29/4/23 (22)

JGI ARKA JAIN University Jharkhand — NAAC GRADE A ACCREDITED UNIVERSITY			END SEM EXAMINATION School of Health & Allied Science
Program	Bachelor of Science (Biotechnology)		
Subject Name	Plant Biotechnology	Semester	VI
		Year	April 2024
Time: 3 Hour Max. Marks : 60	• Start writing from 2nd page onwards; don't Write on the 1st Page Backside • 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 Unfair Means and will Result in the Cancellation of the Papers.		

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

Q. No. 1	QUESTIONS	Marks	COs
i	Synthetic seeds are produced by the encapsulation of somatic embryos with_____. a) Sodium acetate b) Sodium nitrate c) Sodium chloride d) Sodium alginate	01	CO2
ii	Which of the following growth hormones produces apical dominance? a) Ethylene b) Cytokinin c) Auxin d) Gibberellin	01	CO1
iii	Cybrids are produced by a) The nucleus of one species but cytoplasm from both the parent species b) The fusion of two same nuclei from the same species c) The fusion of two different nuclei from different species d) None of the above	01	CO2
iv	Which of the following mediums is composed of chemically defined compounds? a) Natural media b) Artificial media c) Synthetic media d) None of the above	01	CO2

v	Which of the following chemicals are most widely used for protoplast fusion? a) Mannitol b) Polyethylene glycol c) Sorbitol d) Mannol	01	CO1
Vi	Which of the following plant cells shows totipotency? a) Cork cells b) Meristem c) Sieve tube d) Xylem vessels	01	CO1
vii	What is Callus? a) Tissues that grow to form an embryoid b) An unorganised actively dividing the mass of cells maintained in a culture c) An insoluble carbohydrate d) A tissue that grows from an embryo	01	CO2
viii	Totipotency refers to _____. a) Development of fruits from flowers in a culture b) Development of an organ from a cell in a culture medium c) Flowering in a culture medium d) All of the above	01	CO1
ix	What is Dimethyl sulfoxide used for? a) A gelling agent b) Cryoprotectant c) Chelating agent d) An Alkylating agent	01	CO3
x	The pair of hormones required for a callus to differentiate are_____. a) Ethylene and Auxin b) Auxin and Cytokinin c) Auxin and Abscisic acid d) Cytokinin and gibberellin	01	CO3

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

Q. No.	QUESTIONS	Marks	COs
2	What are different applications of plant tissue culture methods?	05	CO1
3	Define Organogenesis, Give different modes of organogenesis	05	CO1
4	Explain with the help of diagram about the process of callus induction using explant.	05	CO2
5	Explain the terms: a) Embryo Culture b)Embryo Rescue	05	CO3
6	What are pollen and anther culture? Write application of Haploid culture.	05	CO3
7	Define the terms: Explant, callus, differentiation, dedifferentiation and totipotency.	05	CO1

Section C (Answer any Two out of Four) – 30 Marks-
(Each question Carry 15 Marks)

Q. No.	QUESTIONS	Marks	COs
8	What is Protoplast culture? Explain and draw the process of Protoplast isolation and Protoplast culture.	15	CO1
9	What is meristematic shoot culture? Discuss the process and advantages of this technique?	15	CO2
10	What is somatic hybridization? Discuss the process and applications of somatic hybridisation.	15	CO3
11	Discuss role of Auxins and Cytokinin as plant growth regulators in the process of plant tissue culture.	15	CO1

ARKA JAIN University, Jharkhand — NAAC GRADE A ACCREDITED UNIVERSITY			END SEM EXAMINATION School of Health and Allied Science
Program	Bachelor of Science (Biotechnology)		
Subject Name	Bio Analytical tools	Semester	VI
		Year	April 2024
Time: 3 Hour Max. Marks : 60	• Start writing from 2nd page onwards; don't Write on the 1st Page Backside • 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 Unfair Means and will Result in the Cancellation of the Papers.		

