

**2023/TDC(CBCS)/ODD/SEM/  
ECOHCC-303T/345**

**TDC (CBCS) Odd Semester Exam., 2023**

**ECONOMICS**

**( Honours )**

**( 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 *ten* questions, selecting any *two* from each

Unit : 2×10=20

**UNIT—I**

1. Define median.
2. State the empirical relationship between mean, median and mode.
3. What is coefficient of variation?

( 2 )

## UNIT—II

4. Define sample space with example.
5. State classical definition of probability.
6. Events  $A$  and  $B$  are mutually exclusive for which  $P(A) = 0.3$ ,  $P(A + B) = 0.5$ . Find  $P(B)$ .

## UNIT—III

7. What is mathematical expectation?
8. Mention two properties of uniform distribution.
9. Define continuous random variable.

## UNIT—IV

10. Define random variable.
11. What is distribution function?
12. Mention two limitations of census survey.

## UNIT—V

13. Mention two differences between population and sample.
14. Define sampling distribution.
15. Write two uses of standard error.

( 3 )

## SECTION—B

Answer *five* questions, selecting *one* from each  
Unit :  $10 \times 5 = 50$

## UNIT—I

16. (a) Calculate mode from the following data :

Variable (x)	:	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	:	10	15	30	12	8	6

- (b) Also draw the histogram and locate mode for the above data.
  - (c) Show that  $AM \geq HM \geq GM$ .  $4+3+3=10$
17. (a) Coefficients of variation of two series are 60% and 80%. Their standard deviation are 20 and 16. What are their arithmetic mean?
- (b) Show that standard deviation is independent of the change of origin but not of scale.
  - (c) Write a note on skewness.  $3+4+3=10$

## UNIT—II

18. (a) Define with example :  
Mutually exclusive events; Exhaustive events and equally likely events.

( 4 )

- (b) A drawer contains 50 bolts and 150 nuts. Half of the bolts and half of the nuts are rusted. If one item is chosen at random, what is the probability that it is rusted or is a bolt?  $6+4=10$

19. (a) What are the axioms of probability?

- (b) From a pack of 52 cards, 2 cards are drawn one after the another with replacement. What is the probability that both cards are king?

- (c) State and prove the theorem of compound probability.  $3+2+5=10$

## UNIT—III

20. (a) A coin is tossed three times. Find expected value of  $X$ , if  $X$  denotes number of times head appears.

- (b) Distinguish between probability mass function and probability density function.

- (c) A discrete random variable  $x$  has following probability distribution function :

$x$	0	1	2	3	4	5	6	7
$P_i$	0	$k$	$2k$	$2k$	$3k$	$k^2$	$2k^2$	$7k^2 + k$

Find the value of  $k$  and distribution function of  $x$ .  $3+3+4=10$

( 5 )

21. (a) What is Poisson distribution? What are the properties of Poisson distribution.

 $2+3=5$ 

- (b) Mention the properties of normal distribution.

5

## UNIT—IV

22. (a) State and illustrate joint distribution.

5

- (b) An unbiased coin is thrown three times. If the random variable  $X$  denotes the number of heads obtained, find the cumulative distribution function (c.d.f.) of  $X$ .

5

23. What is probability sampling? Explain the different types of probability sampling.  $2+8=10$

## UNIT—V

24. (a) Distinguish between point estimation and interval estimation.

3

- (b) A random sample of 400 items is found to have a mean of 82 and standard deviation of 18. Find 95% and 99% confidence limits for the population mean from which the sample is drawn.

4

- (c) Illustrate consistency and efficiency criteria of a good estimator.

3

- 25. (a)** Distinguish between parameter and statistics. 3
- (b)** Explain the concept of sampling distribution of a statistics. 4
- (c)** A simple random sample of size 5 is drawn without replacement from a finite population consisting of 41 units. If the population standard deviation is 6.25, what is the standard error of sample mean? 3

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