Seat No. : _____

NI-101

November-2013

B.Sc. Sem.-III

202 : Statistics

(Mathematical Economics & Actuarial Science-I)

Time : 3 Hours] **[Max. Marks : 70**

Instructions : (1) Attempt **all** questions.
(2) Each questions carry equal marks.

1. (a) Discuss the problem of construction of wholesale price index number with special reference to **7**
(i) selection of commodities
(ii) selection of base period
(iii) data for index number
(iv) selection of type of averages

OR

Calculate index number of prices for 1995 on the basis of 1990 from the data given below by using the price relatives method.

Commodities	Weight	Price/unit in 1990	Price/unit in 1995
A	40	16	20
B	25	40	50
C	20	12	15
D	15	2	3

If the weights of commodities A, B, C, D are increased in the ratio 1 : 2 : 3 : 4, what will be increase in index number ?

(b) What are the different types of errors occurred in the construction of index number ? Explain them in detail. **7**

OR

Define cost of living index number. Describe various steps involved in the construction of cost of living index number.

2. (a) Define different indices of mortality and given the formulae used for them. Which index would you recommend for (i) Comparing mortality of the population of country at different points of time and (ii) comparing mortality of different segments of the population of a country at a given point of time ? Give reasons for your answer. **7**

OR

What are the various coefficients used for measuring fertility ? Discuss their merits and demerits. Explain the factors which affect fertility.

(b) What are vital events ? Describe various methods of collecting vital statistics data. **7**

OR

Explain different measures of population growth.

3. (a) Define income distribution function. Explain Pareto law of income distribution. State its characteristics. **7**

OR

Explain Lorentz curve of income distribution. State its properties.

(b) Discuss Log-normal distribution. State its characteristics. **7**

OR

What is meant by income inequality ? Discuss Gini's coefficient for measuring inequality. State the advantages and disadvantages of this measurement.

4. (a) What is life table ? State basic assumptions in the construction of life table. **7**

OR

Explain insurance and utility theory.

(b) The probability that a property will not be damaged in the next period is 0.75. The p.d.f. of a positive loss is given by **7**

$f(x) = 0.25\ (0.01\ e^{-0.01x})$, $x > 0$

The owner of the property has a utility function given by $u(w) = -e^{-0.005w}$

Calculate the expected loss and the maximum insurance premium the property owner will pay for complete insurance.

OR

Explain the uses of life table in detail.

5. Answer the following objectives : **14**

(1) State the condition for TRT.
(2) What is equidistribution line ?
(3) State any two uses of index number.
(4) State any two limitations of index number.
(5) What is the index for base year ?
(6) Define Pearl's Vital Index.
(7) Define Stationery Population.
(8) What is Curate Expectation of Life ?
(9) Give interpretation of GRR = 2.1
(10) Define force of mortality μ_x.
(11) State the formulae of Laspeyre's and Marshall-Edgeworth's index numbers.
(12) State any two properties of Pareto-Levy Law.
(13) Define Central Mortality.
(14) Define Utility Wealth Function.