contractual exposures are permitted to be hedged up to the extent of the previous year's turnover or the average of the previous three years' turnover, whichever is higher. Documents have to be provided at the time of the maturity of the contract. Since competitive exposure is based on the changes in technology, product mix, sources of inputs, marketing approach, shifting of production base etc., the measurement of competitive exposure is complex and can be inaccurate. It is for this reason that players are not allowed to hedge their competitive exposures in the forward market. The foreign exchange market in India has grown and matured significantly in the last decade. This can be attributed to the more liberalized and globalized environment within which market participants' function. As there has been increasing volatility in exchange rates and interest rates, there has been a greater need to hedge foreign exchange risk exposures. The main players in the forward markets in India are the Authorized Dealers (ADs). These ADs are allowed to deal forward in any permitted currency. The following entities can transact with the ADs in the forward market:</p> <p>a. The Reserve Bank of India can enter into swap transactions with the Ads.</p> <p>b. A resident, that is, an importer or exporter can enter into forward contracts with ADs to hedge against exchange risks.</p> <p>c. Foreign Institutional Investors (FIIs) are also eligible for forward contracts with ADs up to the full extent of their investments in debt and equity.</p> <p>d. Foreign Direct Investors (FDI) are also eligible to enter into forward contract with ADs for a period not exceeding six months.</p> <p>e. Residents with overseas direct investment in equities and loans may also hedge against foreign exchange risks arising from such investments.</p>	5	1	2
c.	<p>What do you mean by hedging? Discuss the concept of hedging with forwards?</p> <p>Ans. A hedge is an investment that protects your finances from a risky situation. Hedging is done to minimize or offset the chance that your assets will lose value. It also limits your loss to a known amount if the asset does lose value. It's similar to home insurance. You pay a fixed amount each month.</p> <p>In forwards the thing which has to hedge i.e. risk and this needs risk management. Risk management is the primary motivation for forward contracts but due to short fixation time of rate it will be converted to future contract. Companies use future contracts to hedge their risk against foreign exchange. For example, a company based in the U.S. incurs costs in dollars for labour and manufacturing. It sells to European clients who pay in euros. The company has a lead time of six months to supply the goods. In this case, the company is at risk from uncertain market fluctuation of exchange</p>	5	2	2

	rates. The company uses a future contract to sell the product six months later at today's exchange rate.			
d.	<p>Explain the relation between spot and future prices?</p> <p>Ans. A commodity's spot price is the price at which the commodity could be traded at any given time in the marketplace. In contrast, a commodities futures price is the price of the commodity in relation to its current spot price, time until delivery, risk-free interest rate and storage costs at a future date.</p>	5	1	2

Section-C		(2*5=10)		
Q. No.	Question	Marks	CO	BL
3.	<p>a. Briefly discuss the evolution of derivatives?</p> <p>Ans. It is difficult to trace out origin of futures trading since it is not clearly established as to where and when the first forward market came into existence. Historically, it is evident that futures markets were developed after the development of forward markets. It is believed that the forward trading was in existence during 12th century in England and France. Forward trading in rice was started in 17th century in Japan, known as Cho-at-Mai a kind (rice trade-on-book) concentrated around Dojima in Osaka, later on the trade in rice grew with a high degree of standardization. In 1730, this market got official recognition from the Tokugawa Shogunate (last Feudal Japanese military Government). As such, the Dojima rice market became the first futures market in the sense that it was registered on organized exchange with the standardized trading norms. The butter and eggs dealers of Chicago Produce Exchange joined hands in 1898 to form the Chicago Mercantile Exchange for futures trading. The exchange provided a futures market for many commodities including pork bellies (1961), live cattle (1964), live hogs (1966), and feeder cattle (1971). The International Monetary Market was formed as a division of the Chicago Mercantile Exchange in 1972 for futures trading in foreign currencies. In 1982, it introduced a futures contract on the S&P 500 Stock Index. Among these are the Chicago Rice and Cotton Exchange, the New York Futures Exchange, the London International Financial Futures Exchange, the Toronto Futures Exchange and the Singapore International Monetary Exchange takes place. During 1980's, markets developed for options in foreign exchange, options on stock indices, and options on futures contracts. The Philadelphia Stock Exchange is the premier exchange for trading foreign exchange options. The Chicago Board Options Exchange trades options on the S&P 100 and the S&P 500 stock indices while the American Stock Exchange trades options on the Major Market Stock Index, and the New York Stock Exchange trades options on the NYSE Index. Most exchanges offering futures contracts now also offer options on these futures contracts. Thus, the Chicago Board of Trades offers options on commodity futures, the Chicago Mercantile Exchange offers options on live cattle futures, and the International Monetary Market offers options on foreign currency futures, and so on. The basic cause of future trading was to cover the price risk. In earlier years, transporting goods from one market to other markets took many months. For example, in the 1800s, food grains produced in England sent through ships to the United States which normally took few months. Sometimes, during this time, the price</p>	5	1	2

