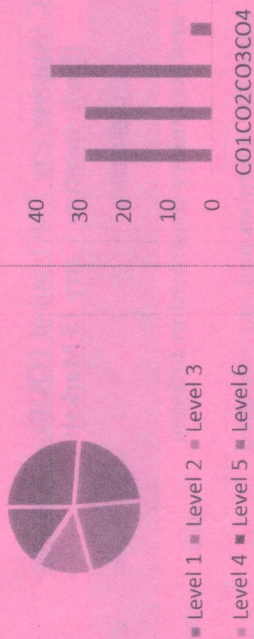


Course Outcomes	CO1	Evaluate the potential of biodegradation of organic pollutants, taking microbial and physical/chemical environments, as well as the chemical structure of the compound itself, into consideration
	CO2	Explain the phenomenon of phytoremediation for the decontamination of soil and water, wetlands as treatment processes, biofilms/biofilters for vapor-phase wastes, and composting
	CO3	Evaluate environmental quality, monitoring, and remediation of contaminated environments
	CO4	Understand the use of biosensors in environmental analysis, environmental engineering.

GRAPHICAL REPRESENTATION

Chart Title

Course outcome wise marks distribution



 ARKA JAIN University Jharkhand				[07-05-2025] END SEM EXAMINATION School of Health & Allied Sciences	
Program		B.Sc Biotechnology			
Subject Name		Environmental Biotechnology		Session	Even, 2024,2025
Semester		VI		Year	May, 2025
Time: 3 Hour Max. Marks : 60		• Start writing from 2nd page onwards; <u>don't Write on the 1st Page Backside</u> • Answer all Questions of Section A (Compulsory) • Answer Any Four out of Six of Section B • Answer Any <u>Two</u> out of Four of Section C • Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u>			
Knowledge Level (KL)		K1 : Remembering	K3 : Applying	K5 : Evaluating	
		K2 : Understanding	K4 : Analysing	K6 : Creating	

Section A (Each question Carry 01 Marks from Q1-i to x) – 10 Marks					
Q. N	QUESTIONS	Marks	COs	KL	
1					
i	Oil spills have been considered as a major threat to world environment, especially a. Marine ecosystem b. Terrestrial ecosystem c. Land ecosystem d. Vertebrate	01	CO1	KL2	
ii	Which of the following is not an organic pollutant? a. Insecticides b. Dioxins c. Polychlorinated biphenyls d. Oxygen	01	CO2	KL3	
iii	The use of biotechnology and microorganism to breakdown hazardous waste into relatively harmless components is termed as a. Phytoremediation b. Bioremediation c. Reduction process d. Waste management	01	CO1	KL3	
iv	Which of the following is not a reason behind air pollution? a. Industrialization	01	CO3	KL5	

v	b. Vehicular exhaustion c. Deforestation d. Afforestation	01	CO4	KL1
vi	The bioremediation process involving the usage of plants to degrade pollutants is a. Composting b. Biopile c. Phytoremediation d. Land farming	01	CO2	KL3
vii	Which phytoremediation technique uses plant roots to take up contaminated groundwater or surface water? a. Rhizofiltration b. Phytodegradation c. Phytostabilization d. Phytovolatilization	01	CO2	KL2
viii	Rhizosphere biodegradation depends on relationships between green plants and _____. a. microorganisms b. algae c. people d. animals	01	CO3	KL4
ix	A process using microbes to convert toxic industrial wastes to less toxic or non-toxic compounds is a. Precipitation b. Complement fixation c. Bioconversion d. Bioremediation	01	CO3	KL4
x	Activated sludge process usesto remove organic waste a. odour b. chemicals c. microbes d. none of the above	01	CO4	KL4
	Which contaminants among the following leads to environment pollution? a. CO2 b. Heavy metals and explosive c. Fertilizer d. Methane gas	01	CO4	KL4

Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 5 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
2	Do you feel that Biotechnology can solve the problem of Environmental pollution? Discuss.	05	CO1	KL4
3	Discuss about degradation of cellulose and hemicellulose using microbial sources.	05	CO2	KL1
4	What are different chemical reaction/mechanism by which microbes can degrade pesticides?	05	CO3	KL2
5	Discuss the role of Bio fertilizer. What is its importance for the environment?	05	CO2	KL3
6	GMO are harmful or beneficial to the environment? Discuss your views.	05	CO3	KL4
7	Differentiate between Ex-situ and In-situ Bioremediation.	05	CO4	KL1
Section C (Answer any TWO out of FOUR) – 30 Marks (Each question Carry 15 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	Discuss primary and secondary treatment in Effluent treatment plant.	15	CO3	KL1
9	What are lignin, name the microbes and enzyme used for lignin degradation? What are the factors which affect lignin degradation?	15	CO2	KL2
10	What is Bioleaching? Discuss its types. What are the factors which affect Bioleaching?	15	CO3	KL3
11	What can be different regional, local and global environment issue you feel? How these are or can be fixed using environment biotechnology applications?	15	CO1	KL6

