Total No. of Questions – [03]

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PRN.	

PAPER CODE	U222-231(ESE)

MAY 2022 -ENDSEM EXAM

S.Y. B. TECH.(COMPUTER ENGINEERING)(SEMESTER - II)

COURSE NAME: PROBABILITY AND STATISTICS

COURSE CODE: ES22201CS

(PATTERN 2020)

Time: [1Hr]

[Max. Marks: 30]

Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **'a' part of every question is compulsory**
3) **Use of scientific calculator is allowed**
4) **Use suitable data whereever required**

Q.1 a) Elaborates the types of sampling [4]

b) In a typical car, bell housings are bolted to crankcase castings by means of a series of 13 mm bolts. A random sample of 12 bolt-hole diameters is checked as part of a quality control process and found to have a variance of 0.0013 mm. (a) Construct the 95% confidence interval for the variance of the holes. (b) Find the 95% confidence interval for the standard deviation of the holes, assuming an approximately normal distribution. [6]

OR

b) A random sample of n=50 males shown mean average daily intake of dairy products equal to 756 gms with standard deviation of 35 gm. Find 99% confidence interval for population mean, assuming an approximately normal distribution. [6]

Q2 a) Discuss Type I and Type II error. [4]

b) A factory has a machine that dispenses 80 ml of fluid into a bottle. An employee believes that the average amount of fluid isn't 80 ml Using 40 samples, he measures the average amount dispensed by the machine to be 78 ml with a sample standard deviation of 2.5 ml. State the null and alternative hypothesis at a 95% confidence level, is there enough evidence to support the idea that the machine is not working properly? assuming an approximately normal distribution. [6]

OR

b) With individual lines at its various windows, a post office founds that the standard deviation for normally distributed waiting times for customers on Friday afternoon is 7.2 minutes. The post office experiments with a single main waiting line and founds that for a random sample of 25 customers, the waiting times for customers have a standard deviation of 3.5 minutes. With a significance level of 5%, test the claim that a single line causes lower variation among waiting times (shorter waiting times) for customers [6]

Q.3 a) Differentiate between Correlation and Regression [4]

b) Fit a least square line for the following data. Also find the trend values and show that $\sum(Y - \hat{Y}) = 0$ [6]

X	1	2	3	4	5
Y	2	5	3	8	7

OR

b) An experiment conducted on 9 different cigarette smoking subjects resulted in the following data –Calculate the correlation of coefficient between the number of cigarettes smoked and the longevity of a test subject [6]

Subject Number	Cigarettes smoked per week(averaged over the last 5 years of their life)	Number of years lived
1	25	63
2	35	68
3	10	72
4	40	62
5	85	65
6	75	46
7	60	51
8	45	60
9	50	55