changed due to unfavourable events before the goods reached to the destination. In such cases, the producers had to sell their goods at loss. Therefore, the producers sought to avoid such price risk by selling their goods future, or on a “to arrive” basis. The basic idea behind this move at that time was simply to cover future price risk. On the opposite side, the speculator or other commercial firms seeking to manage their price risk came forward to go for such trading. In this way, the future trading in commodities came into existence. In the beginning, these future trading agreements were formed to buy and sell food grains in the future for actual delivery at the pre-determined price. Later on these agreements became transferable, and during the American Civil War period, i.e., 1860 to 1865, it became common place to sell and resell such agreements where actual delivery of produce was not necessary. Gradually, the traders realized that the agreements were easier to buy and sell if the same were standardized in terms of quantity, quality and place of delivery relating to food grains. In the nineteenth century this activity was centered in Chicago which was the main food grains marketing center in the United States. In this way, the modern futures contracts first came into existence with the establishment of the Chicago Board of Trade (CBOT) in the year 1848, and today, it is the largest futures market of the world. In 1865, the CBOT framed the general rules for such trading which later on became a trendsetter for so many other markets. In 1874, the Chicago Produce Exchange was established which provided the market for butter, eggs, poultry, and other perishable agricultural products. In the year 1877, the London Metal Exchange came into existence, and today, it is the leading market in metal trading both in spot as well as forward. In the year 1898, the butter and egg dealers withdraw from the Chicago Produce Exchange to form separately the Chicago Butter and Egg Board, and thus, in 1919 this exchange was renamed as the Chicago Mercantile Exchange (CME) and was reorganized for futures trading. Although financial derivatives have been in operation since long, but they have become a major force in financial markets in the early 1970s. The basic reason behind this development was the failure of Brettonwood System and the fixed exchange rate regime was broken down. As a result, new exchange rate regime, i.e., floating rate (flexible) system based upon market forces came into existence. But due to pressure or demand and supply on different currencies, the exchange rates were constantly changing, and often, substantially. As a result, the business firms faced a new risk, known as currency or foreign exchange risk. Another important reason for the instability in the financial market was fluctuation in the short-term interests. This was mainly due to that most of the Government at that time tried to manage foreign exchange fluctuations through short-term interest rates and by maintaining money supply targets, but which were contrary to each other. Further, the increased instability of short-term interest rates created adverse impact on long-term interest rates, and hence, instability in bond prices, because they are largely determined by long-term interest rates. The result is that it created another risk, named interest rate risk, for both the issuers and the investors of debt instruments. Interest rate fluctuations had not only created instability in bond prices, but also in other long-term assets such as, company stocks and shares. Share prices are determined on the basis of expected present values of future dividend payments discounted at the appropriate discount rate. Discount

	<p>rates are usually based on long-term interest rates in the market. So increased instability in the long-term interest rates caused enhanced fluctuations in the share prices in the stock markets. Further volatility in stock prices is reflected in the volatility in stock market indices which causes systematic risk or market risk. In the early 1970s, it is witnessed that the financial markets were highly instable; as a result, so many financial derivatives have been emerged as the means to manage the different types of risks stated above, and also for taking advantage of it. Hence, the first financial futures market was the International Monetary Market, established in 1972 by the Chicago Mercantile Exchange which was followed by the London International Financial Futures Exchange in 1982. The Forwards Contracts (Regulation) Act, 1952, regulates the forward/futures contracts in commodities all over India. As per this the Forward Markets Commission (FMC) continues to have jurisdiction over commodity forward/futures contracts. However when derivatives trading in securities was introduced in 2001, the term ‘security’ in the Securities Contracts (Regulation) Act, 1956 (SCRA), was amended to include derivative contracts in securities. Consequently, regulation of derivatives came under the preview of Securities & Exchange Board of India (SEBI) which previously called as Stock Exchange Board of India.</p>			
b.	<p>Differentiate between future market and option market? Ans. Future and Option market help to derive their values from the value of underlying assets. They are usually used to hedge, to speculate or to gain arbitrage.</p> <p>Futures refer to standardized, exchange traded contracts, the buyers/ sellers of which promise to buy/sell a particular underlying at future date at a pre-determined price. It is a forward commitment. Since these are exchange traded, the clearing house acts as a party to the contract. These are typically highly regulated and are subject to daily settlement also called as marked-to-market. The trader/investor can involve in futures trading by setting up a margin account by paying up the initial margin. The balance of the account, after being marked to market, will decide if the trader has to pay a maintenance margin.</p> <p>Options, on the other hand, are contingent claims, they are exercised in case of the underlying attaining a favorable price. Options refer to a right but not an obligation of the buyer of the option to either buy or sell an underlying at a future date at a pre-determined price. It is, however, an obligation of the seller. The buyer pays a premium to the seller to buy the right. Options can be OTC or exchange traded. The option to buy is call option and the option to sell is a put option. Options that can be exercised before expiry are American options, whereas those that cannot be exercised before expiry are European options. An option is at-the-money when there is no profit no loss, in-the-money when profitable and out-of-the money when at loss.</p>	5	1	2

