C 2650 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 4E 22—GENETICS AND CROP IMPROVEMENT—2

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

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

1. Describe various types of mutations ? How mutations are used in crop improvement ?
2. Write an account on the various types of reproduction and mating systems in crop plants.
3. Briefly explain the different centers of diversity and their importance.

(2 × 10 = 20 marks)

Part B

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

4. What are Autopolyploids ? How autopolyploidy is induced in crop plants.
5. Explain the genetics of nitrogen fixation.
6. How do gene banks are important for conservation ?
7. Write the merits and demerits of distant hybridization.
8. Give a short account on the farmer's rights and plant breeders rights.
9. Discuss the major achievements of biotechnological approach in crop improvements.
10. Describe the procedure for the release of a variety.
11. Briefly explain the different steps involved in pureline selection.
12. Write the importance of stress resistance in plants.
13. Write an account on the barriers of distant hybridization.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. What are the different types of emasculation ?
15. Write short note on Triticale.
16. What is progeny test ?
17. Write down the expansion of TRIPS and its importance.
18. What are certified seeds ?
19. Describe the term quarantine.
20. What do you mean by ex-situ conservation. Write an example.
21. What is vertical resistance ?
22. Name two national parks.
23. What is recombinant DNA ? Write one application.
24. What are allopolyploids ?
25. How do triploids produce artificially ? Write two examples of triploid crops.

(10 × 2 = 20 marks)

C 2649 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 4E 21—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.*
Each question carries 10 *marks.*

1. Give an account on the major activities of two institutes under CGIAR.
2. Write an account on the floral biology and breeding techniques of Maize.
3. Briefly explain the variability, propagation and breeding of pepper.

(2 × 10 = 20 marks)

Part B

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

4. Briefly explain the constrains in the development of oil palm in India.
5. Briefly explain the functions of commodity boards.
6. Write an account on the major research centers for arecanut.
7. Write the floral biology and pollination biology of Cardamom
8. Give an account on the modern methods used in the breeding of Ginger.
9. Give a short account on the crop improvement and management of Coffee.
10. Explain the technique of hybridization in Vanilla.
11. Name the coconut research stations in Kerala and explain their major research activities.
12. Briefly give an account on the major cultivars and clones of tea.
13. What are the different methods used for the improvement of turmeric ?

(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 is panicle ? Write an example of a crop bearing panicle.
15. Write the botany of fruit and seed of cashew.
16. Briefly explain the propagation methods of Turmeric.
17. What is IISR ? Write the major research work in the institute.
18. Write the beneficial effects of shade in coffee.
19. What are the advantages of polyclonal seedlings in rubber.
20. Write the botanical name and botany of useful part of any two spices.
21. What is golden rice ?
22. Write the major research activities of CTCRI.
23. Name the rice research stations in Kerala. Mention the name of one variety released in Kerala.
24. Briefly describe the method of crop management in cardamom.
25. Write the bottle neck of coffee breeding.

(10 × 2 = 20 marks)

C 2648 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*

1. Write notes on commercial cultivation of algae.
2. Mention the economic importance of Cyanobacteria.
3. Mention the physiology of nitrogen fixation by Cyanobacteria.

(2 × 10 = 20 marks)

Part B

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

4. Give notes on protein products from Cyanobacteria.
5. Mention the quality criteria for cyanobacterial inoculants.
6. Give notes on the application of cyanobacteria in rice fields.
7. How cyanobacteria are exploited in hydrogen production ?
8. Briefly explain the methods of algal staining.
9. What is algal bloom ? How is it caused ?
10. Mention the role of cyanobacteria in biofuel production.
11. Give notes on methods of Cyanobacteria cultivation.
12. Describe the role of algae in sewage disposal.
13. Give the methods for the purification of cyanobacteria.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. How non-heterocyst cyanobacteria fix nitrogen ?
15. Mention the cyanobacterial association on *Gunnera*.
16. Mention the applications of cyanobacteria as cosmetics.
17. Name any *four* algae used as feed.
18. What is biodegradation ?
19. How bioccumulation is different from bioremediation ?
20. What are Phycocolloids ?
21. What is algal bloom ?
22. What are Geosmins ?
23. Write notes on nod genes.
24. What is enrichment culture ?
25. What is minimal medium ?