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

Q. No. 1	QUESTIONS	Marks	COs
i	It is used to determine the presence of a particular substance in a sample and then to quantify the present substance a) Spectroscopy b) Microscopy c) Chromatography d) Photograph	01	CO1
ii	Which of the following is a technique for the determination of the three-dimensional structure of a protein? a) Gas chromatography b) Mass spectroscopy c) Radiotherapy d) NMR spectroscopy	01	CO1
iii	Imaging is based upon secondary and scattered electrons in a) Florescence microscope b) Phase contrast microscope c) SEM d) Compound Microscope	01	CO1
iv	These are commonly used in laboratories to measure the concentration of various samples on the basis of total light absorbed by the sample a) Spectrophotometers b) P^H meters	01	CO4

	c) Electrophoresis unit d) None of the above		
v	Globar lamp is used in a) IR spectroscopy b) UV-Vis spectroscopy c) Emission spectroscopy d) None of the above	01	CO4
vi	Which column are best in chromatography a) Longer column b) Shorter column c) Both have same effect d) None of these can be used	01	CO4
vii	In Thin layer chromatography, the stationary phase is made of _____ and the mobile phase is made of _____ a) Solid, liquid b) Liquid, liquid c) Liquid, gas d) Solid, gas	01	CO1
viii	HPLC is an abbreviation for? a) High Profit Liquid Chromatography b) High Pressure Liquid Chromatography c) Higher Performance Low Chromatography d) Higher Profit Low Chromatography	01	CO1
ix	For what purpose cell fractionation is required a) Individual study of cells b) Study of Biochemical function c) Understanding of Molecular basis of disease d) All of the above	01	CO1
x	Coomassie blue is a) Loading dye for DNA b) Staining dye for Protein c) Loading dye for protein d) Staining dye for DNA	01	CO2

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

Q. No.	QUESTIONS	Marks	COs
2	Draw a well labelled diagram of compound microscope.	05	CO1
3	Explain Functioning of TEM.	05	CO1
4	Discuss the Principle and application of gas chromatography.	05	CO4
5	Discuss the principle and working of IR spectroscopy.	05	CO3
6	Discuss process of Agarose Gel electrophoresis.	05	CO2
7	Discuss application of Nanotechnology.	05	CO1

Section C (Answer any Two out of Four) – 30 Marks-
(Each question Carry 15 Marks)

Q. No.	QUESTIONS	Marks	COs
8	Explain Principle and Functioning of Scanning Electron Microscope	15	CO1
9	Explain SDS PAGE. For what purpose it can be used? How it is different from Native PAGE?	15	CO2
10	Discuss instrumentation, working and application of NMR.	15	CO1
11	Discuss any three types of Biosensors and their application	15	CO1

11/5/24 M (20)

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NAAC GRADE A
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END SEM EXAMINATION
School of Health & Allied Sciences

Program	Bachelor of Science (Biotechnology)		
Subject Name	Genomics & Proteomics	Semester	VI
		Year	April 2024
Time: 3 Hour Max. Marks : 60	• Start writing from 2nd page onwards; don't Write on the 1st Page Backside • 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 Unfair Means and will Result in the Cancellation of the Papers.		

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

Q. No. 1	QUESTIONS	Marks	COs
i	In SDS-PAGE, protein sample is first treated with detergent sodium dodecyl sulfate (SDS), in order to a) Make the protein become negatively charged b) Make the protein become positively charged c) Renature protein d) Adjust the pH	01	CO2
ii	Genome is a) Haploid set of chromosome of multicellular organism b) Diploid set of chromosome of multicellular organism c) Total no. of genes in a single chromosomes d) None of these	01	CO1
iii	Which of the following are known as helix breakers? a) Proline and glycine b) Isoleucine and leucine c) Valine d) Threonine	01	CO2
iv	This genome browser acts as single point of access to annotated genome for a) Mainly Vertebrates b) Ensemble c) VISTA d) UCSE	01	CO1
v	Dideoxy DNA sequencing method is also called a) Sanger Method b) Maxam Gilbert Method c) Clone Contig d) Shot gun method	01	CO3

vi	Dye used for the visualization of protein in PAGE is/are a) Coomassie brilliant blue b) Silver nitrate c) Both (a) & (b) d) EtBr	01	CO5
vii	UCSE has a) Gene and gene prediction track b) EST track c) Phenotype and literature track d) All of above	01	CO1
viii	This collection of databases generally used to align and compare your sequences to those of multiple other species (comparative genomics) a) UCSC b) ENSEMBLE c) VISTA d) Eco Cyc	01	CO1
ix	Database specific for drosophila is a) SGD b) EcoCYC c) Flybase d) VISTA	01	CO1
x	EST means a) E. coli Sequence Type b) Expressed Sequenced Tags c) Ensembled Structured Tags d) E. coli Structured Tag	01	CO4

