KATHMANDU UNIVERSITY
End Semester Examination
July/August, 2024

Marks Scored:

Level : B.Tech.
Year : III

Course : BIOT 313
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date 05 AUG 2024

SECTION "A"

[20 Q. × 0.5 = 10 marks]

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

1. Rockman writes:
In January 1848, James Marshall found gold flakes in the millrace of John Sutter's saw mill. Within months . . . the rush was on. Thousands left home, rounding the Cape, crossing the Isthmus, or joining the wagon trains headed west. Soon the easy pickings were gone, and consortia of miners banded together to blast more flakes from the hills. Extraction technologies proliferated: first rockers and long toms, then gravel dredges, and finally hydraulic mining, which washed whole mountains through giant sluices to recover dense gold flakes from the riffles.
Modern day QTN prospecting is the Sierra Nevada of the 1850s. The shiny (Mendelian) nuggets are rapidly being collected, and ever larger teams of researchers with ever more powerful technologies are now probing whole genomes to find their quarry. But visible flakes of placer gold represent a small fraction of the global gold reserve; most gold is in microscopic particles concealed in low- grade ore. If the stuff of evolution is often alleles of microscopic effect, large- effect nuggets can tell us little about the material basis for evolution. (Rockman 2012, 2)

   What does this mean?
   a. Finding a mutation that causes big phenotypic change is become ever rarer
   b. With improved technology finding mutation causing phenotypic change is easier
   c. QTN prospecting is nothing like gold searching in the wild west
   d. Gold searching in ancient times has limited parallels to modern mutation search

2. Which of the following is **NOT** one of the ideas you have to convince the review panel while writing a proposal
   a. The idea that you have an important research question
   b. The idea that your research idea is the most economical and judicious of all ideas
   c. The idea that you and your team can answer the research question
   d. The idea that the research question can be answered

3. According to the "Scientist's Guide to Writing" does all information require citation
   a. Yes every single information requires citation
   b. Very general ideas do not require citation, more specific ideas require citation
   c. Ideas from Wikipedia do not require citation, other ideas require citation
   d. Yes only information read on paper should be used and properly cited

4. How does Boyle's experimental style compare with that of modern scientists?
   a. Boyle's style was lax and lacked rigor
   b. Boyle's style was totally unnecessary
   c. Boyle laid foundation for modern day research methodology
   d. Boyle's style of experiments was in some way for stringent that modern scientists

5. What is common between empiricist and logical positivist
   a. Both believe that armchair thinking is most important to derive knowledge
   b. Both believe that knowledge is derived from thought process
   c. Both believe that knowledge is derived from facts by observation
   d. Both believe that knowledge is derive from experimentation

6. Which of the following is a falsifiable statement?
   a. Either it is raining or not raining
   b. All metals expand upon heating
   c. All tangents of a circle are perpendicular to the adjacent radius
   d. Luck is possible in sporting speculation

7. What is a criticism of the falsificationist view of science
   a. The data is heavily theory laden
   b. There is only empty consensus in science
   c. The different paradigms of science are incommensurable
   d. Not much consideration is given to the inductivist approach

8. What about Copernican revolution is true
   a. The idea was proposed by Aristotle 2000 years ago
   b. According to Copernicus, epicycles are needed to explain data
   c. Copernicus developed mechanics to drive the revolution
   d. It took over 100 years for the idea to be verified by science

9. Which of the following validity is concerned with determining if the relationship is casual between dependent and independent variables?
   a. Conclusion b. Construct c. Internal d. External

10. In 1999, Jesse Gelsinger was an 18-year-old with a rare disease who died during participation in a study.
   a. This was an example of conflict of interest for company running the study
   b. This was an example of conflicted beneficience
   c. This was an example of distorted autonomy
   d. This was an example of a wrong decision by IRB

11. Careful planning of focus group does **NOT** include the following:
   a. What will the focus group questions be?
   b. Who will be the participants?
   c. How long will the focus group take place?
   d. How will you analyze the data?

