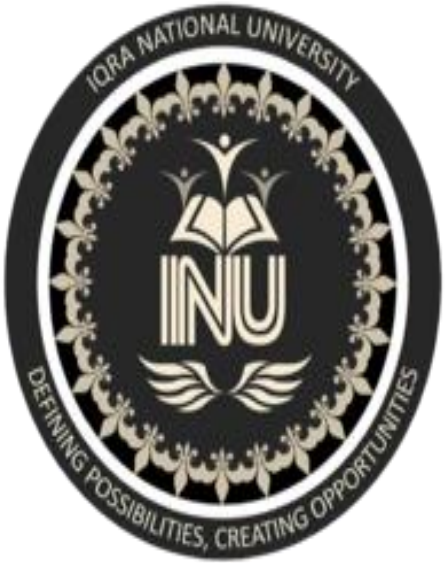
4/18/2020



IQRA NATIONAL UNIVERSITY

Name: Sifatullah
ID: #14678
Subject: Statistical Inference
Semester: 4th
Submitted to: Ms. Wajiha Amin
Exam: Midterm

School of Management and Social Sciences (Dept. of Business Administration)

Midterm Spring 2020

Course Code: ASC 226 **Course Title: Statistical Inference**

Instructor: Ms. Wajiha Amin

Total Marks: 30 **ID: #14678**

Instructions:

- **Download the given question paper.**
- **Attempt the questions in MS word without showing any calculations and upload the MS Word file on SIC under the icon of "*upload assignment*" till 19th April 2020.**
- **No screenshots or pictures of hand written paper will be acceptable.**
- **Answers to the short questions should be attempted briefly.**

Qus1. Given that Z is a standard normal random variable, P (-1.25 ≤ Z ≤ 2.25) is **(2)**

a. 0.9878
b. 0.8413
c. 0.8822
d. 0.9332

Ans: C. 0.8822

Qus2. Given that the random variable X is normally distributed with a mean of 80 and a standard deviation of 10, P (75 < X < 90) is **(2)**

a. 0.3085
b. 0.5328
c. – 0.5328
d. 0.6915

Ans: B. 0.5328

Qus3. The portion of the universe that has been selected for analysis is called **(1)**

a. a sample.

b. a frame.

c. a parameter.

d. a statistic.

Ans: A. Sample

Qus4. A summary measure that is computed to describe a characteristic of an entire population is called **(1)**

a. a parameter.

b. a census.

c. a statistic.

d. the scientific method.

Ans: A. a parameter

Qus5. Norm Abrams, the host of Creative Cottages, suggests that the completion time of a home remodelling project is normally distributed with a mean of 150 workdays and a standard deviation of 6.5 workdays. The probability that your project will be completed between 138 and 162 workdays is: **(3)**

(b) Less than how many number of working days will 85% of time falls?

Ansb: x = 156.76

Qus6. An economist is interested in studying the incomes of consumers in a particular region. The sample standard deviation is known to be $1,000. A random sample of 35 individuals resulted in an average income of $15,000. What will be the 98% confidence interval for the mean income? **(3)**

a. $12,355 and $14,756

b. $14,655 and $ 15,345

c. $14,000 and $16,112

d. $14,670.5 and $15,329.5

Ans: B. $14,655 & $15,345

Qus7. Normal distribution is the continuous probability distribution that has **(1)**

a. Positive skewness

b. Negative skewness

c. Zero skewness

Ans: C. Zero Skewness

Qus8. Consider the given set of population.

{4 ,5, 5, 7, 11, 2 ,9}

How many samples will be drawn with the sample size of 3, if sampling is done both with and without replacement? (Just write the total number!) **(3)**

Ans:

1. **Number of sample with replacement = 343**
2. **Number of sample without replacement = 35**

Qus9. (a) The registrar of a college is asked to conduct the survey among 4000 population of students. He is planning to do the probability sampling for selecting 200 students as a sample to measure satisfaction level of students with the quality of campus life. What type/types of probability sampling method would you take and why? Justify your selection method. **(3)**

Ans: Simple random sampling:

In a simple random sample, every member of the population has an equal chance of being selected. Your sampling frame should include the whole population

Example:

You want to select a simple random sample of 150 employees of Company X. You assign a number to every employee in the company database from 1 to 1500, and use a random number generator to select 150 numbers.

Because this is the simplest of all probability sampling techniques; however, the simplicity is also the strength of this technique. Because the sampling frame is not subdivided or

partitioned, the sample is unbiased and the inferences are most generalizable amongst all probability sampling techniques.

(b) If students are divided on the basis of gender, semester etc., what kind of sampling would it be and what can be its advantages? **(3)**

Ans: It is stratified random sampling and following are the advantages of stratified random sampling.

- Provides greater precision than a SRS (simple random sample) of the same size
- Often requires a smaller sample, which saves money
- Can guard against an "unrepresentative" sample
- Focuses on important subpopulations but ignores irrelevant ones
- If measurements within strata have lower standard deviation, stratification gives smaller error in estimation

Qus10. Determine the table values for z and t **(5)**

- Z= -2.96
  Ans: Z = 0.0015
- Z= 4.60
  Ans: Z = 0.9999
- Z value when CI is 65%
  Ans: Z = 0.49
- N= 30 at 75% CI
  Ans: N = 29
- N= 14 at 50% CI
  Ans: N = 0.6938

Qus11. (a)Users of a large computer system have been complaining about its slow response time. Management has decided to study the problem. Project guidelines requires 80% confidence in the results and maximum allowable level of error to be 0.5 A small pilot study shows the variance to be 2.25. How large a sample should be taken?

Ans: n = 15

(b) What would be the margin of error if sample of 30 is taken? **(2+1=3)**

Ans: € = 0.353281