Section-C		(2*5=10)		
Q. No.	Question	Marks	CO	BL
4.	<p>a. “Option is a right but not obligation for the buyer of options.” Do you agree? Ans. In finance, an option is a contract which gives the buyer (the owner or holder of the option) the right, but not the obligation, to buy or sell an</p>	5	2	5

	<p>underlying asset or instrument at a specified strike price prior to or on a specified date, depending on the form of the option. Options are financial instruments that are derivatives based on the value of underlying securities such as stocks. An options contract offers the buyer the opportunity to buy or sell—depending on the type of contract they hold—the underlying asset. Unlike futures, the holder is not required to buy or sell the asset if they choose not to.</p> <ul style="list-style-type: none"> ▪ Call options allow the holder to buy the asset at a stated price within a specific time frame. ▪ Put options allow the holder to sell the asset at a stated price within a specific timeframe. <p>Each option contract will have a specific expiration date by which the holder must exercise their option. The stated price on an option is known as the strike price. Options are typically bought and sold through online or retail brokers.</p> <p>Options are a versatile financial product. These contracts involve a buyer and a seller, where the buyer pays an options premium for the rights granted by the contract. Each call option has a bullish buyer and a bearish seller, while put options have a bearish buyer and a bullish seller.</p> <p>Options contracts usually represent 100 shares of the underlying security, and the buyer will pay a premium fee for each contract. For example, if an option has a premium of 35 cents per contract, buying one option would cost \$35 ($\\$0.35 \times 100 = \\$35$). The premium is partially based on the strike price—the price for buying or selling the security until the expiration date. Another factor in the premium price is the expiration date. Just like with that carton of milk in the refrigerator, the expiration date indicates the day the option contract must be used. The underlying asset will determine the use-by date. For stocks, it is usually the third Friday of the contract's month.</p> <p>Traders and investors will buy and sell options for several reasons. Options speculation allows a trader to hold a leveraged position in an asset at a lower cost than buying shares of the asset. Investors will use options to hedge or reduce the risk exposure of their portfolio. In some cases, the option holder can generate income when they buy call options or become an options writer. American options can be exercised any time before the expiration date of the option, while European options can only be exercised on the expiration date or the exercise date. Exercising means utilizing the right to buy or sell the underlying security.</p>			
b.	<p>Discuss in detail the evolution of derivatives market in India?</p> <p>Ans. The first step towards introduction of derivatives trading in India was the announcement of the Securities Laws (Amendment) Ordinance, 1995, which withdrew the prohibition on options in securities. The market for derivatives, however, did not take off, as there was no regulatory framework to govern trading of derivatives. SEBI set up a 24 members committee under the Chairmanship of Dr. L. C. Gupta on November 18th, 1996 to develop appropriate regulatory framework for derivatives trading in India. The committee submitted its report on March 17th, 1998 prescribing necessary pre-conditions for introduction of derivatives trading in India. The committee recommended that derivatives should be declared as 'securities' so that regulatory framework applicable to trading of 'securities' could also govern trading of securities. SEBI also set up a group in June 1998 under the</p>	5	1	2

