

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

**Time Allotted : 2½ hrs**

**Full Marks : 60**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and  
any 4 (four) from Group B to E, taking one from each group.*

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

**Group – A**

1. Answer any twelve:

**12 × 1 = 12**

*Choose the correct alternative for the following*

- (i) What is the major attribute of correlation analysis?  
(a) Association among variables (b) Difference among variables  
(c) Regression among variables (d) Variation among variables.
- (ii) 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.
- (iii) What are the core elements of a dissertation?  
(a) Introduction, Data collection, Data analysis, Conclusion  
(b) Summary, Literature review, Data collection, Conclusion, Bibliography  
(c) Research plan, Research data, analysis, References  
(d) Introduction, Literature review, Research Methodology, Results, Discussion, Conclusion.
- (iv) Research can be classified as  
(a) basic, applied and action research  
(b) quantitative and qualitative research  
(c) philosophical, historical, survey and experimental  
(d) all of the above.
- (v) In order to pursue the research, which of the following is primarily required?  
(a) Developing a research hypothesis  
(b) Formulating a research problem  
(c) Deciding about the data analysis method  
(d) Formulating a research hypothesis.
- (vi) How long is a patent valid in India?  
(a) 30 years (b) 20 years  
(c) 40 years (d) 60 years.

- (vii) IPR in India covers  
 (a) Patents (b) Copyrights  
 (c) Trade Marks (d) All of these.
- (viii) Which of the following identifies as a trademark?  
 (a) Name, symbol (b) Symbol, logo  
 (c) Logo, name (d) Name, symbol, logo.
- (ix) The virus used as vector in gene therapy include  
 (a) oncoretrovirus (b) adenovirus  
 (c) herpes virus (d) all of the above.
- (x) The following can be patented  
 (a) Machine (b) Process  
 (c) Composition of matter (d) All of the above

*Fill in the blanks with the correct word*

- (xi) IPR protects the use of information and ideas that are of \_\_\_\_\_.
- (xii) In a research problem, the hypothesis which is being tested is called a \_\_\_\_\_ hypothesis.
- (xiii) Independent variables that are not related to the purpose of the study, but may affect the dependent variable are termed as \_\_\_\_\_ variable.
- (xiv) \_\_\_\_\_ scale is simply a system of assigning number symbols to events in order to label them.
- (xv) \_\_\_\_\_ is a herbal medicinal plant that has been patented by India.

### **Group - B**

2. (a) Analyze the importance of literature review in formulating a problem. [[C01](Analyze/IOCQ)]  
 (b) Design a comprehensive layout of a project report. [[C02](Design/HOCQ)]  
 (c) Outline the various criteria of good research. [[C02](Outline/IOCQ)]  
**4 + 4 + 4 = 12**
3. (a) What do you mean by a research problem? [[C01](Understand/IOCQ)]  
 (b) How does one go about developing working hypotheses? [[C01](Design/HOCQ)]  
 (c) How do you determine the sample design in a research problem? Supplement your answer with a brief mention of some important sample designs. [[C01](Analyze/IOCQ)]  
**4 + 4 + 4 = 12**

### **Group - C**

4. (a) Give a comparative analysis between different measurement scales of research. [[C02] (Compare/IOCQ)]  
 (b) Discuss the sources of error in measurement during research work. [[C02](Analyze/IOCQ)]

- (c) Analyze the various criteria for sound measurement in research. [[CO2](Analyze/IOCQ)]  
**4 + 4 + 4 = 12**
5. (a) Explain with an example what do you mean by extraneous variable? [[CO2](Analyse/IOCQ)]
- (b) Comment on the importance of 'Experiment' and 'Control' groups in research. [[CO2](Remember/LOCQ)]
- (c) Discuss how the measures of central tendency help to evaluate research data. [[CO2](Examine/HOCQ)]  
**4 + 4 + 4 = 12**

### Group - D

6. (a) Distinguish between *in vivo* and *ex vivo* therapy. [[CO3](Remember/HOCQ)]
- (b) Is gene therapy ethical? Justify this statement [[CO4](Analyze/LOCQ)]
- (c) Summarise the main objectives of Hugo ethics committee on gene therapy research. [[CO2](Apply/IOCQ)]  
**4 + 4 + 4 = 12**
7. (a) What is meant by trade secrets ? How are trade secrets guarded? [[CO3](Analyse/IOCQ)]
- (b) Explain the three main postulates on convention of biological diversity. What is meant by TK? [[CO4](Remember/LOCQ)]
- (c) Using any one of the misuses show how TK can be misinterpreted. [[CO2](Apply/HOCQ)]  
**4 + 6 + 2 = 12**

### Group - E

8. (a) What is meant by genetic counselling? Why is genetic privacy important? [[CO3](Analyse/HOCQ)]
- (b) Explain Hydroxyurea's effect on Sickle cell disease/Anaemia. [[CO4] (Remember/LOCQ)]
- (c) Compare and contrast between the three types of cloning. [[CO2](Apply/IOCQ)]  
**(2 + 2) + 4 + 4 = 12**
9. (a) Describe the procedures involved in the approval of GMO's in India. [[CO3](Analyse/IOCQ)]
- (b) Discuss about the function of GEAC. [[CO4](Remember/LOCQ)]
- (c) Illustrate with the help of a diagram the approval process of recombinant products in India. [[CO2](Apply/HOCQ)]  
**4 + 6 + 2 = 12**

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Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	25	50	25

**Course Outcome (CO):**

After the completion of the course students will 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.*