

**RESEARCH METHODOLOGY, BIOETHICS AND IPR
(BIOT 5103)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

Candidates are required to give answer in their own words as far as practicable.

**Group - A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) What is the name of the conceptual framework in which the research is carried out?
(a) Research hypothesis (b) Synopsis of Research
(c) Research paradigm (d) Research design
- (ii) Inferring about the whole population based on the observations made on a small part is called _____
(a) Deductive inference (b) Inductive inference
(c) Pseudo-inference (d) Objective inference
- (iii) Which one among the following statement is true in the context of the testing of hypotheses?
(a) It is only the alternative hypotheses that can be tested
(b) It is only the null hypotheses that can be tested
(c) Both the alternative and the null hypotheses can be tested
(d) Both the alternative and the null hypotheses cannot be tested
- (iv) In the process of conducting research 'Formulation of Hypothesis' is followed by
(a) Statement of objectives (b) Analysis of data
(c) Selection of research tools (d) Collection of data
- (v) A simple random sample is one in which
(a) From a random starting point, every n th unit from the sampling frame is selected.
(b) A non-probability strategy is used, making the results difficult to generalize.
(c) The researcher has a certain quota of respondents to fill for various social groups.
(d) Every unit of the population has an equal chance of being selected.

- (vi) Which of the following is (are) included in Geographical indications of goods.
(a) Foodstuff (b) Manufactured
(c) Handicraft (d) All of the above
- (vii) Bioremediation can be done very effectively by
(a) Plants (b) Microbes
(c) Metals (d) All of above
- (viii) GEAC stands for
(a) Genetic Ethical Approval Committee
(b) Genetic Engineering Active Commission
(c) Genetic Engineering Approval Committee
(d) Genetic Ethical Active Commission
- (ix) _____ includes rules of conduct that may be used to regulate our activities concerning the biological world
(a) Bioethics (b) Biopiracy
(c) Biosafety (d) Biopatents
- (x) Bt toxin is produced by a bacterium called
(a) Bacillus thuringiensis (b) Bacillus anthracis
(c) Bacillus thermophilus (d) Bacillus subtilis

Group- B

2. (a) How does a researcher plan a working hypothesis? [(CO1) (Plan/IOCQ)]
(b) Determine the significance of literature review in a research problem. [(CO2)(Understand/LOCQ)]
(c) Give a brief description of the different strategies of determining sample design. [(CO1)(Analyze/IOCQ)]
4 + 4 + 4 = 12
3. (a) Discuss the significance of 'control groups' in an experimental research. [(CO1) (Analyze/IOCQ)]
(b) What do you mean by a 'confounded relationship'? [(CO1) (Remember/LOCQ)]
(c) Evaluate the differences between Disciplinary, Subject-matter and Problem solving research. [(CO1)(Evaluate /HOCQ)]
4 + 4 + 4 = 12

Group - C

4. (a) Give a critical assessment of the different types of measurement scales used in research work. [(CO2) (Criticize/HOCQ)]
(b) Analyze how you can validate a measurement by tests of practicality and reliability. [(CO2) (Analyze/IOCQ)]
(c) Discuss the major features of a good questionnaire. [(CO2)(Analyze/IOCQ)]
4 + 4 + 4 = 12

5. (a) How can you examine your hypothesis by measures of central tendency?
[[CO2) (Examine/HOCQ)]
- (b) What are the tools by which you can measure the relationship between bivariate and multivariate populations? [[CO2) (Understand/LOCQ)]
- (c) Mention the precautions needed to taken during report writing.
[[CO2)(Analyze/IOCQ)]

4 + 4 + 4 = 12

Group - D

6. (a) Discuss the Nuremberg Code in detail. [(CO3)(Remember/LOCQ)]
- (b) Will GM crops feed the world? Argue for or against by using suitable examples.
[(CO3) (Criticize/HOCQ)]
- (c) Illustrate by a suitable diagram the mode of action of suicide gene therapy.
[(CO3)(Analyze/IOCQ)]

4 + 4 + 4 = 12

7. (a) What are EDV's? Explain using examples how farmer's rights, breeder's rights and researcher's rights vary from each other. [(CO4) (Understanding/LOCQ)]
- (b) What is informed consent? Is informed consent necessary for Belmont principles and Nuremberg code? Justify your answer by giving appropriate examples. [(CO4) (Justify/IOCQ)]

(3 + 3) + (2 + 4) = 12

Group - E

8. (a) Distinguish between hazard and biohazard. [(CO4) (Compare/IOCQ)]
- (b) Differentiate between selective breeding and genetically modified crops. Which one is better? Justify your answer by giving suitable examples.
[(CO4) (Justify/IOCQ)]
- (c) Is GM crops a boon or bane while using them for humans and environments? Justify your answer by using suitable examples of each. [(CO4)(Justify/IOCQ)]

4 + (2 + 2) + 4 = 12

9. (a) Distinguish between the functioning of RDAC and RGCM.
[(CO4) (Distinguish/IOCQ)]
- (b) Discuss the steps for granting approval of GMO's in India.
[(CO4) (Remember/LOCQ)]
- (c) Plan a stepwise process to explain the approval process for recombinant biological products. [(CO4) (Plan/HOCQ)]

4 + 4 + 4 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	27%	52%	21%

Course Outcome (CO):

After completion of this course, the students should be able to:

- 1) Describe the different aspects of research, and research processes such as literature survey, hypothesis testing.
- 2) Describe the important aspects of research problem such as sources of error in measurement, Data collection Methods, Interpretation and report writing.
- 3) Understand the concept of IPR, and i.e., types of IPR and different types of patents and its laws to protect patents.
- 4) Understand and explain biosafety and bioethical regulations.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question

Department & Section	Submission Link
BT	https://classroom.google.com/c/NDIwMzczMTUxNzEw/a/NDc0MzgwMDkyMzA5/details