**Utkal University, Vani Vihar, Bhubaneswar**

**University Department of Pharmaceutical Sciences**

**B. Pharm, 8th Sem, 2021, Subject: BP801T- Biostatistics & Research Methodology, Full Marks=75, Time=3 hours**

**Section ‘A’**

**Multiple Choice Questions (MCQ)**

1. **All the questions are compulsory (1x20=20)**

i)……………… = 3 median-2 mean

 a) Mean, b) Median, c) Mode, d) None

ii) The positive square root of variance is called …………………..

1. Mean deviation, b) Standard deviation, c) Range, d) None

iii) If A, B are mutually exclusive events then P (A) + P (B) = ………………….

1. P (AUB) b) P (A∩B) c) P (A-B) d) None

iv) ……………… is a way to systematically solve the research problem

 a) Research b) Research Methodology, c) Research Problem, d) None

v) …………….. is a process of associating numbers or symbols to observations obtained in a

 research study.

1. Measurement b) Scaling c) Validity d) None

vi) …………….. consists of a series of rectangles.

1. Line chart b) Bar chart c) Pie chart d) None

vii) ……………………… is the process of obtaining information about an entire population by examining only a part of it.

1. Sampling, b) Coding, c) Scaling, d) None

viii) …………… is the principal instrument of in research.

 a) Null hypothesis, b) Alternative hypothesis, c) Hypothesis, d) none

ix) In which type of factor analysis the correlation are computed between pairs of respondents

 in stead of pairs of variables?

1. Q-type, b) R-type, c) Both, d) none

x) Which of the following is not required in a reference list or bibliography entry

1. Call number, b) Place of publication, c) Author , d) none

xi)…………….. is the classical form of research.

1. Experiment b) Case Study, c) Grounded Theory, d) Narrative inquiry

xii) ………………. research is the naturalism.

1. Field b) Descriptive c) Basic d) Applied

xiii) E-books are ……………….

1. Paperless book b) Soft copy of book c) Normal text book in electronics version d) All

xiv) Continuous variables are represented by ……………………..

1. Histogram, b) Line diagram, c) Bar diagram, d) Pie chart

xv) Percentage of frequency distribution is represented by …………………….

1. Frequency polygon b) Ogive representation c) Pie chart d) Frequency table

xvi) Chi-Square was developed by …………………….

xvii) SPSS stands for ………………..

1. Simple Perfect Squared Square b) Statistical Product and Service Solution

 c) Statistical Package for Social Science d) Software Package for Statistical Science

xviii) MLA stands for …………………….

1. Modern Literature Art b) Modern Linguistic Association

c) Modern Language Association d) Make Life Awesome

xix) The fundamental statistical indicators are …………………

1. Mean b) Median c) variance d) Standard Deviation

xx) The cumulative frequency for a particular class is 35. The cumulative frequency for the next

 class will be ………………..

1. <35 b) =35 c) >35 d) None

**Section ‘B’**

**Long Questions (Answer 2 out of 3) (10x2=20)**

1. Set up an analysis of variance table for the following per acre production data for three varieties of rice, each grown on 4 plots and state if the variety differences are significant

|  |  |
| --- | --- |
| Plot of land | Per acre production data |
| Variety of Rice |
| A | B | C |
| 1 | 6 | 5 | 5 |
| 2 | 7 | 5 | 4 |
| 3 | 3 | 3 | 3 |
| 4 | 8 | 7 | 4 |

1. Discuss briefly Research Methodology.
2. Describe briefly Factorial Design.

**Section ‘C’**

 **Short Questions (Answer 7 out of 9) (7x5=35)**

**5.** Find the sample regression line of y on x for the sample (2, 12), (5,24),(9,33),(14,50)

6. Describe null hypothesis, alternative hypothesis, standard error,

 type-I error & type-II error.

7. Describe mean, median, mode, range & standard deviation.

8. Discuss briefly Karl Pearson’s Coefficient of Correlation.

9. Ten coins are thrown simultaneously. Find the probability of getting at least six heads.

10. Use the Kruskal-Wallis test at 5% level of significance to test the null hypothesis that a professional bowler performs equally well with the four bowling balls, given the following results: Bowling Results in Five Games

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| With Ball No. A | 271 | 282 | 257 | 248 | 262 |
| With Ball No. A | 252 | 275 | 302 | 268 | 276 |
| With Ball No. A | 260 | 255 | 239 | 246 | 266 |
| With Ball No. A | 279 | 242 | 297 | 270 | 258 |

11. Discuss different types of Graphs.

12. Describe briefly statistical analysis using excel, spss & minitab.

13. Discuss briefly simple linear regression model.