C 21037 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 22—GENETICS AND CROP IMPROVEMENT—II

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*

1. Write the procedure and application of biotechnological approaches in crop improvement.
2. Write an essay on the conservation of genetic resources.
3. Explain the procedure of various types of plant selection methods used for crop improvement.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. What are the different steps involved in the process of plant domestication ?
5. Write the applications of distant hybridization.
6. Write an account on different types of stress resistance in plants.
7. Explain the procedure of purity analysis of seeds.
8. Explain the different types of polyploids found in plants.
9. Write the procedure of seed certification processes.
10. Describe the role of allopolyploids in crop improvement.
11. How IPR is important in Agriculture ?
12. Briefly explain different types of mutagens.
13. Write an account on the barriers of distant hybridization.

(8 × 5 = 40 marks)

Part C

Answer any **ten** *questions in not more than* **five sentences.**

14. Write the names of two chemical and physical mutagens.
15. What is polyembrony ?
16. Name two triploid crops.
17. What is gamma garden ?
18. What is intensive farming ?
19. Differentiate between primary and secondary centre of diversity.
20. Write a note on chimera.
21. What is nif gene ?
22. What is horizontal resistance ?
23. How does pyramiding important in prevention of disease ?
24. What is chasmogamy ?
25. Write the origin and uses of colchicines.

(10 × 2 = 20 marks)

C 21036 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT4E21—GENETICS AND CROP IMPROVEMENT—I

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than 500 words.*

1. Write the breeding techniques of rice. Give an account on the different cultivars and varieties of rice cultivated in Kerala.
2. Describe the major achievements of RRII. Identify the bottle neck for the improvement of Rubber
3. Give an account on the IGAR institutes in Kerala.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. Explain the procedure of hybridization in Vanila.
5. Write floral biology of maize.
6. Give an account on different breeding methods in cardamom.
7. Write the origin and variability of coconut.
8. Write the origin of bread wheat.
9. What are the major bottle neck of research and development in tea.
10. Write an account on the activities of oil palm research Institute in Kerala.
11. Explain the floral biology and origin of ginger.
12. Briefly explain various methods of propagation in cashew.
13. Briefly explain the functions of commodity boards.

(8 × 5 = 40 marks)

Turn over

Part C

Answer any **ten** *questions in not more than five sentences.*

14. Describe the characteristic features of Panniyur-1.
15. Write the floral features of turmeric.
16. Name two varieties of Ginger.
17. What are the advantages of planting polyclonal seedlings in rubber.
18. Mention the name of two arecanut hybrids.
19. Briefly describe the reproductive features of Cardamom.
20. Write the botanical name and family of any two plantation crops
21. List out the major disease and pests in coconut.
22. Differentiate between arabica and robusta coffee?
23. Give the botanical name and botany of useful part of cardamom.
24. Write the botany of cashew fruit.
25. Expand CTCRI. Name one tapioca variety released from the institute.

(10 × 2 = 20 marks)

C 21035 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 20—APPLIED ASPECTS OF ALGAE AND CYNOBACTERIA

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any *two* questions in not more than 500 words. Each question carries 10 marks :

1. Describe the physiology of nitrogen fixation by Cyanobacteria.
2. Write an essay on the applications of Cyanobacteria.
3. Briefly narrate the methods of Cyanobacteria cultivation.

(2 × 10 = 20 marks)

Part B

Answer any *eight* questions in not more than 250 words. Each question carries 5 marks :

4. Write notes on protein extraction methods from algae.
5. How cyanobacteria increase the fertility of soil ?
6. Comment on algal bloom.
7. Write notes on hydrogen production by Cyanobacteria.
8. Discuss the production and application of cyanobacterial biofertilizer for rice crop.
9. Give a note on symbiotic nitrogen fixing genes.
10. Comment on the industrial applications of algae.
11. Write notes on Cyanobacterial toxins.
12. Explain methods of isolation of cyanobacteria.
13. Write notes on the packing and storage of biofertilizer.

(8 × 5 = 40 marks)

Part C

Answer any *ten* question in not more than five sentences. Each question carries 2 marks :

14. What are microcystins ?
15. How filamentous algae could be stained ?
16. Comment on the algal association in *Azolla* ?
17. What are diazotrophes ?
18. Give the importance of heterocyst in nitrogen fixation.
19. What are carrageenans?
20. What are Bacteriocin ?
21. Write notes on MIBs.
22. Give the importance of diatomaceous earth.
23. Comment on *Lichina pygmea*.
24. What are phycobiliproteins ?
25. Name any *two* free living cyanobacteria that can fix atmospheric nitrogen.