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

Q. No.	QUESTIONS	Marks	COs
2	Write short notes on a) 2D-PAGE b) VISTA	05	CO2
3	What is stacking gel? Describe the use of stacking gel.	05	CO5
4	Give a brief note on the databases and tools used for Genome studies	05	CO1
5	Explain shot gun approach of DNA sequencing method	05	CO5
6	Describe different physical interaction determine the properties of protein	05	CO2
7	What is gene annotation? Discuss the gene prediction using homology search.	05	CO4

Section C (Answer any Two out of Four) – 30 Marks-
(Each question Carry 15 Marks)

Q. No.	QUESTIONS	Marks	COs
8	What is a model organism? Describe the genomic databases of model organisms.	15	CO2
9	Give the method, importance and identification of proteins using mass spectrometry.	15	CO5
10	Describe Sanger method of DNA sequencing.	15	CO3
11	Explain in detail about 2D gel electrophoresis techniques	15	CO5

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ARKA JAIN University
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NAAC GRADE A
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END SEM EXAMINATION
School of Health and Allied Science

Program	Bachelor of Science (Biotechnology)		
Subject Name	Environment Biotechnology	Semester	VI
		Year	April 2024
Time: 3 Hour Max. Marks : 60	• Start writing from 2nd page onwards; don't Write on the 1st Page Backside • 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 Unfair Means and will Result in the Cancellation of the Papers.		

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

Q. No.	QUESTIONS	Marks	COs
i	Which phytoremediation technique uses plant roots to take up contaminated groundwater or surface water? a) Rhizofiltration b) Phytodegradation c) Phytostabilization d) Phytovolatilization	01	CO1
ii	Chinese Brake fern (Pteris vittata) is the hyper accumulator of a) Cadmium b) Arsenic c) Chromium d) Lead	01	CO1
iii	Which of the following Bacteria help in the leaching of Copper from its ore. a) Accidithiobaccillus Ferrooxidans b) Pdeudomonas puttida c) Deinococcus radiodurans d) Rhodopseudomonas capsulate	01	CO1
iv	Which among the following is a hydrocarbon degrading bacteria? a) Alcanivorax b) Oleisperia c) Marinobacter d) All the above	01	CO2

v	Which among the following is a genetically engineered microorganism used for degradation of petroleum product a) Pdeudomonas puttida b) Bacillus cereus c) Acetobactor d) None of the above	01	CO2
vi	Environment Biotechnology involves a) The use of microbes to clean up the environment b) Bioremediation c) The study of benefits and hazards associated with GMM d) All of these	01	CO2
vii	Oil spills are considered as the major threat to world environment, especially….. a) Marine Ecosystem b) Terrestrial Ecosystem c) Land Ecosystem d) Vertebrates	01	CO2
viii	This clean-up approach includes removal of groundwater or soil from its natural setting to permit for bioremediation a) Bio augmentation b) In situ bioremediation c) Ex situ bioremediation d) Phytoremediation	01	CO3
ix	Bioremediation is defined as a) Usage of microbes to create new organisms b) Usage of anaerobic bacteria to create new antibiotics c) Usage of microbes to destroy environmental pollutants d) Usage of aerobic bacteria to create new vaccines	01	CO3
x	Ananda Chakraborty received the first U.S. patent for a GM entity. The entity was a) The GloFish b) A transgenic mouse expressing the growth hormone gene c) Cloned E.Coli d) Pseudomonas engineered to degrade petroleum	01	CO3

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

Q. No.	QUESTIONS	Marks	COs
2	Write short notes on: a) Biomarkers b) Biofuel	05	CO1
3	What is Environment Biotechnology? How can we use it to prevent our Environment?	05	CO2
4	What do you mean by Biofuels? What is their advantage in controlling pollution in the environment?	05	CO2
5	Name the microorganism used for the biodegradation of cellulose and Lignocellulose.	05	CO3
6	What is Phytoremediation? Explain the Phytoextraction and Phytovolatilization techniques for treatment of polluted soil	05	CO3
7	What are symbiotic and asymbiotic Nitrogen fixing bacteria? Explain the process of Nitrogen Fixation.	05	CO4

Section C (Answer any Two out of Four) – 30 Marks-
(Each question Carry 15 Marks)

Q. No.	QUESTIONS	Marks	COs
8	What is Bioremediation? Explain the bioremediation of lignocellulose and PAH?	15	CO2
9	Name the major heavy metal pollutant in soil. Explain the process of remediation of heavy metal from polluted soil.	15	CO2
10	What are Biofertilizers? Describe different types of Biofertilizers? Write the advantages of Biofertilizers.	15	CO3
11	What are GMO? Explain the significance of genetically modified organisms in environment, with example.	15	CO3