MAHATMA GANDHI UNIVERSITY, KOTTAYAM

FOURTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code: **MG4DSCBOT200** Course Title: **ARCHEGONIATES**

Time: 1.5 Hrs **Maximum Marks: 50**

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part **A**: **Short answers**
Answer 10 questions
Each question carries 1 mark

	Questions	Taxonomy	CO
1	Name the first cell of sporophytic generation.	Remember	1
2	How do the sex organs in archegoniates differ from that of algae?	Understand	1
3	Name the two types of rhizoids in *Riccia.*	Remember	3
4	What are pseudoelators?	Understand	3
5	Name the conducting tissues found in the central axis of *Pogonatum.*	Remember	3
6	Is *Psilotum* homosporous or heterosporous?	Remember	3
7	What is ligule and where is it located?	Understand	3
8	Which pteridophyte is widely used as a biofertilizer?	Remember	4
9	Why do gymnosperms fail to produce fruits?	Understand	1
10	Name the three classes of gymnosperms proposed by Sporne.	Remember	2
11	What is the symbiotic relationship found in *Pinus* roots?	Remember	3
12	List out two common ornamental gymnosperms.	Remember	4

Part **B**:
Short Essay Type Questions
Answer 6 Questions
Each question carries 5 marks

13	Discuss the challenges faced by early land plants for the transition from water to land and the adaptations they evolved.	Understand	1
14	Explain the unique features of sporophyte of *Anthoceros*	Understand	3
15	Write a short note on the synangium of *Psilotum*.	Understand	3
16	Analyze how heterospory in *Selaginella* provides an evolutionary advantage in terrestrial environments.	Analyze	3
17	Discuss different stelar types in pteridophytes.	Understand	3
18	Describe the xerophytic features of *Cycas* leaflet.	Understand	3
19	Comment on structure of *Pinus* ovule.	Understand	3
20	Summarize the economic importance of gymnosperms.	Understand	4

Part **C**:

Essay Type Questions

Answer any one question

Question carries 10 marks

21	Assess the ecological and economic importance of pteridophytes.	Evaluate	4
22	Write an essay on general characteristics of gymnosperms.	Understand	1

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) FOURTH
SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code: **MG4DSCBOT201** Course Title: **Plant Anatomy and Reproductive Botany**

Time: 1.5 Hrs Maximum Marks: 50

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Part A: Short answers

Answer 10 questions
Each question carries 1 mark

	Question	Taxonomy	CO
1	Name a stain used in light microscopy.	[K]	1
2	Mention the role of a fixative in specimen preparation for microscopy.	[U]	1
3	What are plasmodesmata?	[K]	2
4	What are bordered pits?	[K]	2
5	Mention any two advantages of bioethanol over conventional fossil fuels.	[U]	2
6	Write any two conversion techniques used to convert cellulose into bioethanol.	[K]	2
7	Define dendrochronology.	[K]	3
8	What is heartwood?	[K]	4
9	What is meant by grain in wood?	[K]	5
10	Define polyembryony.	[K]	6
11	What is double fertilization?	[K]	6
12	Distinguish between cleistogamy and geitnogamy.	[U]	6

Part B: Short Essay Type Questions

Answer 6 questions
Each question carries 5 marks

13	What are secretory tissues? Explain any two with suitable examples.	[U]	1
14	Give a detailed account of the ultrastructure of the plant cell wall.	[U]	2
15	Discuss the scope of cellulose as a potential energy source for the future.	[U]	2
16	What is reaction wood? Compare tension wood and compression wood.	[U]	4
17	Describe the anatomical features used in the identification of commercial wood.	[U]	5
18	Explain in detail the applications of wood anatomy.	[U]	5
19	What is endosperm? Explain the different types of endosperm development.	[K]	6
20	Describe the internal structure of a dithecous anther.	[K]	6

Part C: Essay Type Questions

Answer any 1 question

Question carries 10 marks

21	Describe and illustrate the monosporic type of embryo sac development.	[U]	6
22	With a neat labelled diagram, explain the process of secondary thickening in a dicot stem.	[U]	3

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)
FOURTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code:MG4DSCBOT202 Course Title: INTRODUCTION TO FLOWERING PLANTS AND THEIR ECONOMIC IMPORTANCE

Time: 1.5 Hrs Maximum Marks: 50

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part A:
Short Answers
Answer 10 questions
Each question carries 1 mark