(10 x 2 = 20 marks)

C 21034 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 19—BIOLOGY AND TAXONOMY OF ALGAE AND CYANOBACTERIA

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*

1. Give in detail the algal classification by Fritsch. Compare it with that of Papenfuss.
2. Describe the methods of reproduction and structural features of Phaeophyta.
3 Give a note on Classification of Cyanobacteria according to Komereck *et al*. 2014.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. Write notes on algal habitats.
5. Why Volvocales are considered as dead line in evolution ?
6. Explain the evolution of sex in algae.
7. Write notes asexual reproduction methods in Rhodophyta.
8. Mention the structural features of Bacillariophyta
9. How algal bar coding is done ?
10. Write notes on the morphology of Cyanobacteria.
11. Narrate the important methods of reproduction in Cyanobacteria
12. Give a general account on the pigment constitution in red algae.
13. Give notes on the phylogeny and affinities of cyanobacteria.

(8 × 5 = 40 marks)

Turn over

Part C

Answer any **ten** *questions in not more than* **five sentences**.

14. What is an Akinete ? Give its structure.
15. What are Statospores ? In which algal groups they are seen ?
16. Differentiate pleurilocular and unilocular sporangia.
17. What are single cell proteins ? Give any *two* examples.
18. What is Frustule ? In which algal group it is seen ?
19. Why red sea is called so ?
20. Differentiate prokaryotes and mesokaryotes ?
21. Differentiate aplanospore and hypnospore
22. What is isomorphic haplodiplontic life cycle ? Give an example of algae with this life cycle.
23. What is the common name of *Acetabularia*. Give the important features of the order it belong to ?
24. Mention the significance of *Fritschiella*.
25. Name any *two* Indian cyanobacteriologists and their important contributions.

(10 × 2 = 20 marks)

C 21031 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 16—PLANT BIOTECHNOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*

1. Write an account on indirect gene transfer methods.
2. Explain how a plant with higher nutritional quality and pigmentation can be produced.
3. Write an account on uses and application of transgenic plants.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. Explain gene cloning and gene mapping.
5. Write an account on regulation of plant gene expression in plants.
6. Describe direct gene transfer techniques.
7. Explain the importance of fermentation in cleaning technology.
8. Write an account on prospect of transfer of nitrogen fixing property in a plant.
9. Write about protein coding genes and non coding RNA.
10. Degradable polymers and edible vaccines can be produced in plants. Explain how.
11. Explain how gene transfer technology can be used for enhancing insect resistance.
12. What are secondary metabolites ? Write about in vitro secondary metabolites and its enhancement.
13. Write an account on biosafety regulations and trade secrecy in a transgenic plant.

(8 × 5 = 40 marks)

Part C

Answer any **ten** *questions in not more than* **five sentences.**

14. Write about promoter sequences.
15. Point out importance of male sterility in hybrid seed production.

Turn over

16. Enlist advantages and disadvantages of genetically modified crops.
17. What is translational regulation ?
18. Explain how plant materials can be transferred across international boundary.
19. Explain bioflocculation and its applications.
20. Give an account on Golden rice.
21. Write about antiviral proteins and its production in plants.
22. What is terminator technology ?
23. Write about patenting of plant varieties.
24. Explain bioremediation with example.
25. What are biosensors and biochips ?

(10 × 2 = 20 marks)

C 21030 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT4E15—PLANT TISSUE CULTURE

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than 500 words.*

1. Explain the procedure, significance and applications of synthetic seeds.
2. What is cell suspension culture ? Explain the different types and its application with special reference to secondary metabolite production.
3. What is organogenesis ? Describe the significance and factors affecting somatic organogenesis.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than 250.*

4. Comment on surface sterilization and sterilizing agents.
5. Differentiate androgenic and gynogenic haploid plants.
6. What are elicitors ? Analyse their role in secondary metabolite production.
7. Describe the advantages of micropropagation in biodiversity conservation.
8. Discuss the steps involved in cryopreservation. Mention its significance.
9. Briefly describe the role of fusogens in somatic hybridization.
10. Explain somaclonal variation. How is somaclonal variation exploited for crop improvement ?
11. Comment on various sterilization techniques used in plant tissue culture.
12. Explain the role of various growth regulators used in tissue culture.
13. Write an account on the significance of syn seeds in germplasm, conservation.

