

4. The following table shows the ages (X) and blood pressure (Y) of 8 persons : **20**

Age(X)	52	63	45	36	72	65	47	25
B.P.(Y)	73	68	75	78	62	65	72	82

- (a) Calculate the correlation coefficient and comment.
- (b) Obtain the regression equation of Y on X and find the expected blood pressure of a person who is 42 year old.
5. (a) Explain the use of descriptive statistics in measuring quality characteristics. **10**
- (b) Three bottling machines at Bisleri water solutions are being evaluated for their capability : **10**

Bottling Machine Standard Deviations

A	0.05
B	0.1
C	0.2

If specifications are set between 15.8 and 16.2 ounces, determine which of the machines are capable of producing within specifications.

1 Liter = 35.195 079 Ounces [UK]

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M. Tech. EXAMINATION, May 2018

(Second Semester)

(B. Scheme) (Main & Re-appear)

(BME)

BME506

BIO-MATHEMATICS

Time : 3 Hours]

[Maximum Marks : 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) Discuss the scope and purpose of biostatistics. **10**

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P.T.O.

- (b) Given that probability of Ramesh (R) winning, drawing and losing a game against Suresh (S) are $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{4}$ respectively. Each player gets 2, 1 and 0 points for a win, draw and loss respectively in a game. Let P1 and P2 be the points scored by A and B respectively.

Find : **10**

- (i) $P(P1 > P2)$
- (ii) $P(P1 < P2)$
- (iii) $P(P1 = P2)$

2. (a) Suppose Infosys, TCS and Wipro have 100, 50 and 75 employees respectively and 70, 50 and 60 percent of these are women. An employee is selected at random. What is the probability that it is a man ? If a randomly selected employee is found to be a woman what is the probability that she works in TCS ? **10**

- (b) Discuss and define ROC. For the given table find the estimates of the values and their standard errors : **10**

Diagnosis	Test Result	
	+ive	-ive
+ive	30	3
-ive	20	42

3. Several intelligence tests follow a normal distribution with a mean of 100 and a standard deviation of 15. For a population of 2,500, determine : **20**

- (a) Percentage of the population that would obtain a score between 95 and 110.
- (b) What interval centered at a score of 100 contains 50% of the population ?
- (c) How many are expected to have a score above 125 ?
- (d) How many are expected to have a score within two standard deviations ?

6. State and explain, cardiovascular system equations satisfying the properties of blood flow. **20**
7. Answer the following questions (any *two*) :
- (a) Suggest a mathematical model for phenomena of respiration **10**
 - (b) Tabulate the ANOVA table in one way classification **10**
 - (c) Markovian Chain.
8. Statistics students believe that the mean score on the first statistics test is 65. A statistics instructor thinks the mean score is higher than 65. He samples ten statistics students and obtains the scores 65, 65, 70, 67, 66, 63, 63, 68, 72, 71. He performs a hypothesis test using a 5% level of significance. The data are from a normal distribution. Discuss the above hypothesis in detail with result. **20**

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