SL No	Question	Taxonomy	CO
1	What is an actinomorphic flower?	Remember	1
2	What is binomial nomenclature	Remember	2
3	Name a herbarium in India.	Remember	2
4	Name a medicinally important plant in Apocyanaceae.	Remember	3
5	What is meant by diadelphous stamen	Remember	3
6	Which is the characteristic fruit of Poaceae?	Understand	3
7	Name a tuber crop commonly used as staple food.	Understand	3
8	Name the branch of science links botany and anthropology?	Remember	4
9	Give the common name of little millet.	Remember	4
10	Which plant is known as “green gold of the Kani tribes”?.	Remember	4
11	Name a millet commonly used as staple food by tribal people.?	Remember	4
12	Who coined the term ethnobotany??	Remember	4

Part B:

Short Essay Type Questions
Answer 6 questions
Each question carries 5 marks

13	Categorize the flowers based on the position of ovary with respect to other floral parts?	Understand	1
14	Explain the importance and uses of herbarium in botanical studies.	Understand	3
15	Using Bentham and Hooker’s system of classification justify the systematic position of the family Malvaceae..	Apply	3
16	Give the name of any five economically important plants of the family Rubiaceae and their uses.	Understand	3
17	Give the binomial and uses of sugarcane.	Remember	3
18	Give the binomial and uses of Neem and Tulsi.	Remember	
19	Give a short account on Alpinia galanga highlighting its use by tribals and village folks.	Understand	4

20	What is the scope and significance of Ethnobotany	Understand	4

Part C:

Essay Type Questions

Answer any one question

Question carries 10 marks

21	Give an account on Bentham and Hooker's system of classification? Mention any five merits and demerits of this classification	Understand	2
22	Give an account on racemose inflorescence?.	Understand	1

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

FOURTH SEMESTER MGU-UGP (HONOURS) REGULAR EXAMINATION

Fourth Semester

Course Code**: MG4DSCEVS200** Course Title**: ENVIRONMENTAL POLLUTION AND MANAGEMENT**

(2024 ADMISSION ONWARDS)

Duration: 1.5 Hours **Maximum Marks: 50**

Remember (K), Understand (U), Analyse (An), Evaluate (E), Create (C), Interest (1), Appreciation (Ap), and Skill (S)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Short Answers

Answer 10 Questions. Each question carries 1 mark

	Taxonomy	CO
1. What is air pollution?	[K]	[1]
2. Define soil pollution.	[K]	[3]
3. Define aerosol?	[K]	[1]
4. What is ground water pollution?	[K]	[2]
5. What is radioactive pollution?	[K]	[5]
6. Give two examples of solid wastes that can pollute soil.	[K]	[3]
7. What are fertilizer residues?	[K]	[3]
8. Name any two hospital wastes that can contaminate soil.	[K]	[3]
9. Mention one source of radioactive soil pollution.	[K]	[3]
10. What is biopollutant?	[K]	[1]
11. Give one example of a pesticide that can cause soil pollution.	[K]	[1]
12. What is smog?	[K]	[1]

(10 x 1 =10)

Part B

Short essay type Questions

Answer 6 questions. Each question carries 5 marks

13. Explain the nature and types of air pollutants.	[U]	[1]
14. What are the effects of water pollution on environment?	[U]	[2]
15. Discuss the control measures of soil pollution.	[U]	[3]
16. Explain the role of fly ash as an air pollutant.	[U]	[1]
17. Describe the impact of biopollutants on health and the environment.	[U]	[1]
18. Describe general effects of noise pollution.	[U]	[4]
19. What are the types and sources of radioactivity?	[U]	[5]
20. Explain the control and protective measures of noise pollution.	[U]	[4]

(6 x 5 =30)

Part C

Essay Type Questions

Answer any one question. Questions carry 10 marks.

21. Describe radioactive pollution and explain its precautions and control measures. [U] [5]
22. Explain the various types and sources of water pollution. [U] [2]

(1 x 10 =10)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FOURTH SEMESTER EXAMINATION

(2024 ADMISSION ONWARDS)

Course Code: **MG4DSEBOT200** Course Title: **FOOD SCIENCE & QUALITY CONTROL**

Time: 2 Hrs Maximum Marks: 70

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part A: Short answers

Answer 10 questions

Each question carries 2 marks

Sl.No	Questions	Taxonomy	CO
1	Give any one source and function of Carbohydrates.	Remember	1
2	List any two examples of Probiotics.	Remember	1
3	What is the function of proteins?	Remember	1
4	List out any two common food adulterants.	Understand	2
5	Name the causative organism for botulism.	Remember	2
6	Name any two thickening agents.	Understand	4
7	Give any two examples of food additives.	Remember	1
8	What is food spoilage? Give one reason.	Understand	2
9	Name any two food preservation methods.	Remember	2
10	What are food preservatives? Give an example.	Remember	3
11	Expand FSSAI.	Remember	1
12	What do you mean by food sampling?	Understand	3