(8 × 5 = 40 marks)

Part C

Answer any **ten** *questions in not more than five sentences.*

14. What is PCV ?
15. What is filter sterilization ?
16. Define cybrid.
17. Mention the role of NAA.
18. List out different growth regulators used in tissue culture
19. What is WPM ?
20. Define Callus.
21. Define Hardening.
22. What is surface sterilization ? Give example.
23. What is batch culture ?
24. Define Rhizogenesis.
25. What are artificial seeds ?

(10 × 2 = 20 marks)

C 21027 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 12—APPLIED ENVIRONMENTAL SCIENCE

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any *two* questions in not more than 500 words. Each question carries 10 marks :

1. Explain the types and uses of mineral resources. Write an additional description on the environmental effects of extraction and over exploitation of minerals
2. Describe air pollution, its effect on life and discuss the measures for the control of air pollution.
3. Explain the major environmental hazards that causes climate change and measures to minimise them.

(2 × 10 = 20 marks)

Part B

Answer any *eight* questions in not more than 250 words. Each question carries 5 marks :

4. Discuss the objectives of EIA.
5. Briefly explain water shed management and various strategies.
6. "Land is a treasure of resources". Comment on this.
7. Give a description on noise pollution.
8. What is global warming? Explain its beneficial and harmful effects on our planet.
9. Describe the causes, damages and management of flood with respect to the same happened in Kerala in the recent past.
10. Write about the classification of natural resources.
11. Explain the non-conventional energy resources.

12. Give a brief description on rain water harvesting methods.

13. Write a detailed account on different types of forests in the world.

(8 × 5 = 40 marks)

Part C

Answer any *ten* questions in not more than five sentences. Each question carries 2 marks :

14. Differentiate between renewable and non-renewable natural resources citing suitable examples.

15. What is photochemical smog ?

16. Define bio magnification

17. What are algal blooms? How they are formed ?

18. Write a short note on Minamata disease

19. How solid wastes are produced ?

20. Write about the Tsunami disaster in 2004

21. What is green peace ?

22. Write a brief note on Ramsar sites of India.

23. What are the causes of acid rain ?

24. What are radioactive wastes ?

25. Write about Kyoto protocol

(10 × 2 = 20 marks)

C 21026 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 11—BASIC ENVIRONMENTAL SCIENCE

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*

1. Define a Biome. Explain in detail the different types of biomes.
2. Energy flows, but matter is recycled. Substantiate the statement in the light of the biogeochemical cycles you have studied.
3. What are biodiversity hotspots ? Give an account of the biodiversity hotspots in India.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. What is Cryopreservation ? Discuss the steps involved in the process.
5. What is IUCN red list ? Briefly explain the proposed categories.
6. Compare and contrast fertility and fecundity.
7. Give an account of the forest types in Kerala.
8. Write an account on the endangered species of India.
9. What is IVI in ecology ? How is it calculated ?
10. What does environmental awareness mean ? How can it be practiced ?
11. Explain the different types of freshwater ecosystems.
12. Give an account of gene banks and seed banks. Why are they important ?
13. Briefly explain the different ways by which fertility rate can be measured.

(8 × 5 = 40 marks)

Turn over

Part C

Answer any **ten** *questions in not more than* **five sentences.**

14. Why tropical forests described as nature's pharmacy ?
15. What is IBPGR. What are its functions ?
16. What is Demography and why is it important ?
17. Give an account of the different segments of the environment.
18. Identify the ecological pyramid which is always upright. What are it's characteristic features ?
19. Differentiate primary succession and secondary succession.
20. What is an estuary and why is it important ?
21. Give an account of the factors that limit population growth.
22. How does the vegetation in tropical rainforests differ from that of tropical deciduous forests ?
23. Briefly explain the vertical stratification of vegetation in the tropical rain forests ?
24. What is Permafrost ?
25. Define Endemism.

(10 × 2 = 20 marks)

C 21025 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 10—PHYSIOLOGY OF PLANTS UNDER STRESS

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*
Each question carries 10 *marks.*

1. Give an elaborate account on physiological effect of water stress.
2. What are different types of environmental pollutants cause stress to plants.
3. Discuss on stress induced due to plant pathogen. What are the various plant defense responses against pathogen attack ?

