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D4BEC2101 (PAGES 2) Reg.No.....

Name: .....

FOURTH SEMESTER BA DEGREE EXAMINATION, APRIL 2023

(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. What do you mean by equally likely events?
2. From a bag containing 15 black and 10 white balls, a ball is drawn at random. What is the probability that it is black?
3. State Bayes' theorem.
4. If A and B are two events such that P(A) = 1/3 , P(B) = 1/4 and P(A∩B) = 1/8. Find P(A|B) and $P(A|B^c)$.
5. What do you mean by bivariate random variable?
6. Find the area to the left of z = 1.84
7. State the conditions for normal distribution being the approximation or limiting form of Binomial distribution.
8. Define sampling distribution of a sample mean where the samples are taken from normal distribution.
9. State central limit theorem.
10. Give the confidence interval for the mean of a Normal population when population standard deviation is known.
11. Give the confidence interval for the proportion of success of a binomial population.
12. What is non-parametric test?
13. Define ANOVA.
14. What are the applications of F -test.
15. Write down the test statistic for testing the equality of two population proportions.

SECTION B: Answer the following questions. Each carries *five* marks.

(Ceiling 35 Marks)

16. A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is 1/7 and that of wife's selection is 1/5. What is the probability that

    (i) Both of them will be selected.

    (ii) Only one of them will be selected.

    (ii) None of them will be selected.

(PTO)

17. A class consists of 50 students, 20 of them are girls and 30 boys, 10 of them are rich and remaining poor, 15 of them are fair complexioned. What is the probability of selecting a fair complexioned rich girl?
18. A random variable X has the following probability function :

x	0	1	2	3	4	5	6	7
f(x)	0	2k	3k	k	2k	K^2	$7k^2$	$2k^2 + k$

Find : (i) K (ii) P($0 < X < 5$)

19. The yield per acre of crop in a particular area is observed to follow a normal distribution with mean 150 quintals and standard deviation 50 quintals. Find (i) the proportion of area yielding at least 250 quintals ; (ii) What extent of land under the crop can yield between 100 and 200 quintals , if the total area under crop is 100 acres.
20. Define Chi - square distribution. Write down its properties and its applications.
21. Define the following:
(i) Unbiasedness (ii) Estimate (iii) Sufficiency
22. What are the steps involved in testing of hypothesis.
23. The mean life time of a sample of 400 fluorescent light bulbs produced by a company is found to be 1570 hours with a standard deviation of 150 hours. Test the hypothesis that the mean life time of the bulbs produced by the company is 1600 hours against the alternative hypothesis that it is greater than 1600 hours at 1% level of significance.

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

24. Urn I contains 2 red and 3 white balls and urn II contains 4 red and 7 white balls. Two balls are drawn at random from urn I and transferred to urn II and then 3 balls are drawn at random from urn II. What is the probability that among the three balls 2 are red and one is white?
25. Fit a Binomial distribution to the following data relating to the number of seeds germinating out of 10 on damp filter for 80 set :

X :	0	1	2	3	4	5	6	7	8	9	10
f :	6	20	28	12	8	6	0	0	0	0	0

26. What is a point estimator? Explain the properties of a good estimator.
27. Two laboratories A and B carry out independent estimates of fat content in ice-cream made by a firm. A sample is taken from each batch, halved, and the separated halves sent to the two laboratories. The fat content obtained by the laboratories is recorded below :

Batch No :	1	2	3	4	5	6	7	8	9	10
Lab. A :	7	8	7	3	8	6	9	4	7	8
Lab. B :	9	8	8	4	7	7	9	6	6	6

Is there a significant difference between the mean fat content obtained by the two laboratories A and B? (Use t- test)

(2 x 10 = 20 Marks)