	<p>Chairmanship of Prof. J. R. Varma, to recommend measures for risk containment in derivatives market in India. The report, which was submitted in October 1998, worked out the operational details of margining system, methodology for charging initial margins, broker net worth and real-time monitoring requirements. The Securities Contracts (Regulation) Act, 1956 was amended in December 1999 to include derivatives within the range of 'securities' and the regulatory framework was developed for governing derivatives trading. The Act also made it clear that derivatives shall be legal and valid only if such contracts are traded on a recognized stock exchange, thus restrict OTC derivatives. The Government also cancelled in March 2000, the three decade old notification, which prohibited forward trading in securities. Derivatives trading commenced in India in June 2000 after SEBI granted the final approval to this effect in May 2000. SEBI permitted the derivative segments of two stock exchanges, NSE and BSE, and their clearing house/corporation to commence trading and settlement in approved derivatives contracts. To begin with, SEBI approved trading in index futures contracts based on S&P CNX Nifty and BSE-30 (Sensex) index. CNX stands for Credit Rating Information Services of India Limited (CRISIL) and the National Stock Exchange of India (NSE). This was followed by approval for trading in options based on these two indexes and options on individual securities. The trading in index options commenced in June 2001 and the trading in options on individual securities commenced in July 2001.</p>			
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Section-C		(2*5=10)		
Q. No.	Question	Marks	CO	BL
5.	<p>a. “Only risk seeking organisations should use derivatives.” Justify the statement?</p> <p>Ans. Derivatives are financial instruments that have values derived from other assets like stocks, bonds, or foreign exchange. Derivatives are sometimes used to hedge a position (protecting against the risk of an adverse move in an asset) or to speculate on future moves in the underlying instrument. Hedging is a form of risk management that is common in the stock market, where investors use derivatives called put options to protect shares or even entire portfolios.</p> <p>A derivative is a financial instrument with a price that depends on (or is derived from) another asset. It is typically a contractual agreement between two parties in which one party is obligated to buy or sell the underlying security and the other has the right to buy or sell the underlying security. However, derivatives can take many forms and some—like OTC derivatives—are complex and mostly traded by professional rather than individual investors. On the other hand, many derivatives are listed on derivatives exchanges and are standardized in terms of the quantities traded (size), expiration dates, and exercise (strike) prices.</p> <p>Equity options are examples of derivative contracts. A call option gives the owner the right (not the obligation) to buy 100 shares of stock per contract. A put option, on the other hand, is a contract that gives the holder the right to sell 100 shares of stock. Put options are often used to protect stock holdings or portfolios.</p>	5	1	5

	<p>Hedging is the act of taking a position in a related and uncorrelated security, which helps to mitigate against opposite price movements. For example, assume an investor bought 1,000 shares of Tesla Motors (TSLA) for \$65 a share. The investment is held for over two years and now the investor is worried that Tesla will miss earnings per share (EPS) and revenue expectations—sending shares lower and giving back some of the profits accumulated over those two years.</p> <p>Tesla's stock price is now \$244—representing a value of \$244,000 and an unrealized profit of \$179,000 on 1,000 shares—and the investor wants to initiate a protective strategy. To hedge the position against the risk of any adverse price fluctuations, the investor buys 10 put option contracts on Tesla with a strike price of \$230 and a September expiration date.</p> <p>The put option contract gives the investor the right to sell his shares of Tesla for \$230 a share through September. Since one stock option contract leverages 100 shares of the underlying stock, the investor could sell 1,000 (100 x 10) shares with 10 put options. This strategy—of buying shares and buying puts—is called the protective put.</p>			
b.	<p>What is forward contract? How the forward contract is differ from future contract?</p> <p>Ans. A forward contract is a contract between two parties to exchange a pre-determined amount of a currency at a specified exchange rate (called the forward rate) on a specified date in the future. The most common forward contracts are for 2, 7, 15, 30, 60, 90, 180, and 360 days, although longer or shorter periods are available but now it is restricted maximum upto 2 days against the fixation of forward rate. When multinational corporations (MNCs) anticipate a future need for or future receipt of a foreign currency, they can set up forward contracts to lock in the rate at which they can purchase or sell a particular foreign currency. Many large MNCs use forward contracts in order to hedge their fix exposure.</p> <p>Forward and futures contracts are similar in many ways: both involve the agreement to buy and sell assets at a future date and both have prices that are derived from some underlying asset. A forward contract, though, is an arrangement made over-the-counter (OTC) between two counterparties that negotiate and arrives on the exact terms of the contract - such as its expiration date, how many units of the underlying asset are represented in the contract, and what exactly the underlying asset to be delivered is, among other factors. Forwards settle just once at the end of the contract. Futures, on the other hand, are standardized contracts with fixed maturity dates and uniform underlyings. These are traded on exchanges and settled on a daily basis.</p>	5	1	2