Dr. Saurav Srivastava.

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-1 EXAMINATION- FEBRUARY-2019

B.Tech. IV Semester

COURSE CODE: 10B11MA421

COURSE NAME: BIOSTATISTICS MAX. MARKS: 15

COURSE CREDITS: 03 MAX. TIME: 1 HR

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Scientific calculator is allowed.*

1. A study assess the capability of subsurface flow wetland systems to remove biochemical oxygen demand (BOD) and various other chemical constituents resulted in the accompanying data on $x =$ BOD mass loading (kg/ha/d) and $y =$ BOD mass removal(kg/ha/d). Values of relevant summary quantities are; $n = 14, \sum x_i = 517, \sum y_i = 346, \sum x_i^2 = 39095, \sum y_i^2 = 17454, \sum x_i y_i = 25825$ .Obtain the equation of linear regression of the form $\mu_{Y/x} = \alpha + \beta x$ **[3] [CO1]**

2. The following data are given; **[4] [CO1]**

Y	2	3	1	5
X_1	1	2	1	4
X_2	2	3	4	3

Fit a multiple regression model using matrix method.

3. Write the 95% confidence intervals for the intercept and slope of linear regression equation. **[2] [CO1]**

4. Calculate the coefficient of correlation and test the hypothesis that $\rho = 0$ against the alternate hypothesis $\rho \neq 0$ at the 0.05 level of significance for the recorded data as follows; **[3] [CO1]**

X	-10	-5	0	5	10
Y	5	9	7	11	13

[Given that for $n = 3, t = 3.182$ at 0.05 level of significance].

5. The weights of 5 people before they stopped smoking and 5 weeks after they stopped smoking, in kilograms, are as follows;

Individual	1	2	3	4	5
Before	66	80	69	52	75
After	71	82	68	56	73

Use the Wilcoxon signed rank test for paired observations to test the hypothesis, at the 0.05 level of significance, that giving up smoking has no effect on a person's weight against the alternative that one's weight increases if he or she quits smoking. **[Given that for $n = 5, w_+ \leq 1$]** **[3] [CO2]**

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