Registration no:

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B.TECH
HSSM3304

5th Semester Regular / Back Examination 2015-16
BIOSTATISTICS
BRANCH: Biotech
Time: 3 Hours
Max marks: 70
Q.CODE: T157

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: **(2 x 10)**

a) Define mean, median and mode.
b) What are the types of representation of data?
c) Define axiomatic probability.
d) Define Hypothesis Testing.
e) Differentiate parameter and statistic.
f) Describe Null Hypothesis, alternate hypothesis.
g) Properties of coefficient of correlation.
h) Define standard error of statistic.
i) Define Estimation and its types.
j) Properties of Normal Curve.

Q2 a) Calculate the s.d. for the following frequency distribution of workers in a factory. **(5)**

Wages	15	20	24	28	30	32	34	38
No. of workers	25	47	53	90	75	95	30	25

b) Calculate mean and s.d. of the following data of presence of urea in the blood samples of 520 patients in a hospital. **(5)**

Range of (Mg/ll)	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
No. of Patients	15	49	50	111	89	104	66	36

Q3 a) Obtain the line of regression of x on y and estimate x when y is 6 units. For 4 0bservations on price X and supply Y the following data were obtained **(5)**

$$\sum x = 24, \sum y = 44, \sum x^2 = 164, \quad \sum y^2 = 574, \sum xy = 306$$

b) Calculate the co-efficient of correlation between marks in Mathematics and Physics for the following data **(5)**

X	20	35	15	40	10	35	30	25	45	30
Y	25	30	20	35	20	25	25	35	35	30

Q4 **a)** Two dice are tossed what is the probability that total is divisible by 3 or 4? **(5)**

b) A factory has two Machine A and B. Past records show that machine A produces 40% of the total output and Machine B the remaining 60%. Machine A produces 3% defective articles and Machine B produces 2 % defective item. An item is drawn at random and foun to be defective . what is the probability that it was produced by machine A. **(5)**

Q5 **a)** The probability of A, B and C becoming captains are 4/9, 2/9 and 1/3 respectively. The probabilities that the bonus scheme will be introduced if A, B and C becomes captains are 3/10, ½,4/5 respectively. **(5)**
i) What is the probability that the bonus scheme will be introduced ?
ii) If the bonus scheme has been introduced. What is the probability that the captain appointed was B?

b) There 2000 scooter drivers, 4000 car drivers and 6000 truck drivers all insured. The probabilities of an accident involving a scooter, a car, a truck are 0.01, 0.03 and 0.15 respectively. One of the insured drives met with an accident. What is the probability he is a scooter driver? **(5)**

Q6 **a)** The scores made by candidate in a certain test are normally distributed with mean 500 and s.d. 100 . What percentage of candidate receives the scores between 400 and 600? **(5)**

b) The mean wt of children to be 68.22 with a variance of 10.8 cm. How many children in a school of 1000 would you expect to be over 72 cm tall? **(5)**

Q7 **a)** The mean yield for one acre plot is 662 kgs with a standard deviation of 32 kgs. Assuming normal distribution, how many one acre plots in a batch of 10,000 plots would expect yield (i) over 700 kgs, (ii) over 650 kgs, (iii) What is the lowest yield of 1000 plots. **(5)**

b) The marks obtained in a certain examination follow normal distribution with mean 45 and s.d. 10. If 1000 students appeared at the examination, calculate the number of students scoring (i) less than 40 marks and (ii) more than 60 marks. **(5)**

Q8 **a)** The pulse rate of a man due to the effect of Amtas AT 25mg on different days in a month were found to be 66,65,69,70,69,71,70,63, 64 and 68. Discuss whether the mean pulse rate of the man in the month is 65b, $t_{0.05}$ for 9 d.e.f.=2.262. **(5)**

b) A fertilizer mixing machine is set to give 12 kg of nitrate for every quintal bag of fertilizer. Ten 1000 kg bags are examined. The percentage of nitrate are as follows **(5)**
11, 14 , 13, 12, 12, 13, 14, 11 , 12
Is there reason to believe that the machine is defective ? ($t_{0.05}$ for 9 d.e.f.=2.262)