CO1	Understand the principle and technical advances behind the in vitro culture of plant cells and DNA techniques
CO2	Able to understand the applications of plant transformation for improving the productivity
CO3	Understand the use of antisense technologies for improvement of crop plants
CO4	To grow soil less plant (Plant tissue culture)

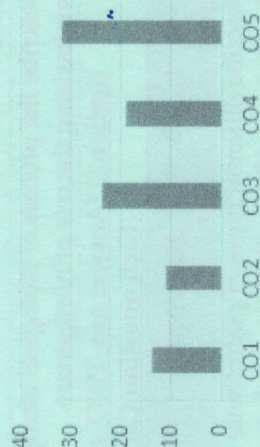
GRAPHICAL REPRESENTATION

Bloom's Level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution



 		[09-05-2025] END SEM EXAMINATION School of Health & Allied Sciences	
Program	B.Sc Biotechnology	Session	Even, 2024-2025
Subject Name	Plant Biotechnology	Year	May, 2025
Semester	VI		
Time: 3 Hour Max. Marks : 60	- Start writing from 2nd page onwards; <u>don't</u> Write on the 1st Page <u>Backside</u> - Answer all Questions of Section A (Compulsory) - Answer Any Four out of Six of Section B - Answer Any Two out of Four of Section C - Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u>		
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

Section A (Each question Carry 01 Marks from Q1-i to x) – 10 Marks

Q. N	QUESTIONS	Marks	COs	KL
i	Which type of culture involves growing plants from fertilized ovules? A. Callus culture B. Embryo culture C. Organ culture D. Protoplast culture	01	CO1	K3
ii	Which technique is used to produce haploid plants through male gametophyte? A. Ovary culture B. Gynogenesis C. Anther culture D. Endosperm culture	01	CO4	K2
iii	Which chemical is commonly used for chromosome doubling? A. Ethylene B. Colchicine C. Cytokinin D. Absciscic acid	01	CO1	K1
iv	Why are haploids important in plant breeding? A. Increase in plant height	01	CO3	K4

v	B. Production of double haploids C. Induce polyploidy D. Reduce flowering time Which plant part is used in microspore culture? A. Ovule B. Root C. Pollen grain D. Shoot apex	01	CO1, CO2	K2
vi	Somaclonal variation occurs during: A. In vitro culture B. Natural pollination C. Seed germination D. Tissue fixation	01	CO4	K1
vii	Artificial seeds are made using: A. Live pollens B. Somatic embryos C. Floral buds D. Zygotic seeds	01	CO3	K4
viii	Which bacterial gene is commonly used for herbicide tolerance in plants? A. Bt gene B. Bar gene C. Nif gene D. Nod gene	01	CO2	K2
ix	Transgenic plants can be engineered to delay fruit ripening using: A. Antisense RNA technology B. Protoplast fusion C. Somaclonal variation D. Callus culture	01	CO2	K6
x	Which of the following is not a type of plant tissue culture? A. Seed culture B. Axenic culture C. Callus culture D. Protoplast culture	01	CO4	K3

Section B (Answer any FOUR out of SIX) - 20 Marks
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Describe organogenesis and embryogenesis	05	CO1, CO3	K2, K6
3	Describe cryopreservation and write its significance in plant tissue culture.	05	CO1, CO2	K1, K5
4	What is gynogenesis? List the factors affecting gynogenic haploid production.	05	CO1	K1
5	What is somaclonal variation? Explain its basis and two major applications in crop improvement	05	CO2, CO4	K3
6	Discuss cytoplasmic male sterility and synthetic seeds	05	CO1	K2
7	Describe the process of biological nitrogen fixation, emphasizing the role of nitrogenase.	05	CO2	K4

Section C (Answer any TWO out of FOUR) - 30 Marks
(Each question Carry 15 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Describe different types of plant tissue cultures and also their specific applications in plant biotechnology.	15	CO1	K1, K5
9	Describe Plant Growth Promoting Bacteria (PGPB) and its mechanism that enhance plant growth. Write their roles in nitrogen fixation, root nodulation, and the biological control of plant pathogens.	15	CO2	K2, K4
10	Discuss micropropagation, write its different stages (with diagram) and also writes its advantages and disadvantages.	15	CO4	K1, K3
11	Describe the significance and process of haploid production in plant breeding. How can both androgenic and gynogenic methods be used to obtain haploids?	15	CO3	K2, K6