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

Autonomous Institute Affiliated to VTU

July 2023 Semester End Main Examinations

Programme: B.E.

Branch: Biotechnology

Course Code 19BT8HSBEB

Course: Bioethics and Biosafety

Semester: VIII

Duration: 3 hrs.

Max Marks: 100

Date: 04.07.2023

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

			UNIT - I			CO	PO	Marks
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.	1	a)	In 2002, a joint venture between Monsanto and Mahyco introduced a GM crop in India which could resist bollworms. Identify and explain the GM crop. Highlight the major positive and negative impacts it has caused till now in our country.			CO1	PO8	10
		b)	Introduction and commercialization of a transgenic crop intended for human consumption must be approved after nationwide consultation. Justify with a suitable case study in context to India.			CO1	PO8	05
		c)	How can GE ensure environmental sustainability as well as increase food production when pressure on environmental resources like land and water is growing?			CO2	PO7 PO8	05
			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			CO3	PO6 PO8	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.			CO1	PO8	10
			UNIT - III					
	3	a)	What is biopiracy? Give an account on any three cases of biopiracy of traditional knowledge from India.			CO2	PO8	10
		b)	What are the potential benefits of stem cell research? Appraise the risks of stem cell therapy.			CO4	PO8	05
		c)	What were the ethical, legal, and social implications addressed by the Human Genome Project? What will the next 50 years of medical science look like?			CO4	PO8	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. 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 the GM crops.	<i>CO2</i>	<i>PO7 PO8</i>	10
	b)	What are the ethical issues surrounding gene therapy?	<i>CO4</i>	<i>PO7 PO8</i>	05
	c)	What are the ethical issues associated with creation of artificial cells?	<i>CO4</i>	<i>PO7 PO8</i>	05
	UNIT - IV				
5	a)	What are transgenic foods? Introduction and commercialization of a transgenic crops is very challenging in countries like India. Discuss the major issues raised in the society and scientific community about transgenic foods.	<i>CO4</i>	<i>PO8</i>	10
	b)	How is safety protected if one chooses to take part in a clinical trial?	<i>CO4</i>	<i>PO8</i>	05
	c)	Enumerate the safety assessment of GM foods.	<i>CO4</i>	<i>PO8</i>	05
	OR				
6	a)	What is biosafety? What are the different facilities and laboratory practices for the Biosafety levels 1, 2, 3 and 4?	<i>CO4</i>	<i>PO8</i>	10
	b)	What are WMD? List out the different microbial strains and their products that can function as biological weapons.	<i>CO4</i>	<i>PO6 PO8</i>	05
	c)	Why is there so much attention on genome editing using CRISPR/Cas9?	<i>CO2</i>	<i>PO6 PO8</i>	05
	UNIT - V				
7	a)	What is “Cartagena Protocol”? Name the important regulatory bodies responsible for framing and implementing Biosafety regulations in India.	<i>CO2</i>	<i>PO8</i>	10
	b)	Lot of foods like Energy drinks, Nutraceuticals, Food supplements, Functional foods etc. are coming in the market every day. Who is the regulatory authority for these products and what is being done to ensure the quality and safety standards of these products?	<i>CO2</i>	<i>PO8</i>	05
	c)	What do you understand by “containment” in biosafety? What are the different methods for gene containment in plant biotechnology?	<i>CO2</i>	<i>PO8</i>	05