Part B: Short Essay Type Questions

Answer 8 questions

Each question carries 5 marks

13	Describe the dietary source and function of fibers.	Remember	1
14	What are fermented foods. Give some examples with its health benefits.	Remember	1
15	Explain the harmful effects of food adulteration.	Understand	2
16	Differentiate natural and artificial sweeteners with examples.	Apply	4
17	Comment on Causative organism, symptoms and control measures for mycotoxicosis.	Understand	2

18	Comment on the physical and chemical changes seen in food during spoilage.	Understand	2
19	Differentiate between the low and high temperature preservation of food.	Apply	3,4
20	Write short notes on any two food preservatives.	Understand	3
21	Comment on importance of quality control in food industry.	Understand	1,3
22	Write about HACCP and its principles.	Remember	1,3

Part C: Essay Type Questions

Answer any 1 question

Question carries 10 marks

23	Write an essay on various food additives you have studied.	Apply	4
24	Explain different types of food with suitable examples.	Understand	1

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

FOUTH SEMESTER MGU-UGP (HONOURS) REGULAR EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code: MG4DSEBOT201 Course Title: Horticulture and post-harvest technology

Time: 2 Hrs **Maximum Marks: 70**

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part A
Short answers answer **any ten** questions
Each question carries **2 mark**

Sl. No	Questions	Taxonomy	CO
1.	Name an organic component of soil?	[U]	[1]
2.	What is sodic soil?	[R]	[2]
3.	What is rockery?	[R]	[1]
4.	Define pruning.	[R]	[1]
5.	What is totipotency?	[U]	[2]
6.	Name any two branches of horticulture.	[U]	[1]
7.	What is a truck garden?	[R]	[1]
8.	Explain the process of low-pressure storage.	[U]	[4]
9.	Name any two chemical preservatives used in food industry.	[U]	[5]
10.	Expand FSSAI	[R]	[6]
11.	Mention any two roles of VFPCK.	[R]	[7]
12.	How waxing improves the shelf life of fruits and vegetables?	[U]	[3]

(10x2=20)

Part B
Short Essay Type Questions
Answer **any eight** Questions
Each question carries **5 marks**

13.	Describe the steps involved in estimation of pH of a soil.	[A]	[2]
14.	Explain various types of soils.	[U]	[2]
15.	Discuss the role of organic manures and synthetic manures in sustainable agriculture.	[A]	[2]

16.	Give a brief account on different type of gardens.	[R]	[1]
17.	Discuss the importance of landscape design in an institution.	[U]	[1]
18.	Differentiate between Budding and Grafting.	[U]	[2]
19.	Discuss the economic significance of cut flowers in the floriculture industry.	[U]	[1]
20.	Describe any two methods used to reduce postharvest losses in agricultural products.	[U]	[3]
21.	Discuss the scope and importance of horticulture.	[U]	[1]
22	Explain the importance and scope of the processing industry in relation to employment generation.	[A]	[7]

(8x5=40)

Part C

Essay Type Questions
Answer **any one** question
Each question carries **10 marks**

23.	Write an essay on different methods of propagation.	[R]	[2]
24.	Discuss the role of various export promotion agencies	[U]	[6]

(1x10=10)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

FOURTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code: **MG4DSEBOTA00** Course Title: **Applied Phycology and Mycology**

Time: 2 Hrs **Maximum Marks: 70**

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part **A**:
Short answers
Answer 10 questions
Each question carries 2 marks

	Questions	Taxonomy	CO
1	Comment on cell wall of algae	Remember	1
2	Define heterotrophic mode of nutrition	Remember	1
3	Write any two modern technologies in algal systematics	Understand	1
4	Mention the importance of algae in nutrient cycles?	Remember	1
5	Write down about the biotic associations of algae	Understand	2
6	Comment on the importance of algae in space research	Understand	2
7	What is unialgal culture	Remember	2
8	Write any four industrial applications of fungi	Understand	3
9	How fungus is associated with fermentation	Remember	3
10	Mention any two fungal interactions	Remember	4
11	What are mycotoxins? Cite an example	Understand	4
12	Write an example of two edible fungi	Understand	3

