

Roll No.

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Total No. of Pages : 03

Total No. of Questions : 18

Pharm.D (Sem.-4)
BIostatistics AND RESEARCH METHODOLOGY

Subject Code : 4.4

M.Code : 71572

Date of Examination : 20-12-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTION TO CANDIDATES :

1. **SECTION-A** contain **SEVEN** questions. Attempt any **FIVE** questions. Each question will carry **TWO** marks.
2. **SECTION-B** contain **EIGHT** questions (Short Essay Type). Attempt any **SIX** questions. Each question will carry **FIVE** marks.
3. **SECTION-C** contain **THREE** questions (Long Essay Type). Attempt any **TWO** questions. Each question will carry **FIFTEEN** marks.

SECTION-A

1. What are Non-parametric tests? Can Kruskal Wallis test be applied for testing significance between two independent groups?
2. Distinguish between paired and unpaired student t-test.
3. Give types of computerized accounting system.
4. Describe case studies.
5. Write uses of computers for pharmaceutical care in community pharmacy.
6. How statistical methods can be used in epidemiological studies?
7. Define Null hypothesis and Level of significance.

SECTION-B

8. What is an Observational study? What is the best design for an observational study?
9. Write a note on sample size determination.

10. Calculate the variance and standard deviation of the following data :

| Classes | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|-------------|------|-------|-------|-------|-------|-------|-------|-------|
| Frequencies | 24 | 18 | 16 | 15 | 12 | 8 | 5 | 2 |

11. Describe elements of designing methodology for research proposal.
12. The data collected by extension workers for adoption of improved practices of wheat cultivation is given below:

| Education | Adoption | | |
|-----------------------------|------------|--------|------|
| | Nil to low | Medium | High |
| Illiterate | 6 | 24 | 9 |
| Primary | 6 | 9 | 6 |
| Middle and higher education | 6 | 8 | 11 |

(At 5% level of significance ; $X^2_2 = 5.991$, $X^2_3 = X^2_3 = 7.815$, $X^2_4 = 9.488$)

Analyse the data to test whether adoption is influenced by education of the farmer.

13. Compare Correlation and Regression analysis.
14. Write a note on computerized prescription dispensing process.
15. Give advantages of drug information retrieval system.

SECTION-C

16. **Write notes on:**
- a) Statistical Softwares
 - b) Presentation of Data.
17. Write a descriptive note on computer applications in hospital pharmacy.
18. a) Compare Mann Whitney U test and Wilcoxon signed rank test.

- b) The following data represent the number of units of production per day in five different laboratories using four different types of Equipment:

| Laboratories | Equipment Type | | | | |
|---------------------|-----------------------|----------|----------|----------|----------|
| | | A | B | C | D |
| | 1 | 36 | 42 | 49 | 32 |
| | 2 | 34 | 40 | 54 | 41 |
| | 3 | 32 | 36 | 46 | 30 |
| | 4 | 33 | 38 | 42 | 33 |
| | 5 | 38 | 42 | 41 | 38 |

- i) Test whether the mean productivity is the same for the different equipment type.
- ii) Test whether the 5 laboratories differ with respect to mean productivity.

(At 5% level of significance; $F_{3,16} = 3.24$; $F_{4,16} = 3.01$)

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.