FIRST SEMESTER M.Com. DEGREE EXAMINATION, DECEMBER 2014

(CUCSS)

MC 1C 2—QUANTITATIVE TECHNIQUES

Time : Three Hours   Maximum : 36 Weightage

Part A

Answer all questions.
Each question carries 1 weightage.

1. What is conditional probability ?

2. What is an interval estimate ?

3. What is meant by a fair game ?

4. What is ANOVA ?

5. What is meant by level of significance ?

6. What is a random variable ?

(6 x 1 = 6 weightage)

Part B

Answer any six questions.
Each question carries 3 weightage.

7. Describe the requirements for using the Poisson distribution to approximate the binomial probabilities.

8. State the central limit theorem and highlight its importance in Statistical inference.

9. Explain the concept of EVPI. Will it always be equal to EOL ? Why *or* why not ?

10. Police records show that there has been an average of four accidents per week on a busy stretch of a highway. Assuming these accidents follow a Poisson process, what is the probability that the police must respond to exactly six accidents in a given week ?

11. The lifetimes of batteries produced by a firm are normally distributed with a mean of 110 hours and a standard deviation of 10 hours. What is the probability that a battery will last between 112 and 123 hours ?

12. Four cards are drawn from a full pack of well shuffled cards. Find the probability that two are spades and two are hearts.

13. An insurance company insured 1,500 auto drivers, 3500 car drivers and 5,000 truck drivers. The probability of an accident is 0.05, 0.02 and 0.10 respectively in the case of auto, car and truck driver categories. One of the insured persons meets with an accident. What is the probability that he or she is a car driver ?

Turn over

14. In a random sample of 500 people eating lunch at a hospital cafeteria on various Fridays, it was found that 160 preferred seafood. Find a 95% confidence interval for the actual proportion of people who eat seafood on Fridays at this cafeteria.

(6 x 3 = 18 weightage)

Part C

Answer any **two** *of the following*
Each question carries 6 *weightage.*

15. What is Statistical Quality Control ? What are its uses and limitations ? Describe the control charts used for variables.

16. In a referendum submitted to the student body at a University, 850 men and 566 women voted. Five hundred and thirty of the men and 304 of the women voted 'Yes'. Does this result indicate a significant difference of opinion on the matter between men and women students ? Test at the 1% level of significance.

17. A company has the opportunity to computerize its records departments. However, existing personnel have job security under a union agreement. The cost of the three alternative programmes for the changeover depends upon the attitude of the trade unions and are estimated below :

Attitude of Union	General retraining	Selective retraining	Select new employees
Antagonist	940	920	900
Passive	810	800	820
Enthusiastic	700	710	860

   (i)   What is the minimax strategy ?

  (ii)   Construct the opportunity loss table.

 (iii)   The probabilities of the different states are expressed as 0.50, 0.30 and 0.20 respectively. Find the expected cost of each act.

 (iv)   Given the above probabilities, what is the expected value of perfect information ?

(2 x 6 = 12 weightage)