

FOURTH SEMESTER BA DEGREE EXAMINATION, APRIL 2025**(Regular/Improvement/Supplementary)****ECONOMICS****GECO4B05T: QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS II****Time: 2 ½ Hours****Maximum Marks: 80****SECTION A: Answer the following questions. Each carries two marks.****(Ceiling 25 marks)**

1. Define conditional probability.
2. What are the applications of Z test?
3. State the conditions for Poisson distribution being the approximation or limiting form of Binomial distribution.
4. Eight unbiased coins were tossed simultaneously. Using the binomial probability function, find the probabilities of getting (i) no heads at all. (ii) At most two heads.
5. Write down the pdf of t distribution.
6. What is sampling distribution?
7. What are the applications of Chi - square distribution?
8. The distribution of marks obtained by a group of students is normal with mean 50 marks and standard deviation 15 marks. Estimate the percentage of students with marks below 35.
9. State addition theorem on probability for three events.
10. Of 150 patients examined at a clinic, it was found that 90 had heart troubles, 50 had diabetes and 30 had both diseases. What percentage of patients had either heart trouble or diabetes?
11. State central limit theorem.
12. Define interval estimation.
13. Give the confidence interval for the mean of a Normal population when population standard deviation is unknown and sample size is large.
14. Define null and alternative hypothesis.
15. What is statistical inference?

(PTO)

**SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 35 marks)**

16. Given $P(A) = 3/14$, $P(B) = 1/6$, $P(C) = 1/3$, $P(A \text{ and } C) = 1/7$ and $P(B|C) = 5/21$. Find the following probabilities.
- (a) $P(A|C)$
 - (b) $P(C|A)$
 - (c) $P(B \text{ and } C)$
 - (d) $P(C|B)$
17. A sample of 400 items is taken from a population whose standard deviation is 1.5. The mean of the sample is 25. Test whether the sample has come from a population with mean 26.
18. Between the hours 10 a.m and 11 a.m, the average number of customers coming to a retail shop is 2.5. Find the probability that during one particular hour there will be :
- (i) Exactly 3 customers coming.
 - (ii) No customers coming.
 - (iii) At least 3 customers coming to the shop.
19. The weekly wages of 1000 workers are normally distributed around a mean of Rs.70 and with a standard deviation of Rs. 5. Estimate the lowest wages of the 100 highest paid workers.
20. An urn A contains 2 white and 4 black balls. Another urn B contains 5 white and 7 black balls. A ball is transferred from the urn A to urn B. Then a ball is drawn from urn B. Find the probability that it will be white.
21. If the mean age at death of 64 men engaged in an occupation is 52.4 years with standard deviation of 10.2 years. What are the 98% confidence limits for the mean of all men in that occupation?
22. Distinguish between point estimation and interval estimation.
23. A random sample of 27 pairs of observations from a normal population gives a correlation coefficient of 0.42. Is it likely that the variables in the population are uncorrelated?

SECTION C: Answer any two questions. Each carries *ten* marks.

24. (i) Define independent events.

(ii) The probability that Mr. X will solve a problem in accountancy is $\frac{2}{5}$ and the probability that Mr. Y will solve that problem is $\frac{3}{8}$. If they try independently, then what is the probability that

(i) Both will solve the problem.

(ii) At least one will solve the problem.

(iii) None will solve the problem.

25. The p.m.f of a random variable X is given as follows:

x	0	1	2	3	4	5
P(x)	K^2	$k/4$	$5k/4$	$k/4$	$2k^2$	K^2

Find (i) k.

(ii) $P(0 < X < 3)$

(iii) $P(X > 3)$

26. (i) Give the confidence interval for the proportion of success of a binomial population.

(ii) The mean and standard deviation of a sample of size 60 are found to be 145 and 40. Construct 95% confidence interval for the population mean.

27. The following represent the number of production per day turned out by 4 different workers using 5 different types of machines.

Worker	Machine types				
	A	B	C	D	E
1	4	5	3	7	6
2	6	8	6	5	4
3	7	6	7	8	8
4	3	5	4	8	2

Applying the analysis of variance technique, can it be concluded that the mean productivity is the same for different machines.

(2 x 10 = 20 Marks)