(10 × 2 = 20 marks)

C 2647 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*
Each question carries 10 *marks.*

1. Give a comparative analysis of algal classification by Smith and Fritsch.
2. Explain in detail about the reproduction and structure of Rhodophyta.
3. Give an account of the various types of thallus organisation seen in Chlorophyta.

(2 × 10 = 20 marks)

Part B

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

4. Give a note on Classification of Cyanobacteria according to Komereck *et al. 2014.*
5. Explain different methods of cultivation of cyanobacteria.
6. Explain the modern trends in the classification of algae.
7. Write notes on algal monographs from India.
8. Explain the evolution of sex in algae.
9. How cyanobacteria could be preserved ?
10. Mention the role of algae as ecological indicators.
11. Narrate the important methods of reproduction in Cyanobacteria.
12. Write an account of algal habitats.
13. Give an account on the reproduction in Dinophytes.

(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 is heterocyst ?
15. Differentiate autospores and auxospores.
16. Differentiate aplanospore and zoospore
17. What is raphe ? In which algal group it is seen ?
18. What is commonly called as Irish moss ? Mention its importance
19. Write notes on carrageenin.
20. Write a note on mesokaryotes.
21. Give any four different shapes of chloroplast seen in algae.
22. What is red tide ? How is it caused ?
23. What is diplontic life cycle ? Give an example.
24. Mention a parasitic algae. Name the disease caused by it.
25. What is a pyrenoid ?

(10 × 2 = 20 marks)

C 2646 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 4E 18—APPLIED PTERIDOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

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

1. Write an account on threatened pteridophytes in India and suggest strategies for conservation.
2. Explain polyploidy in Pteridophytes with suitable examples.
3. Explain briefly the significance of molecular taxonomy in Pteridophytes with suitable examples.

(2 × 10 = 20 marks)

Part B

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

4. Give an account on Indian Psilophytales and list out the distinguishing characters.
5. Discuss the contribution of Indian Pteridologist, S.S.Bir.
6. "Pteridophytes can be included under ornamental plants". Comment.
7. Give an account on Indian fossil sphenopsids.
8. Describe the characteristic features of Lycopsida.
9. Briefly describe the merits and demerits of classification proposed by Foster and Glifford.
10. Describe the sporocarp of *Salvinia*.
11. Write an account on heterospory and seed habit.
12. With suitable example discuss the adaptations of halophytic pteridophytes.
13. Describe the fife history of *Osmunda*.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. Name two geophilous heterosporous pteridophytes.

15. Name a fungi that can be used as ecological indicator and mention the reason.

16. Name the order of Pteridophytes which are commonly known as floating ferns. Give any *two* genera under this order.

17. What do you mean by RET ?

18. Name the Pteridophytes having highest and lowest chromosome number and indicate the gametic number.

19. Is selaginella heterosporous ? Substantiate your answer.

20. Distinguish between Sporophyll and Sporangia.

21. Draw an L.S. of Equisetum strobilus.

22. Give any *four* medicinal importance of Pteridophytes.

23. Write short notes on tree ferns.

24. Describe the gametophyte in Marattiales.

25. Discuss the nature of stele in Ophioglossales.

(10 × 2 = 20 marks)

C 2645 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 4E 17—BASIC PTERIDOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

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

1. Give an account on alternation of generation in Pteridophytes.
2. Mention various theories suggesting the origin of Pteridophytes.
3. Explain the pattern of development of gametophyte in a heterosporus fern.

