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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-1 EXAMINATION- FEBRUARY-2020
B. Tech. II Semester (BI Branch)

COURSE CODE: 18B11MA411

MAX. MARKS: 15

COURSE NAME: BIOSTATISTICS

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. Use of scientific calculator is allowed.

1. The following data are the rates of oxygen consumption of birds, measured at different environmental temperatures:

Temperature(^{0}C)	-18	-15	-10	-5	0	5	10	19
Oxygen Consumption(ml/g/hr)	5.2	4.7	4.5	3.6	3.4	3.1	2.7	1.8

Estimate the simple regression model for oxygen consumption.   [3][CO-1]

2. Find a 95% confidence interval for β_1 in the regression line $y = \beta_0 + \beta_1 x$ based on the pollution data as follows;

$n = 33, s_{xx} = 4152.18, s_{xy} = 3752.09, s_{yy} = 3713.88, t_{0.025,31df} \approx 2.045$ [2][CO-2]

3. Fit a multiple regression model using *matrix method* for the following data;

Y	3	4	2	5
X$_1$	2	3	2	5
X$_2$	3	4	5	4

[4][CO-1]

4. The following are the measurements of breaking strength of a certain kind of 2-inch cotton ribbon in pounds:

163	165	160	189	161	171	158	151	169	162
163	139	172	165	148	166	172	163	187	173

Use the sign test to test the null hypothesis $\mu = 160$ against the hypothesis $\mu > 160$ at the 0.05 level of significance.[Given that: Cumulative probability at Z=2.012 is 0.97778 }   [3][CO-3]

5. The following data shows the duration of tolerance of pain by 8 mice before and after the administration of a drug (dose of adrenalin 0.04 mg/20g body weight). Does the data provide sufficient evidence in support that the drug increases the duration of endurance of pain?

Before Drug	15.5	12.7	14.8	16.7	20.1	22.0	20.2	18.1
After Drug	21.2	20.1	17.2	22.7	20.0	19.8	19.8	18.8

(Given that critical value of u=11).   [3][CO-3]