D2AEC2204 **(4 Pages)** **Name.....**
Reg.No.....

SECOND SEMESTER M.A. DEGREE EXAMINATION, APRIL 2023
(Regular/Improvement/Supplementary)

ECONOMICS
FECO2C08: QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS II

Time: 3 Hours **Maximum Weightage: 30**

Part A: Multiple choice questions. Answer *all* questions. Each carries $^1/_5$ weightage.

1. Chance for an event may be expressed as:

   a) ratio b) proportion c) percentage d) all the above

2. Two dice are thrown, probability of getting a sum of 2 is ……..

   a) $\frac{1}{6}$ b) $\frac{1}{36}$ c) $\frac{1}{2}$ d) 0

3. If A and B are independent and P(A) = 0.3 and P(B) = 0.4, then P(A ∩ B) is

   a) 0.5 b) 0.6 c) 0.12 d) 0

4. When X follows binomial distribution, P(x = 0) is ……..

   a) 0 b) 1 c) q^n d) p^n

5. Lognormal distribution is

   a) positively skewed. (b) negatively skewed.
   c) symmetric distribution. d) none of these.

6. Mean of a standard normal distribution is

   a) 0 b) 1 c) μ d) 4

7. The student's t distribution is introduced by:

   a) Karl Pearson b) Laplace c) William S Gosset d) None of these

8. A single numerical used as an estimate of a population parameter is known as:

   a) a parameter b) a population mean c) an estimator d) a point estimate

(P.T.O.)

9. …….. are the values that mark the boundaries of confidence interval.

a) confidence coefficients
b) confidence limits
c) level of confidence
d) margin of error

10. Level of significance is the probability of

a) Type I error
b) Type II error
c) not committing error
d) any of the above

11. …….. test is used as a test of whether there is any association between two attributes.

a) Mann Whitney U test
b) Chi square test
c) Sign test
d) K-S test

12. Kruskal Wallis test is a non parametric form of:

a) t test
b) F test
c) ANOVA
d) None of these

13. Analysis of variance utilizes

a) χ^2 test
b) t test
c) Z test
d) F test

14. The technique of ANOVA is developed by …….

a) R. A. Fisher
b) Karl Pearson
c) Frank Wilcoxon
d) Kruskal

15. In one way ANOVA, observations are classified into ……..

a) two groups
b) three groups
c) as many required
d) many groups

(15 × $^1/_5$= 3 weightage)

Part B: Very short answer questions. Answer any *five* questions. Each carries 1 weightage.

16. Define distribution function of a random variable and write down three properties.
17. State central limit theorem. What are its applications in Statistics?
18. Define F distribution.
19. Explain the method of maximum likelihood estimation.
20. What are the steps involved in testing of hypothesis?
21. What are the axioms of probability?
22. Define a Poisson distribution with parameter λ. Obtain its mean.
23. Write a short note on Mann-Whitney-Wilcoxon U test.

(5 × 1 = 5 weightage)

Part C: Short answer questions. Answer any *seven* questions. Each carries 2 weightage.

24. State and prove Addition theorem of probability for two events.

25. The probability that a batsman scores a century in a cricket match is $\frac{1}{3}$. What is the probability that in 4 matches he will score centuries in at least 3 innings.

26. Define Normal distribution. What are its important properties?

27. Explain the inter-relationship of *t,* chi square and *F* distributions.

28. In a sample of 20 persons from a town it was seen that 7 are suffering from T.B. Find a 95% confidence interval for the proportion of T.B. patients in the town.

29. Random samples of sizes 500 and 400 are found to have means 11.5 and 10.1 respectively. Can the samples be regarded as random samples drawn from the same population whose SD is 5?

30. Explain chi square test of goodness of fit.

31. The following data gives the monthly rents (in Rs.) paid by a random sample of 25 households selected from a large city.
403, 925, 2000, 655, 1025, 750, 975, 670, 660, 800, 1200, 780, 850, 940, 550, 575, 425, 900, 525, 1800, 545, 840, 765, 920 and 1030.
Using the large sample Wilcoxon signed rank test, test the hypothesis that median rent in this city is Rs.770 against the alternative that it is higher with $\alpha = 0.05$

32. Distinguish between one way analysis and two way analysis of variance.

33. Explain the desirable properties of a good estimator?

(7 × 2 = 14 weightage)

Part D: Essay questions. Answer any *two* questions. Each carries 4 weightage.

34. i) State Baye's theorem.

ii) In a bolt factory, machine A, B and C manufacture respectively 25%, 35% and 40% of the total. Of their output 5, 4, 2 percents are defective bolts. A bolt is drawn at random from the product and is found to be defective. What is the probability that it was manufactured by machine B?

35. The following data shows the number of seeds germinating out of 5 ib damp filter for 80 set of seeds. Fit a binomial distribution of this data.

x	0	1	2	3	4	5
f	6	20	22	18	8	6

(P.T.O.)

36. The following data relates to marital status and performance in an examination. Examine whether the performance depends on marital status.

	Good Performance	Bad Performance
Married	60	80
Unmarried	20	40

37. The time in minutes required to finish a particular task by 4 workers using five different machines are given below. Test whether: i) the mean time to finish the task is same for different machines; ii) the mean time is same for different workers.

	Machine type				
Workers	A	B	C	D	E
1	7	8	6	7	3
2	6	7	8	7	8
3	3	5	4	4	2
4	2	4	6	8	5

(2 × 4 = 8 weightage)