(2 × 10 = 20 marks)

Part B

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

4. Discuss the morphological diversity in Pteridophytes.
5. Describe the development of sporangia in eusporangiate ferns.
6. Give notes on different types of protostele.
7. Discuss the significance of *invitro spore* culture in Pteridophytes ?
8. Listout the salient features of pteridophytes.
9. Describe the rhizome anatomy of *Marselia* ?
10. Write an account on spore germination in homosporous ferns.
11. Briefly explain the morphology of gametophytes in pteridophytes.
12. What do you mean by apogamy ? Describe the different types.
13. What is telome theory ? What are its merits ?

(8 × 5 = 40 marks)

Turn over

Part C

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

14. What is Heterospoiy ? Give an example of a heterosporous fern.
15. Distinguish between dictyoxylic and dicyclic siphonostele.
16. Describe the structure of archegonium.
17. What are Sporocarp ?. Give an example of a fern bearing sporocarp.
18. What is parthenogenesis ? Name a pteridophyte showing this phenomenon.
19. Distinguish between sporangium and sorus ?
20. What is Prothallus ?
21. Briefly describe the evolution of sorus ?
22. What do you mean by heterophylly ?
23. Write notes on prototracheophyta.
24. Differentiate trilete and tetrahedral spore ?
25. List out four advanced features of pteridophytes.

(10 × 2 = 20 marks)

C 2644 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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. Explain how a genetically modified plant with improved herbicide resistance can be developed.
2. Explain Agrobacterium mediated gene transfer in plant. Mention the possibility of using this method in monocots.
3. Write an account on structure and expression of a eukaryotic gene.

(2 × 10 = 20 marks)

Part B

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

4. Write an account on gene mapping and gene cloning.
5. Give an account on applications of transgenic plants in pharmaceutical industry.
6. 'Plant cell can be considered as a factory and it can be engineered for secondary metabolite production'. Explain.
7. Write an account on biorisks in producing a transgenic plant.
8. 'Nutritional quality of a plant be enhanced using biotechnological approaches'. Explain.
9. Write about direct gene transfer techniques in plants.
10. How can we artificially provide resistance to bacteria in a crop
11. Explain biological nitrogen fixation and mention significance of nif genes in plant biotechnology.
12. Explain how plants can be used for production of degradable plastics.
13. Describe how gene expression is regulated in plants.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. Write an account on edible vaccines.
15. Explain bioremediation.
16. Can shelf life of a fruit can be enhanced using biotechnology ? Explain how.
17. What is a bioreactor ? Mention the importance and applications.
18. Write about importance of non coding RNA.
19. Write an account on patenting of plant varieties.
20. Point out importance of fermentation in environmental biotechnology.
21. Write about biochips.
22. With an example, mention how pigmentation of flower can be modified using biotechnology.
23. Explain macro injection and macro injection.
24. Explain how biotechnology can be used for cleaning environment.
25. Mention importance of male sterility in hybrid seed production.

(10 × 2 = 20 marks)

C 2643 **(Pages : 2)** **Name**.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 4E 15—PLANT TISSUE CULTURE

(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. What do you mean by somaclonal variation ? Explain its significance and application.
2. What is somatic embryogenesis ? Explain types and its application with suitable examples.
3. Explain the major applications of Plant Tissue Culture.

(2 × 10 = 20 marks)

Part B

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

4. Explain the different stages of micropropagation.
5. Describe the in vitro production of secondary metabolites using suspension culture and its application.
6. What is somatic hybridization ? What are the various steps and significance of somatic hybridization ?
7. Describe the major applications of micropropagation over conventional methods of propagation
8. What is tissue culture media ? Explain the major components with special reference to MS medium.
9. Briefly describe the role and significance of cryopreservation.
10. Comment on growth regulators used in plant tissue culture.
11. Explain callus culture and its application.
12. What is the sterilization techniques used in plant tissue culture ?
13. Briefly explain the different stages of somatic embryo formation.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. Define organogenesis.
15. What are syn seeds ?
16. Define dedifferentiation.
17. Mention the role of BAP.
18. What is cryoprotectants ?
19. What is EDTA ? Mention its use.
20. Define caulogenesis.
21. Define gyrogenic haploids.
22. What is osmoticum ? Give example.
23. What is the role of HEPA ?
24. Define totipotency.
25. What is suspension culture ? Mention different types of suspension culture.

