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B2**

**Q13) A machine is set to produce metal plates of thickness 1.5 cms with standard deviation 0.2 cm. A sample of 100 plates produced by the machine gave an average thickness of 1.52 cms .Is the machine fulfilling the purpose?**

**Code**

# pm=1.5 # population mean

# sm=1.52 # sample mean

# sd=0.2 # standard deviation of sample

# n= 100 # size of sample

# zcal= abs((sm-pm)/(sd/sqrt(n)))

# cat("absolute value of z-calculated is ",zcal)

# cat("name & rollno","Devansh & 1914078")

# Output

# 

**Answer**

# H0:=

# H1:

# Nature of the test is two tailed

# LOS is 5%

# Table value of Z is 1.96

# (using R software) =1

# Zalpha

Yes we can say that the machine is fulfilling the purpose.

# Q33) Ten individual are chosen at random from a population & heights are found to be 63, 63, 64, 65, 66, 69, 69, 70, 70, 71.inches. Discuss the suggestion that the height of universe is 65 inches

# CODE

# pm=65

# x <- c(63,63,64,65,66,69,69,70,70 , 71)

# smean =mean(x)

# sdeviation=sd (x)

# n= 10

# tcal= abs((smean-pm)/(sdeviation/sqrt(n-1)))

# cat("absolute value of t-calculated is ",tcal)

# cat("name &rollno","Devansh & 1914078")

# Output

# 

# Answer

1. **H0:=**

# H1:

# Nature of the test is two tailed

# Degree of freedom=n-1 =9

# LOS is 5% Table value of t is 2.26

# =1.918806(using R software)

# Talpha value of t so H0 is accepted

# Conclusion: The height of universe is 65 inches.

**Q44) Six guinea pigs injected with 0.5 mg of a medication took on an average 15.4 secs to fall asleep with an unbiased standard deviation 2.2 sec while six other guinea pigs injected with 1.5 mg of the medication took on an average 11.2 sec to fall asleep with an unbiased standard deviation 2.6 sec. Use 5% level of significance to test the null hypothesis that the difference in dosage has no effects.**

# CODE

sm1= 15.4

sm2= 11.2

sd1=2.2

sd2= 2.6 # standard deviation of sample2

n1= 6 # size of sample 1

n2= 6 # size of sample 2

tcal= abs((sm1-sm2)/sqrt((((n1-1)\*sd1^2+(n2-1)\*sd2^2)/(n1+n2-2))\*((1/n1)+(1/n2))))

cat("absolute value of t-calculated is ",tcal)

cat("name &rollno","Devansh & 1914078")

# Output:

# 

**Answer**

# H0: =

# H1:

# Nature of the test is one tailed

# Degree of freedom= n1+n2-2=10

# LOS is 5%

# T alpha = 1.761 =

# = 3.020619 (using R software)

# Talpha value of t so H0 is accepted

# Conclusion: The null hypothesis is rejected