Part **B**:
Short Essay Type Questions
Answer 8 Questions
Each question carries 5 marks

13	Blue green algae paved the way to oxygenic environment. Justify	Understand	1
14	Write a short note on algal biomonitors	Understand	2
15	Briefly describe the extraction and conversion of microalgal lipids	Understand	2
16	What are algal biodiesels? Cite any two examples	Understand	2
17	List any 5 commercial products from algae	Remember	3

18	Comment on algal nutraceuticals with suitable examples	Understand	3
19	Write a short note on fungal cosmetics	Understand	4
20	Briefly describe about fungal interactions	Apply	4
21	Explain the role of fungi in biodegradation	Apply	4
22	Discuss the role of fungi in bioherbicide	Remember	4

Part **C**:
Essay Type Questions
Answer any one question
Question carries 10 marks

23	Write an essay on technological applications of algae.	Understand	1
24	Describe the role of fungi in agriculture and pharmaceuticals	Remember	4

QNSMARTI:H:QPCODE

Reg.No : .....

Name : .....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) REGULAR EXAMINATION MARCH 2026

FOURTH SEMESTER

Discipline Specific Elective Course (DSE): MG4DSEBOTA01

AGRIFOOD SCIENCE AND NANOTECHNOLOGY

(2024 ADMISSION ONWARDS)

Duration: 2 h **Maximum Marks: 70**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Short Answer

Answer any 10 questions.

Each question carries 2 marks

		Taxonomy	CO
1	Name any two major components of agrifood system.	Remember	1
2	Give one example of a food product derived from each of the following sources: a Forestry b. Aquaculture	Remember	1
3	Mention any two areas that highlight the scope of nanotechnology.	Remember	1
4	What are quantum dots? Mention any one application of quantum dots.	Remember	1
5	Give two ways how nanotechnology can improve the quality of food.	Understand	2
6	Explain the role of nanofilters in ensuring the safety of fruit juices	Understand	3
7	Classify the nanomaterials used in food packaging into organic and inorganic types with one example each.	Understand	2
8	State the need for regulations in the application of nanotechnology in food and agriculture.	Understand	3
9	Briefly explain the impact of nano-based products such as Nano Urea and Nano DAP on soil health and crop productivity.	Understand	3
10	Explain how nanotechnology enables precise dosage and targeted application of agricultural inputs.	Understand	4
11	Mention the practical uses of edible nanocoatings and nano-enabled urban agriculture in improving food quality and safety.	Understand	4
12	State the importance of preparing a report to evaluate the impact of nanotechnology applications on agrifood systems.	Understand	3

(2×10=20)

Part B

Short Essay
Answer any 8 questions.
Each question carries 5 marks.

13	Explain the role of nanotechnology in crop production and soil health monitoring.	Remember	1
14	Discuss how nanotechnology enhance food texture and its flavour.	Understand	2
15	Explain the use of portable nanosensor kits made of gold in maintaining food safety.	Understand	3
16	Elaborate how nanobarcodes are used in food quality control for tracking and tracing food products.	Understand	3
17	Discuss why green synthesis is preferred for producing silver nanoparticles and mention its key benefits.	Understand	4
18	Explain the benefits of nanomaterials in food packaging with special reference to oxygen scavenging packaging.	Understand	2
19	Explain the concept of smart packaging using RFID nanotags and mention its advantages in food quality monitoring.	Understand	3
20	Describe the role of government and research organizations such as CeNSE, IFFCO, IARI, and IIT Delhi in the development of nanotechnology for agrifood systems.	Remember	1
21	Outline the role of nanotechnology in modern agrifood systems, including AI-guided automation, nanosensors, edible nanocoatings, and nano-enabled urban agriculture.	Remember	1
22	Write an account of what you learned from a visit to a National or International Centre for Nanoscience regarding nanotechnology applications in agrifood systems.	Remember	1

(5×8=40)

Part 3

Essay
Answer any 1 questions.
Each question carries 10 marks.

