Mid-West University
Examinations Management Office
End Semester Examinations 2081

Bachelor level/ B.Sc./ 6th Semester
Time: 3 hours
Subject: Biostatistics (BIOSTAT465)

Full Marks: 60
Pass Marks: 30

Candidates are required to give their answer in their own words as far as Practicable. The figures in the margin indicate full marks.

Group-A

Attempt all the questions [6×4=24]

1. Discuss different types of data and their sources. Also discuss types of biological data.

2. The weight of flour bag in each of 70 packets of a certain brand was measured in kg.

Weight (kg)	24.6-24.7	24.7-24.8	24.8-24.9	24.9-25.0	25.0-25.1
No. of packets	8	30	15	10	7

Find mean, standard deviation and coefficient of variation of weight flour bags.

3. Find the suitable measure of skewness for the following distribution. Also interpret the shape of distribution.

Weight in (gm)	100 or less	101-110	111-120	121-130	131 or above
frequency	3	14	22	19	7

4. In trying to evaluate the effectiveness of antibiotics in killing bacteria, a research institution complied the following information.

Antibiotics in mg (X)	13	15	14	16	17	10
Bacteria (Y)	5	7	5.6	7.2	8.6	6.2

Fit a regression line of Y on X, also estimate bacteria when antibiotics is 20 mg.

OR

Two independent samples of 7 and 6 its respectively have the following values of varieties.

Weight in lbs						
Sample A	9	11	13	11	15	9	12
Sample B	10	12	10	14	9	8	

Can you conclude that the mean weight of sample A is more than sample B. Use 1% level of significance?

Group-B

Attempt all the questions [4×6=24]

5. Explain the importance of bio-statistics in biological sciences.

6. What do you understand by measure of dispersion? Also write down characteristic of ideal measure of dispersion.

7. Panel of two judges A and B graded 7 dramatic performance by independently awarding marks as follows

Performance	1	2	3	4	5	6	7
Marks by A(x)	46	42	44	40	43	41	45
Marks by B(Y)	40	38	36	35	39	37	41

Find rank correlation coefficient. Also comment results.

8. Define conditional probability. A basket contains 8 apples of which 3 are bad. Two apples are picked one by one without replacement. Fine the probability that both are bad apples.

9. Infections sometimes occur when blood transfusions are given during surgical operations. An experiment was conducted to determine whether the injection of antibodies reduced the probability of infection. An examination of records of 140 patients produced the data shown in the table. Do the data provide the sufficient evidence to indicate that injection of antibodies affect the livelihood of transfusion? Test by using $\alpha = 0.05$

	Infection	No. of infection
Antibody	6	78
No. of antibody	11	45

10. What do you mean by estimation? One hundred and fifty bags of flour are taken from a production line and found to have mean 748 g and standard deviation 3.6 g. Calculate 95% confidence interval for the mean mass of a bag of flour produced on this production line.

OR

What are the uses of normal distribution? Height of boys at a particular age follow a normal distribution with mean 150.3cm and variance 25cm^2. Find the probability that a boy picked up at random and from this age group has height less than 153cm.

Group-C

Attempt all the questions [2×6=12]

11. Construct a histogram and frequency curve, from the following grouped frequency distribution.

Class Interval	5-10	10-15	15-20	20-25	25-30	30-35
Frequency	2	5	7	12	6	3

12. What do you understand by skewness and kurtosis?

13. Find the five numbers summary from the following data
    5, 12, 8, 15, 17, 10, 13

14. A random variable X has the following probability mass function

X	0	1	2	3
P (X=x)	1/8	3/8	3/8	1/8

Find expected value of X.

15. Write down the properties of binomial distribution.

16. Discuss on causes of variation in statistical quality control.

The End