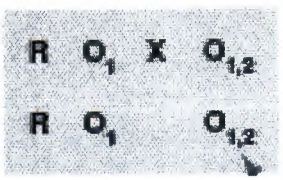
12. All the sampling methods can be broadly divided into two types. They are?
   a. Stratified and non stratified sampling methods
   b. Purposive and non purposive sampling methods
   c. Systematic and non systematic sampling methods
   d. Random and non random sampling methods

13. On a survey you might code Educational Attainment as 0 = less than high school; 1 = some high school; 2 = high school degree; 3 = some college; 4 = college degree; 5 = post college. This is an example of:
   a. Nominal scale of measurement b. Interval scale of measurement
   c. Ordinal scale of measurement d. Ratio scale of measurement

14. What is an index?
    a. Index is a composite number that measures something
    b. Index is a numerical representation of an abstract concept
    c. Index is a numerical representation of a quantitative concept
    d. Index is a qualitative representation of an abstract concept

15. What is contingency question?
    a. Question that is dependent on research
    b. Question that is dependent on answer to another question
    c. Question that is very difficult to accurately answer
    d. Question that varies with the interviewer

16. In this figure, what does R, O and X represent



    a. R means random, O means observation and X means intervention
    b. R means ratio, O means observation and X means treatment
    c. R means random, O means other intervention X means treatment
    d. R means ratio, O means other intervention and X means treatment

17. What about covariance design is true?
    a. It is a signal enhancing design
    b. It is a noise canceling design
    c. It is a design where covariance between two factors is measured
    d. It is a design where Crohnbach's alpha has to be measured

18. What makes a research design quasi?
    a. The use of both randomization and non randomization in sampling
    b. The use of randomization in sampling
    c. The use of non randomization in sample
    d. Experimental designs with no observations

19. Which of the following is **FALSE**
    a. Range is a measure of dispersion while median in a central tendency measure
    b. Range and standard deviation both measure dispersion tendency
    c. Measurement of dispersion and central tendency are part of descriptive statistics
    d. Range and mode both measure dispersion tendency

20. What about dummy variable is **TRUE**?
    a. Dummy variable is a numerical variable in GLM
    b. It often takes any value that is a whole number
    c. Dummy variables are useful because they enable you to use a single regression equation to represent multiple groups
    d. Dummy variables can sometimes be treated as interval level variable

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

SECTION "B"
[8 Q. × 2 = 16 marks]

Attempt *ANY EIGHT* questions.

1. What are the different decisions given by a journal to a paper? Describe. [2]
2. How is the theory of mind related to self-revision? Describe. [2]
3. How does Bayes' theorem relate evidence to hypothesis? Describe. [2]
4. What did Deborah Mayo say about severe experimental testing? [2]
5. What is operationalization? Describe with the help of a figure. [2]
6. Describe the thalidomide case? [2]
7. What is grounded theory? [2]
8. What is true score theory in mathematics? [2]
9. What is probing in an interview? [2]
10. What are three conditions to establishing cause and effect? [2]

SECTION "C"
[3 Q. × 4 = 12 marks]

Attempt *ANY THREE* questions.

11. What are three types of images shown in the result section? How is order of authorship in a paper determined? [2+2]
12. What is Feyerabend's opinion of science? [4]
13. What is maturation threat? Describe 2X2 factorial design. [1+3]
14. Describe the basic regression discontinuity (RD) design. How is RD analyzed using inferential statistics? [2+2]

P.T.O.

SECTION "D"

[2 Q. × 6 = 12 marks]

Attempt *ANY TWO* questions.

15. The book "Scientist's guide to writing" describes a research on star formation. Write a two hundred-word abstract and a short title of the research findings of the star formation paper. [6]

16. Compare and contrast Kuhn's paradigms with Lakatosian research programs with examples. [6]

17. What is purposive sampling? Give an example. How is Likert scale developed? Write a real or imaginary example of Likert scale. [1+1+2+2]