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*
Each question carries 5 *marks.*

4. Define seed priming. Explain molecular mechanism of seed priming.
5. What is ion compartmentation ? Explain functional aspect of ion compartmentalion.
6. Explain various mechanisms operated in detoxification of plants.
7. What are major signs of oxygen deficiency stress ?
8. Explain the process of synthesis of phytochilatins.
9. Describe physiological response to UV stress.
10. Explain metabolic effect of xenobiotics.
11. What are the stress conditions induced due to intra specific and inter specific competitions ?
12. Explain stress due to chilling and freezing.
13. Define heat shock protein. Explain heat shock protein mediated thermo tolerance.

(8 × 5 = 40 marks)

Turn over

Part C

Answer any **ten** *questions in not more than* **five sentences.**
Each question carries 2 *marks.*

14. What are stress escapers ?
15. Define aquaporins. Add a note on its functional features.
16. What is ion exclusion ? Write its significance.
17. Explain physiological functions of ethylene in response to oxygen deficiency.
18. What is plant homoeostasis ?
19. Explain PAL activity towards UV stress.
20. What are anthropogenic pollutants ? Explain.
21. What are antioxidants enzymes ? Explain role of antioxidant enzymes in stress alleviation.
22. Explain functional features of LEA proteins.
23. What are metal accumulator plants ? Explain.
24. What are important oxidative damages of biomolecules induced due to ozone ?
25. What are osmotic adjustments and its role in tolerance to drought ?

(10 × 2 = 20 marks)

C 21024 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT4E09—ECOLOGICAL ASPECTS OF PLANT FUNCTIONS

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*

1. What are secondary metabolites ? Explain how plants defend themselves against herbivores.
2. Write an account on plant microbe interaction, and mention how microbes helps in nutrient assimilation.
3. Explain variations in photosynthetic efficiency in different ecosystems.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. Write an account on carbon cost of mycorrhizal symbiosis.
5. Explain show plants communicate in a neighboring area.
6. Give an account on sunfleck utilization efficiency and its impact in plants.
7. Explain pathways for electron transfer.
8. How low pH influence the carbon cost ?
9. Write an account on supply and demand of CO_2 in photosynthetic process.
10. What is biomass productivity ? Explain physiological basis for productivity.
11. Explain photo inhibition protection.
12. Write about bioenergy crops and applications.
13. Explain how roots proliferate in nutrient rich patches.

(8 × 5 = 40 marks)

Turn over

Part C

Answer any **ten** *questions in not more than five sentences.*

14. How plants can acclimatize in shade ?
15. Write about net carbon balance in a forest.
16. Write about water absorption in plants in heavy winter.
17. How can we enhance biomass production in an ecosystem ?
18. Explain cuticular conductance and boundary layer conductance.
19. What is allelopathy ? Point out the ecological impact.
20. Mention role of respiration in plant carbon balance.
21. Write about photosynthesis under high activation of RUBISCO.
22. Explain oxidative phosphorylation.
23. Differentiate net productivity and gross productivity.
24. Pointout impact of non symbiotic association of nitrogen fixing organisms in an ecosystem.
25. Enlist and explain effect of soil nutrient supply on photosynthesis.

(10 × 2 = 20 marks)

C 21023 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 08—MOLECULAR BIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any *two* questions in not more than 500 words. Each question carries 10 marks :

1. Illustrate the process of DNA replication. Elaborate involvement of various enzymes in DNA replication process.
2. Give an account on various DNA repair mechanisms.
3. Define gene knockout. Explain steps involved in the production of knockout mouse. What is its significance ?

(2 × 10 = 20 marks)

Part B

Answer any *eight* in not more than 250 words. Each question carries 5 marks :

4. What is chromosome walking. Explain with suitable illustration.
5. Define protein engineering. Give an account on objectives of protein engineering.
6. What is DNA microarray ? Explain various types of DNA microarray and its applications.
7. Explain different classes of transcription factors. With the help of schematic representation, explain role of different transcription factors in the initiation of eukaryotic transcription.
8. Describe structural features of LINEs and SINEs. Add a note on its significance.
9. Explain major post transcriptional regulation mechanisms.
10. What are functional features of snRNA and miRNA ?
11. Define gene silencing. Explain mechanism of gene silencing.

12. Define site directed mutagenesis. Explain PCR based site directed mutagenesis
13. Explain important tools used in gene editing. Write its significance.

