Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Energy Derivatives and Risk Management II **Semester: III**
Programme: MBA (Energy Trading) **Course Code:OGET8003**
Time: 03 hrs. **Max. Marks: 100**
Instructions:

SECTION A

S. No.		Marks	CO
Q 1	**Explain the following in not more than 2 lines** 1.) Leverage effect 2.) Kappa being .3 3.) Vanilla swap 4.) Rho at .12 5.) At the money option 6.) Arbitrage 7.) Monte Carlo simulation 8.) Stress Testing 9.) Unit root test of GARCH model 10.) Hedge ratio	**20**	**1,2**

SECTION B

Q 1.	Applying binomial model, what will be the value of call option that pays Max(S_1 – 107,0) after 1 year with u= 1.07, S_0 = 100. Explain in detail?	**5**	**CO 1,3**
Q 2.	Value at risk (VAR) is a probabilistic measure of the range of values a firm's portfolio could lose due to market volatility. Explain the various methods of calculating VAR for a simple portfolio?	**5**	**CO 2**
Q 3.	Enumerate the ways in which Delta is defined?	**5**	**CO 5**
Q 4.	Explain the difference between the following: a.) Currency and Interest rate swap b.) Implied and Historical volatility	**5**	**CO 4,5**

SECTION-C

Q 1.	Calculate the value of a European call option by illustrating stock and options lattice for a period of 4 years with the following details.	**20**	**CO 3**

	<table><tr><th colspan="2">Lattice Parameters</th></tr><tr><td>Initial Price</td><td>100</td></tr><tr><td>Strike Price</td><td>110</td></tr><tr><td>R</td><td>1.05</td></tr><tr><td>U</td><td>1.08</td></tr><tr><td>D</td><td>0.93</td></tr><tr><td>Q</td><td>80.53 %</td></tr><tr><td>1-q</td><td>19.47 %</td></tr></table>		
Q 2.	The GARCH **model** is appropriate when the error variance in a time series follows an autoregressive (AR) **model** and is vital to calculate volatility of prices. Explain the steps with equations.	**10**	**CO 5**
	SECTION-D		
Q1.	**Refer the document "Ludwig Chincarini. A Case Study on Risk Management: Lessons from the Collapse of Amaranth Advisors, L.L.C." and answer the following questions.** 1.) Identify the factors that led to the collapse of Amaranth Advisors LLC. 2.) Understand the rationale and structuring of the long winter, short non-winter trading strategy used by Amaranth. 3.) Explain how Amaranth was able to maintain net position sizes above NYMEX position limit guidelines and summarize the implications of this action. 4.) Understand the relative impact of market, liquidity, and funding risk on Amaranth's Portfolio.	**30**	**CO 2,3,5**

Student's should carry the case study of ""Ludwig Chincarini. A Case Study on Risk Management: Lessons from the Collapse of Amaranth Advisors, L.L.C."