Tribhuvan University

2081

Bachelor Level (4 Yrs.) /Science & Tech. / IV Year

Econophysics -Interdisciplinary

PHY - 407

Full Marks: 50

Time: 1½ hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt ALL questions.

1. Why is economics important for physicists? Relate market phenomenon with natural process providing some suitable examples. [10]

   OR

   What is Gaussian distribution? Show that the Gaussian distribution is stable distribution.

2. Discuss the terms correlation and auto-correlation functions. Also discuss the use of auto-correlation function to interpret the market data. [10]

3. Give a brief account of time and price scales in financial markets. [6]

   OR

   What is chaos? Discuss chaos approach in market.

4. Answer any two [2×3=6]

   a) What is basin of attraction?

   b) Describe the efficient market hypothesis with suitable examples.

   c) What do you mean by power spectrum?

5. Explain algorithmic complexity theory. Also describe how this theory helps to understand the behaviour of financial time series. [6]

6. One Kg of apple in Mustang cost Rs. 50.00 and at the same time it costs Rs. 150.00 in Kathmandu. If the cost of storage and

transportation of 1 Kg apple is Rs. 25.00, find the arbitrage when 5 metric tons of apple bought in Mustang and sold in Kathmandu.
(Given : 1 metric ton = 1000 Kg] [6]

7. Suppose that IQ scores have a bell shaped distribution with a mean of 100 and a standard deviation of 15. What percentage of people would have an IQ scores of more than 130?
(Given: Area of curve for Z = 2 ; 0.4772) [6]