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The Assam Royal Global University, Guwahati

Royal School of Pharmacy

B. Pharmacy 8th Semester

Semester End Examination, June 2023

Course Title: Biostatistics and Research Methodology

Course Code: PHR232C801

Time: 3 Hours

Maximum Marks: 75

Note: Attempt all questions as per instructions given.

The figures in the right-hand margin indicate marks.

Section – A

1. Attempt **all** questions. (Maximum word limit 50) 2.5 x 8

- a. Define mode of a frequency distribution with an example.
- b. If mean of 4, 5, 10, x , 17 is 11 then find the value of x .
- c. Define binomial distribution and when do we use it?
- d. What is Type-I and Type-II error?
- e. Define extraneous variables.
- f. What do you understand by sampling error?
- g. Mention any advantages of 2^2 factorial design.
- h. Mention any two applications of SPSS.

2. Attempt **any one** of the following: 13 x 1

- a. (i) If the median and mode of the following frequency distribution are 33.5 and 34 respectively then find the values of f_3 , f_4 and f_5 from the following data with given total frequency $N = 230$.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency f	4	16	f_3	f_4	f_5	6	4

(ii) Write two merits and two demerits each of mean, median and mode.

- b. (i) Calculate the coefficient of correlation between X and Y for the following:

X	1	3	4	5	7	8	10
Y	2	6	8	10	14	16	20

(ii) Calculate the mean and standard deviation for the following table giving the age distribution of 542 members.

Age in years	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of members	3	61	132	153	140	51	2

3. Attempt **any two** of the following: 7 x 2

a. Obtain the line of regression of Y on X from the following data.

X	6	2	8	4	10
Y	7	9	5	6	8

b. (i) Ten coins are thrown simultaneously. Find the probability of getting at least three heads.

(ii) A manufacturer who produces medicine bottles, finds that 0.1% of the bottles are defective. The bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the producer of bottles. Find how many boxes will contain at least two defective bottles.

c. Drug A and Drug B were used on 6 patients and 5 patients for reducing their weight. The decrease in the weight (in kg) after using the drugs for 90 days are given below.

Drug A : 8, 10, 12, 9, 14, 13 and

Drug B : 7, 9, 14, 12, 8

Is the drug efficient at 5% level of significance? Given tabulated value of $t_{0.01,9} = 2.262$

Section – B

4. Attempt **any two** of the following: 7 x 2

- Define research. Write down the objectives of research study.
- Explain the various steps involved in research report writing.
- Give an overview on the various experiential Design Techniques.

5. Attempt **any two** of the following: 7 x 2

- What is factorial design? Explain with suitable examples.
- What is regression modelling? Write a note on simple regression analysis.
- Briefly explain about central composite design.