23	Describe nano-fertilizers and nano-pesticides, highlighting their advantages over conventional fertilizers and pesticides.	Remember	1
24	Discuss the major challenges of applying nanotechnology in agriculture and allied fields, with reference to toxicity concerns, high cost, scalability issues, lack of awareness, and skill shortage.	Understand	3

(10×1=10)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FOURTH SEMESTER EXAMINATION

Discipline Specific Elective Course (DSE)

MG4DSEBOTA03: ELEMENTARY PRINCIPLES AND APPLICATIONS OF PLANT BIOTECHNOLOGY & INDUSTRIAL BOTANY

(2024 ADMISSION ONWARDS)

Time: 2 Hrs **Maximum Marks: 70**

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part A

One or two Sentences

Answer any ten questions Each question carries 2 marks

1.	What are cryoprotectants?	[K]	[2]
2.	Name any two disadvantages of transgenic plants.	[U]	[2]
3.	What is rDNA technology?	[K]	[2]
4.	Define proteomics.	[K]	[1]
5.	How would you summarize the types of molecular markers?	[U]	[4]
6.	Recall the use of biotechnology in environmental monitoring.	[K]	[3]
7.	Name any four plants used in biofuel production	[K]	[6]
8.	Why are biopolymers modified?	[A]	[6]
9.	What are gene banks?	[U]	[5]
10.	Enlist any two plants used in bioremediation.	[K]	[5]
11.	Short note on biostimulation.	[U]	[5]
12.	Comment on the importance of ginger house.	[U]	[5]

(2 × 10 = 20)

PART - B

Short answer

Answer any eight questions. Each question carries 5 marks

13. Elucidate the applications of somatic cell hybridization in plant improvement.	[K]	[1]
14. Describe the steps involved in cryopreservation.	[K]	[2]
15. Discuss the importance of transgenics in plant biotechnology.	[U]	[2]
16. What are the applications of biotechnology in waste management.	[A]	[3]
17. Summarize the significance of marker-assisted breeding in crop improvement citing an example.	[An]	[4]
18. What are the applications of natural dyes extracted from plant sources?	[A]	[6]
19. Explain with examples the different types of bioplastics.	[K]	[6]
20. How can resource management be optimized in bioremediation?	[A]	[5]
21. How can industrial botany be applied in the restoration of degraded habitats? Discuss with suitable examples.	[A]	[5]
22. Comment in detail the importance of biodiversity conservation for industrial applications	[An]	[5]

(5 × 8 = 40)

PART – C

Essay

Answer any one question. Each question carries 10 marks

23. What are essential oils? Explain in detail the process of extracting essential oils from plant sources.	[U]	[6]
24. Write an essay on the application of biotechnology in improving agriculture. Also discuss the ethical issues raised in this regard.	[A]	[3]

(10 × 1 = 10)

QNSMARTI:H:QPCODE

Reg.No : .....

Name : .....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FOURTH SEMESTER EXAMINATION

COURSE NATURE: DSE (SIGNATURE COURSE)

COURSE CODE: MG4DSEBOTA04

COURSE NAME: VALUE-ADDED PLANT PRODUCTS

(2024 ADMISSION ONWARDS)

Duration: :2 hours **Maximum Marks:70**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Short Answer Questions

Answer any **10** questions

Each question carries **2** marks

1. Define value addition. [K] / [CO1]
2. List any two plant parts commonly used for value addition, with examples [K] / [CO1]
3. Describe bioprospecting [U] / [CO1]
4. Explain vulcanization of rubber [U] / [CO2]
5. Define lyophilization [K] / [CO2]
6. Name the plant from which chocolate is obtained. What is fermentation in chocolate processing? [K] / [CO2]
7. Name any two plants commonly used in cosmetics [K] / [CO3]
8. Define aromatherapy [K] / [CO3]
9. List two advantages of fiber-based craft products. [K] / [CO3]
10. What is branding in plant-based enterprises? [K] / [CO4]

11. Expand FSSAI and AGMARK [U] / [CO4]

12. Name any two government initiatives supporting plant-based startups [K] / [CO4]

[2x10 = 20]

Part B

Short Essay Questions

Answer any **8** questions

Each question carries **5** marks

13. Explain the applications of value addition in food, healthcare, crafts, cosmetics, and bio-materials [U] / [CO1]

14. Discuss traditional and scientific processing techniques used in plant-based products [U] / [CO1]

15. Describe the pre-processing technique [U] / [CO1]

16. Explain various preservation techniques used in value-added plant products [U] / [CO2]

17. Describe the processing and preservation of tea [U] / [CO2]

18. Explain the extraction and formulation of essential oils and hydrosols. [U] / [CO3]

19. Write a note on perfumery plants [A] / [CO3]

20. Explain the cultural significance of eco-crafts in India [U] / [CO3]

21. Explain the role of standards and certification in commercialization of value-added plant products. [U] / [CO4]

22. Describe the challenges faced in commercialization of plant-based value-added products. [U] / [CO4]

[5x8 = 40]

