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 **Statistical inference**

 **Total marks 80**

**Question 08**

**Answer:**

**A: exceeds 2750**

**Solution:**

Mean = 2500

Standard deviation = 175

Exceeds 2750

Formula:

 Z = X- mean / standard deviation.

Z= (X>2750)?

Z= 2750-2500/175

Z= 1.428

P(X>2750)

P=(Z) 0.142

Z= 0.55567

**B: Less then 2450**

P=(X<2450) ?

Z= X- mean/standard deviation

Z=2450-2500/175

Z=-0.285

P=(X<2450)

P=(Z) -0.285

P=0.38974

**C: In between 1900 and 2600**

**Solution**

P(1900<X<2600)

Z1= 1900-2500/175

Z1= -3.428

P=(X<1900)

P=(Z) 0.00031

Z2= 2600-2500/175

Z2= 0.571

P=(X<2600)

P=(Z) 0.71566

= 0.00031-0.071566

= -0.071256

**Question 06 a**

**Answer:**

**Probability and non-probability sampling:**

In probability sampling every individual has chance to be selected in research while in non-probability every individual does not have chance to be selected. Non probability is used when research is conducted over specific matter

**Parameters and statistics:**

Parameters are numbers that summarises data from whole population while statistics summarise data from target audience mean sample.

**Cluster and stratified sampling:**

Both are the method of sampling. In cluster sampling population is divided into cluster like a cluster people of hayatabad and another cluster pepole of mardan. While in stratified sampling whole population is divided into unique groups like age, gender or qualification wise.

**B:**

**Answer:**

non-Probability sampling would be more effective if I conduct survey in university. It is because issues are with some students not with all. But we can also use probability method because we will check whether other students also have the same issues or not.

**Question 2(a)**

**Answer:**

N=250

X=107

C.I= 90%

α= 10% =0.1 α /2= 0.05

1-0.05=0.95

P=X/n = 107/250 = 0.428

P-Z α/2 . √p(1-p)/n < Ä < p+ z α/2 √ p(1-p)/n

(0.428) - (1.65) (0.0312) < Ä < 0.428 + (1.65) (0.0312)

0.376 < Ä < 0.479. answer

**B:**

**ANSWER:**

**Point estimate:**

Point estimate uses single value to estimate different parameters such as standard deviation, mean average etc. It takes random sample and represent whole population. The aquericy of point estimate is not good.

**Interval estimate:**

Interval estimate does not use single value to estimate. It uses a range of different values in which anyone could be right.

**Question 1 a:**

**Answer 1a:**

 n1= 50

 n2= 28

x̄1= 5.5

x̄2= 6.7

S1(2) 9

S2(2)= 16

C.I= 80%

Α= 20%= 0.2

α/2= 0.2/2 = 0.1

Tα/2 = 2.457

S.p= √(n-1) S1(2) + (n2-1) s2(2)/ (n1+n2-2)

S.P √(49)(9) + (27) (16)/76

s.p 441+ 432/76

s.p = 3.38

(x̄1- x̄2) - tα/2. S.P √1/n1=1/n2 <µ1-µ2< (x̄1-x̄2) + tα/2. S.P √1/n1+1/n2

(-1.2) - (1.03) <µ1-µ2 < (-1.2) + (1.03)

-2.23 < µ1-µ2 < -0.17

**B:**

**Answer:**

 **Z**- test is used to compare population mean with sample. It is used when we know the population size. And when population size is more than 30. On the other hand, T-test is used when we want to test hypothesis. It is used when the population size is less than 30.

**Question no 3a**

**Answer:**

ó= 100

N= 100

X= 870,000

C.I = 90%

C.I = 98%

C.I = 90%

α = 10% = 0.1

α/2 = 0.05

1-0.05= 0.95

Z α/2 = 1.6+0.05= 1.65

X̄-Zα/2 . ó/ √ n

870,000 – 1.65 (1000/10) < µ < 870,000 +1.65 (1000/10)

869835 < µ < 870165

C.I 98%

Α 2% = 0.02

α/2= 0.01

1-0.01= 0.99

Zα/2 = 2.53

870,000 – 2.33 (100) < µ < 870,000 + 2.53 (1000)

869767 < µ < 870,233

**3b:**

Answer:

If the level of confidence increases the size of confidence interval decreases.

**Question 4 b**

**Answer:**

N=12

X= 7.5

ó= 2.4

C.I= 99

α= 1= 0.01

α/2= 0.005

1-0.005. 0.995

Z α/2 = 2.58

7.3- 2.58 (2.4÷3.46) < µ < 7.3 + 2.58 (2.4÷3.46)

7.3-1.79 < µ < 7.3 + 1.79

5.51 < µ < 9.09

Question 04 a

Answer

Sample size ?

N= 1-96\*2 \* 400\*2/50\*2

N= 245.86

N=246.

**Question 05**

**Answer**

**1:** zero and one

2: decrease

3: t-test

4: 95%

5: Identify the followings

A: 2.2

B: 0.2

C: 20

6:

1: 8

2: 4

3: 81

4: 80

7: point estimate

8: standard error

9:true

10: 95%

**Question 07**

**Answer 07:**

**1:** 99936

2: 99906

3: 70884

4: 89617

5: 0.4006