Total No. of printed pages = 4

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Roll No. of candidate | | | | | | | | | | |

2024

B.Pharm. 8th Semester (Regular) End-Term Examination

BIO-STATISTICS AND RESEARCH METHODOLOGY – THEORY

(New Regulation w.e.f. 2017-18)

Full Marks – 75 Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Multiple choice questions (MCQ)/Answer all questions : (20 × 1 = 20)

(i) Which of the following is not a measure of Dispersion?

(a) Mode (b) Range

(c) Standard deviation (d) Variance

(ii) For a distribution Mean = 33, Mode = 33.5 the Median = ————————.

(a) 33 (b) 33.4

(c) 35 (d) None of the above

(iii) The algebraic sum of the deviations of the observations from Mean is ————————.

(a) –1 (b) 1

(c) 0 (d) all of the above

(iv) Which of the following is a continuous distribution?

(a) Binomial distribution (b) Poisson distribution

(c) Normal distribution (d) All of the above

(v) If each value of a distribution is multiplied by 2 then Mean of the whole distribution will also be ————————.

(a) Multiplied by 2 (b) Will remain same

(c) Both (a) and (b) (d) None of the above

[Turn over

(vi) The probability of a certain event is ————————.

(a) 0 (b) 1

(c) 0.5 (d) None of the above

(vii) The value of Karl Pearson's correlation co-efficient always lies between ————————.

(a) 0 and 1 (b) –1 and 0

(c) –1 and 1 (d) –0.5 to 0.5

(viii) The median of the following distribution is

23, 21, 34, 27, 28

(a) 34 (b) 27

(c) 23 (d) 28

(ix) The standard deviation of the following data is

10, 10, 10, 10, 10, 10, 10

(a) 1 (b) 0

(c) 10 (d) 7

(x) The relation between Karl Pearson's correlation coefficient and regression coefficients is ————————.

(a) $r = \sqrt{b_{xy} b_{yx}}$ (b) $r = \sqrt{b_{xy} + b_{yx}}$

(c) Both (a) and (b) (d) None of the above

(xi) Which of the following measures of Dispersion is considered to be best?

(a) Range (b) Mean Deviation

(c) Standard deviation (d) Variance

(xii) Which of the following relation is correct?

(a) Coefficient of variation $= \frac{\text{Mean}}{\text{Standard deviation}} \times 100$

(b) Coefficient of variation $= \frac{\text{S.D}}{\text{Mean}} \times 100$

(c) Both (a) and (b)

(d) None of the above

(xiii) Which of the following is probability sampling?

(a) Quota sampling (b) Purposive sampling

(c) Systematic sampling (d) None of the above

(xiv) The variance of Binomial distribution is

(a) np (b) npq

(c) $np\sqrt{npq}$ (d) All of the above

(xv) When two dice are thrown together then the total number of possible outcomes will be ————————.

(a) 6 (b) 12

(c) 24 (d) 36

(xvi) What is the name of the statistical method that involves dividing a dataset into two or more groups, where one group is the control group and the other is the experimental group?

(a) Randomized controlled trial

(b) Observational study

(c) Case-control study

(d) Cohort study

(xvii) What is the name of R package that allows you to perform data visualization?

(a) dplyr (b) tidyr

(c) ggplot2 (d) Shiny

(xviii) Cohort study is

(a) A study that follows a group of people over time

(b) A study that examines a single point in time

(c) A study that examines a specific disease or condition

(d) All of the above

(xix) Which of the following is not a type of experimental design?

(a) Randomized block design

(b) Latin square design

(c) 2 × 2 factorial design

(d) Completely randomized design

(xx) What is the purpose of the Wilcoxon Rank Sum Test?

(a) To compare the means of a continuous variable between two groups

(b) To compare the medians of a continuous variable between two groups

(c) To compare the proportions of a categorical variable between two groups

(d) To compare the distribution of a continuous variable between two groups

2. Answer any *seven* questions. (7 × 5 = 35)

(a) Compute median of the following distribution.

x:	2	4	6	8	10
f:	3	4	2	7	4

(b) What are the properties of arithmetic mean?

(c) Define mutually exclusive and independent events with examples.

(d) Calculate Karl Pearson's correlation coefficient of the following data.

X:	34	36	54	31	25
F:	42	45	32	44	27

(e) Write a note on any one of the following :

(i) Mann Whitney U test

(ii) Krushal-Wallis test

(f) What do you mean by factorial design? Write some advantages of factorial design.

(g) What are parametric tests? Briefly discuss about the one-way ANOVA.

(h) Write short note on :

Central Composite Design, Blocking and Confounding System for 2-Level factorials.

(i) Discuss the Research process with the aid of a flow chart.

3. Answer the following questions (Any *two*) : (2 × 10 = 20)

(a) What do you mean by primary data and secondary data? Write the various methods of collecting primary data.

(b) What are Probability and Non-probability samplings? Discuss one probability sampling and one non-probability sampling method.

(c) Explain the different types of graphs used in biostatistics and research methodology. What is plagiarism and why is it considered as a serious academic offence?
