KATHMANDU UNIVERSITY
End Semester Examination
1 – February 2024

Marks Scored:

Level : B.Pharm.
Year : IV

Course : PHAR 430
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date :

SECTION "A"
[20Q. × 1 = 20 marks]

Choose and encircle the most appropriate option from each set of choices

1. One of the following is the type of research on objective point of view……
   a. Basic research
   b. Applied research
   c. Explanatory research
   d. Quantitative research

2. The feasibility of research study should be considered in light of:
   a. Cost and time
   b. Skill of the researcher
   c. Potential ethical concerns
   d. All of the above

3. Pick individual based descriptive research:
   a. Cross-sectional
   b. Cohort
   c. Case report
   d. Quassi experiments

4. A person is given a questionnaire for inquiring his health status, the data provided is…..
   a. Primary
   b. Secondary
   c. Tertiary
   d. Indirect data

5. Which of the following best describes quantitative research?
   a. The collection of non-numerical data
   b. An attempt to confirm the research hypotheses
   c. Research that is exploratory
   d. Research to generate a new theory

6. Which of the following is characteristics of poor literature review?
   a. Narrow and Shallow
   b. Clarity
   c. Critical evaluation
   d. Conciseness

7. A specific plan or protocol for conducting research that allow researcher to transform conceptual hypothesis into practical one is…….
   a. Research problem
   b. Study design
   c. Basic research
   d. Research question

8. Which of the following features are considered as critical in qualitative research?
   a. Collecting data with the help of standardized research tools.
   b. Design sampling with probability sample techniques.
   c. Collecting data with bottom-up empirical evidence.
   d. Gathering data with top-down schematic evidence.

9. Which of the following statement is **CORRECT**?
   a. Reliability ensures the validity
   b. Validity ensures reliability
   c. Reliability and validity are independent of each other
   d. Reliability does not depend on objectivity

10. How is random sampling helpful?
    a. Reasonably accurate
    b. An economical method of data collection
    c. Free from personal biases
    d. All of the above

11. Research can be classified as:
    a. Basic, Applied and Action Research
    b. Quantitative and Qualitative Research
    c. Philosophical, Historical, Survey and Experimental Research
    d. All the above

12. Which of the following does not correspond to characteristics of research?
    a. Research is not a process
    b. Research is systematic
    c. Research is not a problem-oriented
    d. Research is not passive

13. A researcher is interested in studying the prospects of a particular political party in an urban area. So, what tool should he prefer for the study?
    a. Rating Scale b. Interview c. Questionnaire d. Schedule

14. The study in which the investigators attempt to trace an effect is known as:
    a. Survey Research
    b. 'Ex-post Facto' Research
    c. Historical Research
    d. Summative Research

15. If in a sample of 120 units, there are 26 units possessing some characteristic of study, then sample proportion is not equal to:
    a. 120/26 b. 26/120 c. 13/60 d. 0.2167

16. For inference on several population proportions _____ distribution is used.
    a. Normal b. Chi-square c. t d. F

17. The correct expression for confidence interval of population variance (σ^2) is:
    a. $P\left(\frac{(n-1)S^2}{\chi^2_{\frac{\alpha}{2},n-1}} \leq \sigma^2 \leq \frac{(n-1)S^2}{\chi^2_{1-\frac{\alpha}{2},n-1}}\right) = 1-\alpha$
    b. $P\left(\frac{(n-1)S^2}{\chi^2_{1-\frac{\alpha}{2},n-1}} \leq \sigma^2 \leq \frac{(n-1)S^2}{\chi^2_{\frac{\alpha}{2},n-1}}\right) = 1-\alpha$
    c. $P\left(\frac{\chi^2_{\frac{\alpha}{2},n-1}}{(n-1)S^2} \leq \sigma^2 \leq \frac{\chi^2_{1-\frac{\alpha}{2},n-1}}{(n-1)S^2}\right) = 1-\alpha$
    d. $P\left(\frac{\chi^2_{1-\frac{\alpha}{2},n-1}}{(n-1)S^2} \leq \sigma^2 \leq \frac{\chi^2_{\frac{\alpha}{2},n-1}}{(n-1)S^2}\right) = 1-\alpha$

