BIRLA INSTITUTE OF TECNOLOGY AND SCIENCE – PILANI
PILANI CAMPUS
Second Semester 2021 – 2022
Course No.: **PHA G546**   Course Title: **Pharmaceutical Biostatistics**
Comprehensive Exam (Open Book)
Max. Marks: **40**   Duration: **180 min.**   Date: **6/5/2022**

1. You are testing 3 compounds for having anti-anxiety potential via marble burry method using rats. The number of marbles buried by different group (treatments) of rats is listed in the table below. You want to know if data obtained in the study provide sufficient evidence to indicate that the four treatments differ with respect to mean number of marbles hidden when the probability of committing a type I error is 0.01. Consider the distribution to be normal   [12]

Control Group	Treatment 1	Treatment 2	Treatment 3
9	9	10	12
8	12	6	14
11	14	9	11
7	11	9	13
8	13	10	11

2. A random sample of 5 healthy children aged between 5-10 years yielded the following data.   X: represents the age of the child, Y: represents the liver volume per unit weight (ml/Kg).   From the data, obtain the linear regression line (equation) for Y and calculate the coefficient of determination.   [12]

X (Age in yrs)	Y (liver volume per unit weight (ml/Kg)
2	18
4	21
5	24
6	24
8	32

3. A herd of 1000 monkeys was fed a high fat diet for a month. After one month 30 monkeys among them were randomly weighed and had gained an average of 3.7 Kg. If the standard deviation of weight gain for the entire herd is 4.1, test the hypothesis that the average weight gain per monkey for the month was more than 2 Kg. [α=0.05]. Distribution is normal. [6]

4. The table below shows the blood levels of pesticide (ppm) in subjects from 3 different states. A research group decided to evaluate if there is difference between blood levels of pesticide in the people from 3 different states. Test the claim at α=0.05. You cannot be sure about the distribution of blood levels of pesticide in the population. [10]

Levels of pesticide in Blood (ppm)		
State1	State 2	State 3
8.2	10.2	13.5
10.3	9.1	8.4
9.1	13.9	9.6
12.6	14.5	13.8
11.4	9.1	17.4
13.2	16.4	15.3