U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

May 2024 Semester End Main Examinations

Programme: B.E. **Semester: VIII**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 19BT8HSBEB **Max Marks: 100**
Course: Bioethics and Biosafety

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

				CO	PO	Marks
			UNIT -I			
1	a)	In 2002, a joint venture between Monsanto and Mahyco introduced a GM crop in India that could resist bollworms. Identify and explain the GM crop. Highlight the major positive and negative impacts it has caused till 2016 in our country.		***CO*** 2	***PO 1,6***	**10**
	b)	How can GE ensure environmental sustainability as well as increase in food production when pressure on environmental resources like land and water is growing?		***CO*** 2	***PO 1,6***	**10**
			UNIT -II			
2	a)	List out the ethical, legal, and social issues of Biotechnology. State your view on an ELSI issue, and develop a logical argument to support your view		***CO*** 4	***PO 8***	**10**
	b)	Technology greatly affects individuals' and countries' productivity, wealth, health, and lifestyle. Due to the rapid growth of technologies and poor infrastructure in developing countries, they feel they are far behind developed countries. Technology transfer has become a great issue of concern for researchers, companies, and policymakers. Examine in detail technology, transfer process, channels, challenges, and barriers in developing countries.		***CO*** 2	***PO 1,6***	**10**
			UNIT -III			
3	a)	What is biopiracy? Give an account of any three cases of biopiracy of traditional knowledge from India.		***CO*** 3	***PO 2***	**10**
	b)	What are the potential benefits of stem cell research? Apprise the risks of stem cell therapy.		***CO*** 4	***PO 8***	**05**
	c)	What were some of the ethical, legal, and social implications addressed by the Human Genome Project? What will the next 50 years of medical science look like?		***CO 4***	***PO 8***	**05**
			OR			

	4	a)	The commercial application of genetically modified (GM) crops has been one of the major developments of science in the past two decades. Its large-scale proliferation has been driven by lower pesticide costs, higher yields, and enhanced nutritional values. The lack of tangible research, however, has brought forth several ethical concerns over the ultimate contribution of this technology. Explore the potential benefits and risks associated with GM crops while exploring the various ethical concerns ranging from environmental and economic impacts to consumption of GM crops.	***CO*** 3	***PO 2***	**10**
		b)	What are the ethical issues surrounding gene therapy?	***CO*** 4	***PO 8***	**05**
		c)	What are the ethical issues associated with the creation of artificial cells?	***CO 4***	***PO 8***	**05**
			UNIT-IV			
	5	a)	Distinguish initial and comprehensive risk assessment. You are provided with *Mycobacterium tuberculosis.* Do the initial and comprehensive risk assessment and place it under the suitable NIH research category.	***CO*** 2	***PO 1,6***	**10**
		b)	How is safety protected if one chooses to take part in a clinical trial?	***CO*** 2	***PO 1,6***	**05**
		c)	Enumerate the safety assessment of GM foods.	***CO 4***	***PO 8***	**05**
			OR			
	6	a)	What is biosafety? What are the different facilities and laboratory practices for the Biosafety levels 1, 2, 3 and 4?	***CO*** 2	***PO 1,6***	**10**
		b)	What are WMD? List out the different microbial strains and their products that can function as biological weapons.	***CO*** 2	***PO 1,6***	**05**
		c)	Why is there so much attention on genome editing with CRISPR/Cas9?	***CO 4***	***PO 8***	**05**
			UNIT-V			
	7	a)	What is the "Cartagena Protocol on Biosafety"? Name the important regulatory bodies responsible for framing and implementing Biosafety regulations in India.	***CO*** 2	***PO 1,6***	**10**
		b)	A lot of foods like Energy drinks, Nutraceuticals, Food supplements, Functional foods, etc. are coming on the market every day. Who is the regulatory authority for these products in India and what is being done to ensure the quality and safety standards of these products?	***CO*** 4	***PO 8***	**05**
		c)	What do you understand by "containment" in biosafety? What are the different methods for gene containment in plant biotechnology?	***CO 2***	***PO 1,6***	**05**

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