Part C

Essay Questions

Answer any **1** questions

Each question carries **10** marks

23. Explain the principles and steps of value addition. [U] / [CO1]

24. Outline the process of natural dye extraction and application in textile, cosmetics and food [An] / [CO3]

[10x1 = 10]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)
FOURTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code: **MG4DSEBOTA05** Course Title: **Bio-Instrumentation and Quality Analysis 2**

Time: 2 Hrs **Maximum Marks: 70**

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part **A**:
Answer in One or Two sentences
Answer 10 questions
Each question carries 2 mark

1	What is RPM?	Remember	1
2	What is freeze-thawing?	Remember	1
3	Write any two uses of refrigerated centrifuge	Remember	1
4	What is the use of filter aid?	Remember	1
5	How will you calculate Rf value	Understand	2
6	What do you mean by adsorption chromatography?	Remember	2
7	What is the use of gel documentation system?	Remember	3
8	What you mean by Isoelectric focusing?	Remember	3
9	What is the use of stage micrometer	Remember	3
10	What is camera lucida	Remember	3
11	Describe any two applications of Scintillation counter	Remember	4
12	Explain hemocytometer	Understand	4

Part **B**:
Short Answer Type Questions
Answer 8 Questions
Each question carries 5 marks

13	Describe the principle and working of tangential filtration	Remember	1
14	Describe the principle, working and application of preparative ultracentrifuge	Remember	1
15	Describe the use of detergents and enzymes in cell disruption	Remember	1
16	Explain the applications of chromatography in pharmaceuticals and environmental science	Apply	2

17	Explain the principle and working of GC	Understand	2
18	Explain the preparation and applications of agarose gel electrophoresis	Understand	3
19	Explain the preparation and applications of Native PAGE	Understand	3
20	List out the applications of cell counting techniques in cell culture	Analyze	4
21	List out the applications of cell counting techniques in Immunophenotyping	Analyze	4
22	List out the applications of cell counting techniques in single cell analysis	Analyze	4

Part **C**:
Essay Type Questions
Answer any one question
Each Question carries 10 marks

23	With diagram explain the principle and working of Size exclusion chromatography. Add a note on its applications	Apply	2
24	Analyze the principle, working and applications of Southern blot	Analyze	3

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FOURTH SEMESTER EXAMINATION

Discipline-Specific Elective Course (DSE)

MG4DSEBOTA06: Environmental and Industrial Microbiology in Agriculture

(2024 ADMISSION ONWARDS)

Time: 2 Hrs. **Maximum Marks: 70**

Remember (K), Understand (U), Apply (A), Analyze (An), Evaluate (E), Create (C), Skill (S), Interest (I), and Appreciation (Ap)

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part A

One or two Sentences

Answer any ten questions. Each question carries 2 marks

1. What is an agroecosystem?	[K]	[1]
2. Mention any two advantages of microbial mitigation of agrochemicals.	[U]	[2]
3. Mention two microbes involved in the nitrogen cycle.	[K]	[2]
4. What is biogas?	[K]	[2]
5. Name any two products obtained through agro-industrial fermentation.	[K]	[4]
6. Write any two advantages of in situ bioremediation.	[U]	[2]
7. Differentiate between submerged and solid-state fermentation.	[U]	[3]
8. Identify the fermentation process involved in wine production and justify.	[A]	[3]
9. How does *Rhizobium* benefit leguminous plants?	[U]	[3]
10. Identify the major microbial role of Beejamrutha in seed health.	[U]	[6]
11. Why are indigenous biocontrol practices considered sustainable?	[U]	[6]
12. What is Pokkali rice cultivation?	[K]	[5]

(2 × 10 = 20)

PART - B

Short answer

Answer any eight questions. Each question carries 5 marks

13. Explain the role of microorganisms in the biodegradation of pesticides and heavy metals in agricultural soils.	[U]	[2]
14. Describe the role of microorganisms in nitrogen and phosphorus cycles in agroecosystems.	[U]	[2]
15. Describe the production of biochar and organic acids from agricultural wastes.	[U]	[4]
16. Explain microbial indicators used to assess soil and water quality in agriculture.	[U]	[1]
17. Illustrate how *Azotobacter* and phosphate-solubilizing bacteria can be applied as biofertilizers to improve crop productivity.	[A]	[3]
18. What is meant by indigenous biocontrol practices? List any five traditional microbial agents used in pest or disease control.	[K]	[6]
19. What are plant growth-promoting substances? List the microbial sources of gibberellins and indole-3-acetic acid (IAA).	[K]	[3]
20. Evaluate the environmental and economic benefits of using agro-wastes for bioenergy and organic acid production.	[E]	[4]
21. Analyse the Kaipad rice system as a model of rice–fish integrated farming.	[An]	[5]
22. Define microbial antagonism and list its types observed in traditional pest management.	[K]	[6]

