

**2020/TDC (CBCS)/ODD/SEM/
ECOHCC-303T/456**

**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

Answer any *ten* of the following questions :

$2 \times 10 = 20$

- (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

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

- (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. (a) Explain the Bayes' theorem of probability.

- (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.

6. (a) What is binomial distribution? Mention the important properties of binomial distribution.

$$2+4=6$$

- (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	$2K^2$	$7K^2 + K$

4

Find the value of K .

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.
- (b) State the important properties of maximum likelihood estimators.
11. (a) Write a short note on method of moments.
- (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.
