

**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) Random sampling is helpful as it is _____.
(a) reasonably accurate (b) free from personal bias
(c) economical (d) all of the above.
 - (ii) _____ is a preferred sampling method for a population with finite size.
(a) Systematic sampling (b) Purposive sampling
(c) Cluster sampling (d) Area sampling.
 - (iii) All research process starts with
(a) hypothesis (b) observation
(c) experiments to test hypothesis (d) all of these.
 - (iv) Which of the following is non-probability sampling?
(a) Snowball (b) Cluster
(c) Random (d) Stratified.
 - (v) Which of the following cannot be exploited by assigning or by
licensing the rights to others?
(a) Patents (b) Designs
(c) Trademarks (d) all of the above.
 - (vi) In India, the literary work is protected until
(a) Lifetime of author
(b) 25 years after the death of author
(c) 40 years after the death of author
(d) 60 years after the death of author.

- (vii) What is the name of the procedure performed under sterile conditions to eliminate contamination in hopes to obtain a pure culture of one type of microorganism?
 (a) Sterilization technique (b) Disinfectant technique
 (c) Aseptic technique (d) Pathogen technique.
- (viii) Which of the following factors influences the effectiveness of an antimicrobial agent?
 (a) Composition of the microbial population
 (b) Concentration of the antimicrobial agent
 (c) Contact time
 (d) all of these.
- (ix) Which of the following is not one of the three essential elements for a patent to be granted for an invention?
 (a) Be a product (b) Be new to the public
 (c) Be capable of industrial application (d) Involve an inventive step.
- (x) Which one of the following actions is not a breach of copyright?
 (a) To import copied CDs
 (b) To make a copy of a CD and sell it
 (c) To borrow a CD from a friend and copy it to your laptop for your own private use
 (d) To purchase a CD and copy it to your laptop for your own private use.

Group - B

2. (a) How do you define a research problem? Distinguish between research method and research methodology.
 (b) What are the differences between disciplinary and subject-matter research? Discuss with examples.
 (c) Elaborate on the importance of literature review in designing a research problem.
(2 + 2) + 4 + 4 = 12
3. (a) What are the different ways of data collection in a research problem?
 (b) Describe the major components of a research thesis.
6 + 6 = 12

Group - C

4. (a) Illustrate the design of a research problem involving exploratory research studies.

- (b) Discuss the major types of formal experimental designs in research work.
6 + 6 = 12
5. (a) What are the sources of error in measurement?
 (b) What are the differences between questionnaire and schedule?
 (c) Elaborate on the importance of coding in data analysis.
4 + 4 + 4 = 12
- Group - D**
6. (a) Why has University of Utah failed to get patent for BRCA 1 and BRCA 2 gene testing?
 (b) Write about ethical aspects regarding cloning.
 (c) Discuss in detail about ethical issues raised by genetic testing.
4 + 4 + 4 = 12
7. (a) Distinguish the two types of patents.
 (b) What is provisional specification?
 (c) What are the advantages of provisional specification?
4 + 4 + 4 = 12

Group - E

8. (a) Distinguish between GMO organisms and LMO organisms with examples.
 (b) Describe with the help of a flowchart the general approval procedures for recombinant products in India.
 (c) What are the potential environmental hazards and human health risks due to the use of GMO's?
 (d) What are some common examples of GMO's used in agricultural crops?
3 + 3 + 3 + 3 = 12
9. (a) Describe three main reasons why genetics is ethically interesting.
 (b) Distinguish between genetic engineering and agricultural breeding.
 (c) "Biotechnology is impacting our lives". Explain the meaning of this statement by using suitable examples.
4 + 4 + 4 = 12