(8 × 5 = 40 marks)

Part C

Answer any *ten* questions in not more than five sentences. Each question carries 2 marks :

14. Which method you will suggest to study the interaction of specific sequence DNA with a given protein ? What are the steps involved in this process ?
15. Define metabolomics. Write significance of metabolomics.
16. What is Cot value ? Explain.
17. What is transposon tagging ? Write applications of transposon tagging.
18. What is biopharming ? What are major applications of biopharming ?
19. Give an account on potential of antisense therapeutics in modern health care system.
20. Explain TILLING
21. Define transgenesis. Add a short note.
22. Name any DNA replication disorder. Add note on mechanism leading to disorder.
23. What are constitutive mutants ?
24. What are Mariner elements and Alu elements ?
25. What are Phyto vaccines ? How it is produced ?

(10 × 2 = 20 marks)

C 21022 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 07—CELL BIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*

1. Define 'Karyomorphometry'. Explain the utility of chromosome staining techniques in Karyotyping.
2. What is Apoptosis ? What are the different types ? How is apoptosis different from necrosis ?
3. Write a brief review on the most recent advances made in cell biology.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. Describe the role of 'CDKs' in cell cycle regulation.
5. Enlist the required precautions and safety measures to be adopted against radioactive induction.
6. How is a translocation heterozygote formed ? Illustrate the structural configurations of a translocation heterozygote during the cell division cycle
7. Write a brief note on FISH, GISH and CISH
8. With the help of illustrations, describe chromosomal morphology and nomenclature
9. Explain the concept of basic chromosome number in the light of the polyploid series of a genome.
10. Describe the utility of amniocentesis in prenatal diagnosis.
11. Viruses and bacteria are now known to cause cancer. Justify.

12. Discuss the different types of chromosome visualization techniques developed over the years.

13. Compare the structure and functions of 'cohesins' and 'condensins'.

(8 × 5 = 40 marks)

Part C

Answer any **ten** *questions in not more than* **five sentences**.

14. What is a Cytophotometer ?

15. What is super-resolution microscopy ?

16. Compare podosomes and invodopodia.

17. Name the six classes of GPCRs.

18. Justify the role of 'Wee' proteins in determining the pace of cell division.

19. What is Klerokinesis ?

20. Expand the term ISCN.

21. Highlight the difference between haploidy and polyhaploidy.

22. What is the Renner complex ?

23. What is spectral karyotyping ?

24. Define 'biological crosstalk'.

25. Write the principle of micro-densitometry.

(10 × 2 = 20 marks)

C 21019 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 04—FUNGAL SYSTEMATICS

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*
Each question carries 10 *marks.*

1. Explain briefly the preparations and long term preservation of fungal specimens.
2. Explain briefly the principles of numerical taxonomy.
3. Briefly explain the modern techniques used for fungal systematics.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. Explain the factors which affect species richness.
5. Write a note on lyophilisation.
6. How mtDNA is helpful in the taxonomy of endomopathogenic fungi ?
7. Briefly explain PCR technique.
8. What are the methods of inferring trees ?
9. Describe the phylogeny of hyphochytridiomycetes.
10. Discuss the significance of DNA bar coding in fungi.
11. Briefly explain the different fructifications in anamorphic fungi.
12. What are the major characters used in fungal taxonomy ?
13. Give the general characters of Oomycetes.

(8 × 5 = 40 marks)

Part C

Answer any **ten** *questions in not more than* **five sentences.**

14. What are glomales ?
15. What is hydrogenosome ?
16. What are outgroups ?
17. What are psychrophilic fungi ?
18. How will you produce spawn ?
19. What are sclerotia ?
20. Give the importance of *Trichoderma.*
21. What is PAS reaction ?
22. What is the use of specimen catalogue ?
23. What do you mean by teratological forms ?
24. Give any two major mycological herbaria.
25. What is glycocalyx ?

(10 × 2 = 20 marks)

C 21018 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 03—FUNGAL BIOLOGY AND TECHNOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*

1. Discuss about the fungal decomposition of cellulose and Lignin.
2. What are the different types of Fermentations and its applications ?
3. Discuss about biological control using fungi.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. Explain Parasexuality in fungi.
5. Discuss the passive and active mechanisms of spore discharge in fungi.
6. Write a note about heterokaryosis.
7. Explain the role of fungi in cheese preparation.
8. What are ergot alkaloids ?
9. How Single cell proteins from moulds are more sustainable ?
10. Explain the role of fungi in the decomposition of cellulose.
11. Explain symbiotic association between chytrid fungi and ruminant mammals.
12. Describe the structure of Fungal cell.
13. Explain the importance of Entomopathogenic fungi in agriculture.