18. The process of allocating treatments to one or more experimental units in a random manner to reduce bias of applying a particular treatment to a particular experimental unit is:
    a. Replication b. Randomization c. Local control d. Anova

19. The number of treatments are equal to the number of blocks (or replicates) and the treatments are allocated in such way that each of the treatment occurs only once in each and in each column in:
    a. Completely Randomized Design
    b. Randomized Block Design
    c. Latin Square Design
    d. Factorial Design

20. The correct form of statement for alternative hypothesis of ANOVA is:
    a. H_1:All population means are equal
    b. H_1:All population means are not equal
    c. H_1:All population means are different
    d. H_1:At least one population mean is different

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Indicate by checking (√) of each question you have answered in the cover page of main answer book.

SECTION "B"
[5 Q. × 3 = 15 marks]

Attempt *ANY FIVE* questions.

1. What is research? Discuss briefly on the major characteristics of a good research.
2. Write a short note on mixed method research and its significance.
3. How do you minimise the problems of data collection through questionnaire?
4. List down the research designs that come under experimental and observational.
5. List down the steps of using a random number table.
6. Suppose that we want to estimate what percentage of all drivers exceed the 55 mph speed limit on a certain stretch of road. How large a sample will we need to be at least 99% confident that the error of our estimate, the sample percentage, is at most 3.5% (=0.035)? What would the required sample size if it is known that the percentage to be estimated is at most 40% (=0.40)?
7. An investigation on certain kind of photocopy machine showed that 75 failures of this kind of machine took on the average 83.2 minutes to repair with a standard deviation of 19.3 minutes. Test the null hypothesis that $\sigma = 15.0$ minutes for the time that is required to repair this kind of photocopy machine against the alternative hypothesis that $\sigma > 15.0$ minutes. Use the 0.05 level of significance and assume normality.

SECTION "C"
[5 Q. × 5 = 25 marks]

Attempt *ANY FIVE* questions:

8. Discuss on an analytical research design with its advantages over descriptive design.
9. Explain on various steps involved for research process. Why is identifying a research question important in research?
10. A researcher aims to investigate community pharmacists' perceptions about identifying and addressing inappropriately prescribed antibiotic in a community. Discuss on the most appropriate research design for this title with associated rationale behind choosing the design.

11. Distinguish between Validity and reliability. Explain content validity and internal reliability.

12. List down the component of sample size calculations and discuss their significances.

13. Arthritis is a painful, chronic inflammation of the joints. An experiment on the side effects of 440 arthritis patients using ibuprofen as pain reliever reported that 5% of them had different types of side effects. Construct 90% confidence interval for actual percentage of arthritis patients using ibuprofen as pain reliever who observed side effects of the medicine. The company producing the medicine claims that actual percentage of patients who had side effect of the medicine is less than 7%. Test the claim of the manufacturer at 5% level.

14. Two different lighting techniques are compared by measuring the intensity of light at selected locations in areas lighted by the two methods. If 15 measurements in the first area had a standard deviation of 2.7 foot-candles and 21 measurements in the second area had a standard deviation of 4.2 foot-candles, can it be concluded that the lighting in the second area is less uniform? Use a 0.01 level of significance.

SECTION "D"

[2 Q. × 7.5 = 15 marks]

Attempt *ANY TWO* questions:

15. Describe in detail about the contents of research report with relevant example in each section.

16. Explain data collection and analysis methods in qualitative research.

17. A pharmaceutical company conducts an experiment to test the effect of a new cholesterol medication. The company selects 15 subjects randomly from a larger population. Each subject is randomly assigned to one of three treatment groups. Within each treatment group, subjects receive a different dose of the new medication. In Group 1, subjects receive 0 mg/day; in Group 2, 50 mg/day; and in Group 3, 100 mg/day. After 30 days, doctors measure the cholesterol level of each subject. The results for all 15 subjects appear in the table below:

Group 1 (0 mg)	210	240	270	270	300
Group 2 (50 mg)	210	240	240	270	270
Group 3 (100 mg)	180	210	210	210	240

Carry ANOVA at 5% level of significance to test whether dosage level have a significant effect on cholesterol level.