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PRESIDENCY UNIVERSITY BENGALURU

**SET-B**

SCHOOL OF COMMERCE

**END TERM EXAMINATION – MAY/JUNE 2024**

**Semester :** Semester II - 2023

**Course Code :** BSE2039

**Course Name :**  Applied Statistics

**Program :** B.Sc. Economics

**Date :** June 18, 2024

**Time :** 9:30 AM - 12:30 PM

**Max Marks :** 100

**Weightage:** 50%

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

**PART - A**

**ANSWER ANY 5 QUESTIONS 5Q X 2M = 10M**

* 1. In country wide statistical survey, which method of sampling technique is more suitable, justify.

(CO1) [Knowledge]

* 1. Define age specific fertility rate.

(CO2) [Knowledge]

* 1. Two unbiased dice is thrown, find the probability that both dice show up same number.

(CO3) [Knowledge]

* 1. Define two tailed and one tailed test of hypothesis.
  2. What do you understand by an unbiased and efficient estimator?
  3. State central limit theorem.

(CO4) [Knowledge] (CO1,CO5) [Knowledge] (CO3) [Knowledge]

* 1. State the expression of Z statistic in case of testing hypothesis about population mean.

(CO4,CO5) [Knowledge]

**PART - B**

**ANSWER ANY 5 QUESTIONS 5Q X 10M = 50M**

* 1. Classify statistical data based on different characteristics.

(CO1) [Comprehension]

* 1. Discuss sampling theory and its objectives.
  2. Write a note on discrete random variable and probability mass function.
  3. Explain statistical hypothesis testing procedure.

(CO2) [Comprehension] (CO3) [Comprehension] (CO4) [Comprehension]

* 1. In a random selection of 64 out of 2400 intersections per year in the city highway, the mean number of scooter accident is 4 per year with standard deviation 0.5. Construct an interval estimate of the average scooter accidents in a year at 95% confidence level (Ztable=1.96).

(CO5,CO3) [Comprehension]

* 1. Discuss normal distribution and standard normal distribution.
  2. Write a short note on F distribution.

(CO3) [Comprehension] (CO4) [Comprehension]

**PART - C**

**ANSWER ANY 2 QUESTIONS 2Q X 20M = 40M**

* 1. Calculate the measures like **CBR, GFR, ASFR, TFR, GRR** for the following data. Total population in the region is 22000000 and 49.5% of the population is female.

Women

Women

Total No. Total No. of

|  |  |  |  |
| --- | --- | --- | --- |
| Age groups | Mid-year Population | of live Births | Female live births |
| 15-19 | 342652 | 2568 | 1198 |
| 20-24 | 408640 | 22345 | 10846 |
| 25-29 | 2406812 | 25623 | 13111 |
| 30-34 | 2512633 | 33489 | 15748 |
| 35-39 | 2845213 | 17542 | 7635 |
| 40-44 | 142561 | 8635 | 5442 |
| 45-49 | 573489 | 157 | 74 |

(CO2) [Application]

* 1. An electronic equipment manufacturing company produces 5000 units of a sophisticated product in a year. The past three years records show that the product is normally distributed with mean: μ = 22776 hrs with standard deviation of 2628 hrs. (Z table will be given)
     1. What proportion of the product (out of 5000) will fail before 25000 hrs.
     2. What proportion of the product (out of 5000) will fail before 20000 hrs
     3. What should the average life have to be to ensure that not more than 20% of the product will fail before 22776 hrs.
     4. What proportion of the product will fail between 24000 to 25000 hrs.

(CO3) [Application]

* 1. A medical drug is expected to have weight of chemical component A of 50mg. From a random sample of 100 packets selected from the drugs showed that average weight of chemical component A in the drug is 45mg with standard deviation of 4 mg. Construct interval estimate for the expected weight based on observations from sample at 5% level of significance and test if the difference is statistically significant at 5% level of significance

(CO4) [Application]