

- (b) How do up-gradation of technology & innovation help in economic development?

6 + 6 = 12

9. (a) What are the different ways of measuring market opportunities for startups?

- (b) Discuss the role played by universities and research institutes in entrepreneurship development.

6 + 6 = 12

**BIOENTREPRENEURSHIP, IPR & BIOETHICS
(BIOT 6102)**

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) Which of the following prevents transmission of disease in laboratory?
 (a) Biosafety (b) Biosecurity
 (c) Biohazard (d) Biofuel.
- (ii) Which is the nodal center for Indian biosafety framework
 (a) Department of Biotechnology
 (b) Department of Science and Technology
 (c) Indian Agricultural Research Institute
 (d) Ministry of Environment and Protection
- (iii) Nuremberg Code (1947) refers to
 (a) Voluntary and informed consent (b) Anti-war movement
 (c) Birth of monoclonal Ab (d) rDNA technology.
- (iv) To apply for a patent, an inventor must
 (a) file an application at a patent office which must comply with formal and technical requirements
 (b) draft the full specification of the patent they seek, which cannot be later amended
 (c) demonstrate that their invention works
 (d) state the date on which the invention was first "reduced to practice.
- (v) Declaration of Helsinki was formulated by
 (a) World Women's Association (b) WTO
 (c) World Medical Association (d) WWII allied forces.

- (vi) Intellectual Property Rights (IPR) protect the use of information and ideas that are of
 (a) Ethical value (b) Moral value
 (c) Social value (d) Commercial value.
- (vii) 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.
- (viii) Which of the following is (are) included in Geographical indications of Goods?
 (a) Handicraft (b) Foodstuff
 (c) Manufactured (d) All of the above.
- (ix) The patentability of biotechnological inventions is limited in which of the following ways?
 (a) Patents relating to human genes cannot be patented
 (b) Genetic sequences on their own cannot be patented
 (d) Inventions that cause suffering to humans or animals cannot be patented
 (d) Patents that relate to medical treatment cannot be patented.
- (x) A patent will be invalid for lack of novelty if
 (a) Products falling within the claim were sold to the public before the priority date
 (b) The process claimed was carried on commercially before the priority date
 (c) A description of the product (in the case of a product claim) was published before the priority date
 (d) A video describing how to make the product claimed was published on the internet prior to the priority date.

Group - B

2. (a) Discuss on different Environmental Ethical Principles.
 (b) What is the difference between Intrinsic and Instrumental Values?
 (c) Discuss about HUGO Ethics Committee Statement on Gene Therapy research along with its problems.

4 + 4 + 4 = 12

3. (a) What are the pros and cons of social and ethical issues involving genetic engineering?

- (b) What is carrier testing and pre-natal diagnosis?
 (c) Using Huntington's disease as a case study discuss whether it is ethically correct to carryout test (i.e., to identify people who have Huntington's Disease).

4 + 4 + 4 = 12**Group - C**

4. (a) What are three main ways in which genes can be delivered?
 (b) Describe the setback of gene therapy using 18-year old Jesse Gelsinger along with its ethical issues. Write on Negative and Positive Eugenics.
 (c) What are the positive and negative aspects of genetically modified foods.
5. (a) Why a patent publication is done and describe its importance.
 (b) Describe how a patent publication is examined.
 (c) Discuss the difference between pre-grant and post-grant opposition during the process of filing a patent.

2 + (3 + 2) + 5 = 12**(2 + 2) + 4 + 4 = 12****Group - D**

6. (a) What are the ICMR guidelines for an informed consent?
 (b) Describe the glasshouse containment conditions for plant experiments.
 (c) Write a brief note on the Belmont Report.

4 + 4 + 4 = 12

7. (a) Discuss the containment facilities while carrying out experiments involving recombinant organisms.
 (b) What is the role of Genetic Engineering Approval Committee (GEAC) in Genetics research?

6 + 6 = 12**Group - E**

8. (a) What should be the role of government in promoting entrepreneurship?