(5 × 8 = 40)

PART – C

Essay

Answer any one question. Each question carries 10 marks

23. Describe alcoholic and lactic acid fermentations and give examples of their applications in the food and beverage industries.	[U]	[3]
24. Explain the traditional farming systems of Kerala. Analyze their ecological and socio-economic significance.	[An]	[5]

(10 × 1 = 10)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)
FOURTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code: **DSE** Course Title: **Principles of Agronomy and Horticulture**

Time: 2.00 Hrs **Maximum Marks: 70**

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part **A**:
Short answer type questions
Answer 10 questions
Each question carries 2 marks

	Questions	Taxonomy	CO
1	Expand INM.	Remember	2
2	State the importance of agronomy.	Remember	1
3	Write down the botanical name of dragon fruit.	Remember	4
4	Explain white revolution.	Understand	1
5	Cite one best cultivar of sapota.	Remember	4
6	What is a scion?	Understand	3
7	Name an organism used in vermicomposting.	Remember	2
8	Name one green manure.	Remember	2
9	Define micropropagation.	Understand	4
10	What is transplanting?	Remember	3
11	Who is known as the Father of the Green Revolution in India?	Remember	1
12	Give an example of a lawn grass.	Remember	3

Part **B**:
Short Essay Type Questions
Answer 8 Questions
Each question carries 5 marks

13	Outline the current trends in agricultural practices.	Remember	1
14	Describe the role of agronomy in sustainable farming.	Understand	1
15	Assess the benefits and importance of indoor gardens.	Evaluate	3
16	Discuss zero budget natural farming.	Understand	1
17	Compare the use of organic manures and chemical fertilizers.	Understand	2
18	Evaluate the role of GM crops in crop improvement.	Evaluate	4
19	Which are the land preparation techniques used in agriculture.	Remember	2
20	List the various garden components you have studied, with a brief description of each.	Remember	3
21	Explain the crop production technology of okra.	Evaluate	4
22	Write notes on the scope of horticulture.	Understand	3

Part **C**:
Essay Type Questions
Answer any one question
Question carries 10 marks

22	Write an essay on the vegetative propagation methods in plants.	Create	3
23	Explain different types of soils and their properties.	Apply	2

QP CODE **Reg.No-:-.....**
Name-:-.....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) REGULAR EXAMINATION MARCH 2026

Fourth Semester

Discipline Specific Elective Course
MG4DSEBOTA08 Artificial Intelligence in Plant Science

(2024 ADMISSION ONWARDS)

Duration: 2 Hours- Maximum Marks: 70

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

[Learning Domain][CO No(s)]

Part A

Short Answer

Answer any 10 questions

Each question carries **2** marks

1. Define Artificial Intelligence. [K][CO1]
2. Name any two AI learning models. [K][CO1]
3. What is 'data' in AI? [K][CO1]
4. Mention one use of cloud computing in AI. [K][CO1]
5. State one relevance of AI to plant taxonomy. [K][CO1]
6. What is image analysis in plant identification? [U][CO2]
7. Name any one CNN-based plant ID app. [U][CO2]
8. What is crop forecasting in AI? [U][CO2]
9. Name one AI quality standard body in agriculture. [U][CO2]
10. Mention one disease detected by AI in crops. [U][CO3]
11. Name any one mobile app used by farmers for plant disease detection. [A][CO4]
12. Mention two ways AI can support environmental sustainability in agriculture. [A][CO4]

(10 × 2 = 20)

Part B

Short Essay Type Questions

Answer 6 questions.

Each question carries 5 marks

13. Explain the scope of Artificial Intelligence in science. [U][CO1]
14. Explain the role of AI in crop classification and stress identification. [U][CO1]
15. Describe the key components of AI with examples. [U][CO1]

16. Show how CNNs are used in plant identification. [A][CO2]
17. Explain how AI integrates weather and soil data for crop forecasting. [E][CO3]
18. Outline the role of AI + IoT in irrigation planning. [An][CO3]
19. Explain how AI supports climate resilience in agriculture. [E][CO3]
20. Write the importance of agri-tech startups using AI for sustainable farming. [A][CO3]
21. Write the benefits and limitations of mobile plant disease apps. [A][CO4]
22. Explain ethical issues in AI-based plant disease prediction. [U][CO4]

(8 × 5 = 40)

Part C

Essay Type Questions

Answer 1 questions.