(8 × 5 = 40 marks)

Turn over

Part C

Answer any **ten** *questions in not more than* **five sentences**.

14. What is Rhizoids ?
15. Name two antibiotics produced by fungi and their production strains.
16. What are Lichens ?
17. Name two lytic enzymes that can hydrolyse fungal cell wall.
18. What are the applications of *Trichoderma* in agriculture ?
19. What is heterokaryosis ?
20. Explain brown rot and which fungus cause it ?
21. What kind of septum is in phylum Basiodiomycota ? Explain with a diagram.
22. Name two edible mushrooms.
23. Name one ecto-mycorrhizal and one endo-mycorrhizal Fungi.
24. Name one anaerobic chytrids seen in herbivores.
25. What are saprophytic fungi ?

(10 × 2 = 20 marks)

C 21017 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 02—APPLIED ASPECTS OF ANGIOSPERM TAXONOMY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any two questions in not more than 500 *words. Each question carries* 10 *marks :*

1. Write an essay on the format and major components of a taxonomic research article. Add a note on publication ethics.
2. Explain in detail about taxonomic keys, types and its construction.
3. Write an essay on ethics in taxonomy.

(2 × 10 = 20 marks)

Part B

Answer any *eight* in not more than 250 words. Each question carries 5 marks :

4. Explain the procedure of collection of bamboos and succulents.
5. Explain different types of typification.
6. What are the procedures involved in the recognition and publication of a new plant species ?
7. Explain different types of racemose inflorescence.
8. Write a short essay on DNA barcoding in plants.
9. Explain the conditions in which a plant name is rejected.
10. Briefly describe the plan, preparation and presentation of project proposals.
11. What is IUCN? Explain its role and categories.
12. What is Index Kewensis and Index Londinensis ?
13. Explain the role of barcodes and QR codes in digital herbarium and gardening.

(8 × 5 = 40 marks)

Turn over

Part C

Answer any *ten* in not more than five sentences. Each question carries 2 marks :

14. What is Index Herbariorum ?
15. Differentiate between critically endangered species and vulnerable species.
16. What is synandrous stamen ? Give example
17. Explain the various floral aestivation with example.
18. Explain the procedure of preservation of pollens and seeds.
19. What is KBD, IPNI, ICN, K and E.
20. Explain neotypification and epitypification.
21. Explain the major types of phyllotaxy with example.
22. Define herbarium. Give any *four* examples.
23. What is BPH ?
24. Explain OTU.
25. Name any *four* major floras of India.

(10 × 2 = 20 marks)

C 21016 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Applied Plant Science

BOT 4E 01—THEORETICAL ASPECTS OF ANGIOSPERM TAXONOMY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **two** *questions in not more than* 500 *words.*

1. Explain the diagrammatic representation of phylogenetic relationships of angiosperms.
2. Write a detailed account on isolating mechanisms and the kinds of speciation.
3. Briefly discuss the cladistics methodology.

(2 × 10 = 20 marks)

Part B

Answer any **eight** *questions in not more than* 250 *words.*

4. Explain the role played by APG in modern plant systematics.
5. Discuss the application and relevance of chemotaxonomy in systematic studies.
6. Briefly discuss the origin of monocots.
7. Describe the terms monophyly, polyphyly and paraphyly with Dahlgren's cutting rule.
8. Discuss the views on homology and analogy in systematics.
9. Give a detailed note on vicariance biogeography.
10. Write an account about patterns of distribution.
11. Write critical note on the objectives and scope of taxonomy.
12. Comment on coding of characters in cladistics.
13. Write notes on supraspecific categories. Cite suitable examples.

(8 × 5 = 40 marks)

Turn over

Part C

Answer any **ten** *questions in not more than* **five sentences**.

14. Role of semantides in systematics.
15. Demerits of APG system.
16. Concept of ideal species.
17. Comment on the approach of eclecticism.
18. Define Convergence.
19. OEUs in cladistics.
20. Major secondary metabolites considered in systematies.
21. Comment on infraspecific categories.
22. Differentiate phenotypic plasticity and ecophenes.
23. Define symplesiomorphy and synapomorphy.
24. Write note on the principle of parsimony.
25. What is Heterobathmy ?

(10 × 2 = 20 marks)