(10 × 2 = 20 marks)

C 2640 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*

1. Describe various categories of energy resources. How the present day energy crisis can be resolved ?
2. Comment on the role of NGO's in environmental protection.
3. Explain the causes and effects of water pollution with special emphasis in the Indian scenario. Suggest the remedial measures to minimise it.

(2 × 10 = 20 marks)

Part B

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

4. Describe various types of water resources and their uses.
5. Briefly describe about thermal pollution mentioning their causes, effects and control measures.
6. Give a detailed account on solid waste management.
7. "Sustainable development is needed for improving the quality of life". Comment on this.
8. Enumerate various types of natural resources.
9. What is acid rain? Explain its environmental effect.
10. Describe briefly the hazardous effects of earth quakes and the methods to mitigate them.
11. Give a detailed account on forest types of India.
12. Briefly explain the methods of rain water harvesting.
13. Write about the Environment Protection legislations.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. What is the aim of EIA ?
15. Write an account on CNG.
16. What is BOD ?
17. Write the significance of 'super bugs' ?
18. Write a short note on Chernobyl disaster.
19. Give an account on Kyoto protocol.
20. Write a short account on radioactive wastes.
21. What are the role of WWF.
22. What are the causes of solid wastes ?
23. What is radioactive fallout ?
24. Give a short note on Gaia hypothesis.
25. Write about Ramsar sites.

(10 × 2 = 20 marks)

C 2639 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*
Each question carries 10 *marks.*

1. Define an ecosystem. Give an account of the structure and functions of the ecosystems.
2. Write an essay on biodiversity at national and local levels.
3. Give an account of the various characteristics of populations.

(2 × 10 = 20 marks)

Part B

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

4. Energy moves life. Substantiate.
5. What is an ecological pyramid ? Explain the different types of ecological pyramids.
6. Compare and contrast lotic and lentic ecosystems.
7. Elucidate the characteristic features of the various grassland ecosystems.
8. Draw an energy pyramid based on the 10% law of energy transfer between the different trophic levels from producers to tertiary consumers.
9. Give an account of the various ex-situ strategies for biodiversity conservation.
10. What is population ecology ? What are its characteristics ?
11. Explain the various ways to measure mortality.
12. Give a general account on the dispersion patterns of organisms in a population.
13. Give an account on shola forests.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. Differentiate biotic potential and reproductive potential.
15. Species diversity is high in tropics. Give reasons.
16. What is carrying capacity ?
17. Write the importance of genetic diversity in terms of survival and sustainability of ecosystems.
18. Why coral reefs are often referred to as the rain forest of the oceans ?
19. Differentiate a food chain and a food web.
20. Write a note on the factors that affect aquatic ecosystems.
21. What are cold deserts ?
22. Give the characteristics of savannas.
23. What is a taiga ?
24. What is quadrat method ? How is it useful in environment studies ?
25. Write the criteria a region must fulfil to qualify as a biodiversity hotspot.

(10 × 2 = 20 marks)

C 2638 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*

1. What are physiological changes in plants under nutrient deficiency stress ? Explain.
2. Describe various heat stress response in plants.
3. Give an elaborate account on physiological effects of water stress.

(2 × 10 = 20 marks)

Part B

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

4. What are effects of chilling and freezing stress ?
5. Give an account on detoxification of allelochemicals.
6. Describe induction of CAM metabolism in relation to water stress.
7. Give an account mechanism and significance of mycorrhizal association.
8. What is salt injury ? Add a note on strategies to avoid salt injuries.
9. Describe major air polluting agents ? How they affect sustenance of crop plants.
10. Explain effects of oxygen deficiency stress.
11. How weeds act as agent of biotic stress ? Explain.
12. What are metal accumulators ? Explain avoidance and amelioration mechanism.
13. Write various defense mechanisms operated against pathogen attack.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. Explain role of LEA proteins on controlling stress.
15. What are phytochilatins ?
16. Explain effect of greenhouse gases on inducing plant stress.
17. What are molecular chaperons ?
18. Explain ABA-independent osmotic stress responsive signals.
19. Explain the process of hardening and acclimatization.
20. How chilling affect normal functioning of plants ?
21. What are residual effects of pesticides in plant metabolism ?
22. What are osmolites ?
23. What is ion exclusion ?
24. What are anerobic stress proteins ?
25. Give a short account on UV absorbing compounds in plants.