The question carries 10 marks

23. Explain the major AI learning models with examples from plant science. [U][CO2]
24. Evaluate the role of AI in crop forecasting, disease detection, and sustainable agriculture with real-world examples. [E][CO3]

(1 × 10 = 10)

END OF THE QUESTION PAPER

***

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)
FOURTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code: MG3SECBOT200 Course Title: BIOFERTILIZERS AND BIOCONTROL AGENTS

Time: 1.5 Hrs Maximum Marks: 50

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part A:
Short Answers
Answer 10 questions
Each question carries 1 mark

SL No	Question	Taxonomy	CO
1	Define sustainable agriculture.	Remember	1
2	Name one plant-growth promoting rhizobacteria (PGPR).	Remember	2
3	State one benefit of using Azolla in paddy fields.	Remember	2
4	Give one example of a microbial biocontrol agent.	Remember	3
5	What is the active compound present in neem?	Remember	3
6	State one property of a good carrier used in biocontrol formulation	Understand	4
7	What are wettable powders?	Understand	4
8	Name one viral biocontrol agent.	Remember	4
9	What is seed treatment?	Remember	6
10	Name one enzyme involved in composting.	Remember	5
11	What is compost enrichment?	Understand	5
12	What is vermicompost?	Understand	5

Part B:

Short Essay Type Questions
Answer 6 questions
Each question carries 5 marks

13	Summarise the practices of environment-friendly agriculture.	Understand	1
14	Explain the mechanism of egg parasitism by Trichogramma.	Understand	3
15	Examine the ecological benefits of using biocontrol agents in farming.	Analyse	3
16	Explain the need for bioformulations in modern farming.	Understand	4
17	Describe the soil application and soil drenching methods of biofertilizer delivery.	Analyze	4
18	Explain the importance of Rhizobium biofertilizer in sustainable agriculture.	Understand	6
19	Write a note on the environmental and agricultural benefits of household composting.	Understand	5

20	Identify the role of microbial additives in composting.	Apply	5

Part C:

Essay Type Questions

Answer any one question

Question carries 10 marks

21	Classify biofertilizers based on nutrient availability and explain each type with suitable examples.	Understand	2
22	Explain the methods involved in the mass production and formulation of Trichoderma.	Understand	5

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)
FOURTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

Course Code: **MG4VACBOT200** Course Title: **Conservation Biology and Sustainable Development**

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Time: 1.5 Hrs. **Maximum Marks: 50**

***Student should attempt at least one question from each course outcome to enhance their overall outcome* attainability**

Part A

Short answers
Answer 10 questions
Each question carries 1 mark

	Questions	Taxonomy	CO
1.	What is extinction?	(U)	5
2.	Expand IUCN.	(K)	5
3.	Mention any two renewable energy sources.	(K)	3
4.	List out any four principles of sustainable development?	(K)	6
5.	Name any two biodiversity hotspots in India.	(K)	4
6.	What is the Red Data Book?	(U)	5
7.	Define Conservation Biology.	(K)	1
8.	What is Ex-Situ conservation?	(U)	2
9.	Name one example of In-Situ conservation technique.	(U)	2
10.	Define sustainable development.	(C)	6
11.	Define Ecotourism. Give an example.	(K)	1
12.	Name the three pillars of sustainable development.	(K)	6

(10×1=10)

Part B

Short Essay Type Questions
Answer 6 Questions
Each question carries 5 marks

13.	Give any two examples of sustainable development with explanation?	(K)	6
14.	Briefly describe the cause of biodiversity loss?	(U)	4
15.	Explain the role of solar energy in sustainable development.	(U)	3
16.	Describe the role of statistical tools used in conservation biology.	(U)	2
17.	Write a short note on habitat destruction	(An)	5
18.	Differentiate between Ex-Situ and In-Situ conservation techniques.	(U)	2
19.	Explain the difference between ecotourism and mainstream tourism.	(K)	1
20.	What are the major threats to biodiversity and how can they addressed?	(An)	5

(6×5=30)

Part C

Essay Type Questions

Answer any one question

Question carries 10 marks

21.	Analyse the impact of ecotourism highlighting the positive and negative effects.	(An)	4
22.	Discuss the importance of sustainable development in the present scenario.	(U)	6

(1×10=10)