DKK-003-016405

DKK-003-016405 Seat No. ________

M. Sc. (Sem. IV) (CBCS) Examination

May/June – 2015

EMT-4011 : Financial Mathematics

Faculty Code : 003

Subject Code : 016405

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions :

(1) Attempt all the questions.

(2) Each question carries equal marks.

1 Choose the most appropriate alternative / alternatives : (any seven)

(1) In European call option a holder can purchase a prescribed asset

(A) only at the time of expiry

(B) any time before time of expiry

(C) after three months of expiry

(D) after six months of expiry

(2) 'NIFTY' is one of the index from

(A) Sri Lanka (B) Nepal

(C) India (D) Japan

(3) In Asian option the price depends upon

(A) past history

(B) financial condition of the company

(C) political situation

(D) some form of average

(4) The volatility is defined by

(A) θ (B) σ

(C) δ (D) none of these

(5) The randomness can be eliminates by

(A) $\sigma = 0$ (B) $r = 0$

(C) $\Delta = \frac{\partial f}{\partial s}$ (D) none of these

(6) Which of the following is/are not financial market

(A) Grocery market (B) Jewellery market

(C) Currency market (D) Bond market

(7) Hedging is an action to prevent

(A) loss

(B) profit

(C) financial irregularities

(D) waste of food

(8) The Black-Scholes differential equation is

(A) forward parabolic

(B) backward parabolic

(C) of order 2

(D) of order 3

(9) According to simple model of asset price

   (A) holder's edge is important

   (B) past history is fully reflected

   (C) the financial condition is fully reflected

   (D) date of expiry is fully reflected

(10) The value of portfolio is defined as

   (A) S+P+C   (B) S+P–C

   (C) S–P–C   (D) S+P

2 Attempt any two :

(a) Explain : What are options for ?

(b) Explain : Higher the exercise price more is received for the asset at the time of expiry of put option.

(c) What is an American option ? Why it is worth in comparison to an European option.

3 (a) Define the following terms :

   (1) Asian option

   (2) Look-back option

   (3) Volatility

   (4) Holder of option

   (5) Hedging

   (6) Asset price

   (7) Excercise price.

(b) State and prove Ito's lemma.

4 Attempt any two :

(a) State the assumptions of Black-Scholes analysis and derive the Black-Scholes partial differential equations.

(b) Derive the stochastic differential equation and also give the economically reasonable justification of the derived equation.

(c) Explain the terms 'bid-ask' and 'bid-offer'.

5 Attempt any two :

(a) Explain : Forward and future contracts.

(b) Find the stochastic differential equation for $f(s) = s^n$.

(c) Explain in detail the elimination of randomness.

(d) Explain discrete dividend pay structure and derive the jump conditions for the same.