TDC (CBCS) Odd Semester Exam., 2020
held in March, 2021

ECONOMICS

(3rd Semester)

Course No. : ECOHCC–303T

(Statistical Methods for Economics)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

SECTION—A

1. Answer any *ten* of the following questions : 2×10=20

(a) What is median?

(b) Mention two disadvantages of mode.

(c) What is meant by measures of location?

(d) Write two measures of skewness.

(e) Define sample space with an example.

(f) Mention two axioms of probability.

(g) What are exhaustive events and independent events?

(h) Define conditional probability with an example.

(i) What are the probability mass function and probability density function?

(j) Which two conditions a probability mass function must satisfy?

(k) Write two names of discrete probability distribution.

(l) What are the mean and variance of a normal distribution?

(m) Point out two distinctions between census method and sample survey method.

(n) Distinguish between standard error and standard deviation.

(o) Write two properties of a random sample.

(p) Write one merit and one demerit of multistage sampling.

(q) What is confidence interval?

(r) Define a statistical hypothesis.

(s) Distinguish between parameter and statistic.

(t) What is a consistent estimator? Give one example.

SECTION—B

Answer *any* **five** questions

2. (a) Prove that standard deviation is independent of the effect of change of origin but not of scale. 5

(b) Calculate quartile deviation from the data given below : 5

Class	:	(0–15)	(15–30)	(30–45)	(45–60)
Frequency	:	8	26	30	45

Class	:	(60–75)	(75–90)	(90–105)
Frequency	:	20	17	4

3. (a) Write a short note on Kurtosis. 4

(b) Find out the coefficient of skewness from the following : 6

Class	:	(59–61)	(61–63)	(63–65)	(65–67)	(67–69)
Frequency	:	4	30	45	15	6

4. *(a)* If A and B are two independent events then show that

$$P(A+B) = P(A) + P(B) - P(AB)$$ 5

(b) The probability that a man will be alive 25 years is 3/5 and the probability that his wife will be alive 25 years is 2/3. Find the probability that both will alive and at least one will be alive. 5

5. *(a)* Explain the Bayes' theorem of probability. 5

(b) In a computer factory, three plants namely A, B and C produce 50%, 30% and 20% respectively of the total production. Of their output 5%, 3% and 2% are defective computers. A computer is drawn at random and is found to be defective. Find the probabilities that plant A or B or C has produced it. 5

6. *(a)* What is binomial distribution? Mention the important properties of binomial distribution. 2+4=6

(Continued)

(b) X is a discrete random variate having probability mass function :

x	:	0	1	2	3	4	5	6	7
$P(X = x)$	:	0	K	$2K$	$2K$	$3K$	K^2	$2K^2$	$7K^2 + K$

Find the value of K. 4

7. (a) What do you understand by expectation of a random variable? State how you will find the mean and SD of a discrete probability distribution with p.m.f. $f(x)$. 2+4=6

(b) A random variable has the following probability distribution :

x	:	4	5	6	8
Probability	:	0·1	0·3	0·4	0·2

Find out the expectation and SD of the random variable. 4

8. (a) Distinguish between probability and non-probability sampling method. 4

(b) Explain the different methods of obtaining a probability sample. 6

9. (a) Write down the properties of correlation coefficients. 4

(b) Describe the essential characteristics of a good sample. 6

10. (a) Describe the method of maximum likelihood for the estimation of unknown parameters. 6

(b) State the important properties of maximum likelihood estimators. 4

11. (a) Write a short note on method of moments. 4

(b) In a random sample of size 100 taken from a population of size 1000, the mean and SD of a sample characteristic are found to be 4·8 and 1·1 respectively. Find the 95% confidence interval for population mean. 6

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