STA 126

CAT

a) Differentiate between the following terms

i. Parametric and non-parametric tests (2marks)

ii. Type I and Type II error (2marks)

iii. Statistics and statistic (2marks)

b) For several years a teacher has kept records of how long it takes students to solve a difficult problem in statistics. If 64 randomly selected took an average of 32.5 mean with a variance of 10.89. Construct a 99% C.I for the mean average time it takes a student to solve this problem. (5marks)

c) In a random sample of 600 men taken from a big city 400 are found to be smokers. In another sample random sample of 900men taken from another city 450 are smokers. Do the data indicate that there is a significant difference in the habit of smoking in the two cities? (use 1% level of significance) (5 marks)

d) The marks of 500 students in an examination are normally distributed with mean of 45marks and standard deviation of 20marks.

i. Given that the pass mark is 41, estimate number of candidates who passed examination (4marks)

ii. If 5% of the candidates obtain a distinction by scoring X marks or more, estimate the value of X (5marks)

e) The management of a large hospital states that the mean age of its patients is 45 years. Records of a random sample of 100 patients give 48.4 as the mean age. Using a population standard deviation of 18 years, test at 5% significance level whether there is evidence that the management's statement is incorrect. State clearly your null and alternative hypotheses (5 marks)

$\bar{X} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= 32.5 \pm 2.58 \cdot \frac{\sqrt{10.89}}{\sqrt{64}}$

$- < \mu < -$

$1.96 \times \frac{18}{10}$

$48.4 + 3.528$

51.928

44.872