(10 × 2 = 20 marks)

C 2637 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 4E 09—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.*
Each question carries 10 *marks.*

1. Write an account on legume-rhizobium association and its impact in ecosystem. Explain the carbon cost of such association at different pH.
2. Explain electron transfer via cytochrome and alternative pathways.
3. What is biomass productivity ? Explain variations of productivity in different ecosystem and factors regulating the productivity.

(2 × 10 = 20 marks)

Part B

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

4. Explain the impact of soil nutrient supply on photosynthesis.
5. Illustrate and explain carbon cycle.
6. What is allelopathy ? Write about applications giving examples.
7. Explain the features for survival of resurrection plants.
8. Write a note on effect of irradiance and CO_2 on leaf conductance.
9. Explain how plants balance for carbon gain in drought stress.
10. Explain importance of plant microbe interaction in the productivity of ecosystem.
11. 'Plant defend themselves against herbivores' Explain how.
12. Explain the physiological basis of productivity.
13. Write a note on physiological and anatomical differences between sun and shade trees.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. Explain photo inhibition.
15. Mention importance of field capacity of soil.
16. Plants are not killed by their own poisons. Why ?
17. Explain sunfleck utilization efficiency.
18. Write a note on heat production in plants.
19. Write about excretion of organic chelates.
20. 'Plantscan communicate to neighboring plant' Substantiate.
21. Can isolated mitochondria produce ATP ? Explain how.
22. What is transpiration ? Point out the importance.
23. Write about bioenergy crops.
24. Write a note on phosphorus uptake.
25. Point out effect of excess light in plants.

(10 × 2 = 20 marks)

C 2636 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*

1. What are transposable elements (TEs) ? Give an elaborate account on eukaryotic TEs.
2. Discuss role of various enzymes in DNA replication process.
3. Describe important tools used in nucleic acid characterization.

(2 × 10 = 20 marks)

Part B

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

4. Define site directed mutagenesis. Explain oligonucleotide directed mutagenesis.
5. Explain post replication repair and recombinational repair.
6. Give an account on activity of gRNA.
7. Define gene therapy. What are major approaches in gene therapy ?
8. Compare gene knockout and knock-in.
9. Explain SHOM and FAIRE -Seq approaches.
10. Illustrate antisense technology. Add a note on major achievements in antisense technology.
11. Give an account on various gene transfer techniques.
12. Explain translational and post translational gene regulation process.
13. What are nucleic acid analogs ? Explain significance.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. What are VNTR and Y-STR ?
15. What is operon concept. Give an example.
16. Compare cisgenesis with transgenesis.
17. What is Ribonomics ? Explain.
18. What is metabolite engineering (ME) ? Add a note on applications of ME.
19. Give an account biopesticides produced through GMOs.
20. What is gene theft ? Explain.
21. Explain how trinucleotide repeat expansion (TNRE) occur.
22. What is transcriptional bursting ?
23. What is bridged nucleic acid ? Explain.
24. Define Cot-values. Write significance.
25. What is microDNA ? Add a short note on structural and functional aspects of micro DNA.

(10 × 2 = 20 marks)

C 2635 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*
Each question carries 10 *marks.*

1. Write an account on the most useful cytogenetic characterization techniques.
2. Name the different phases of the cell cycle. Explain the functions of the major proteins that get activated during cell cycle.
3. What are the human syndromes caused due to numeric and structural variations in chromosomes ? Describe the associated changes in phenotype.

(2 × 10 = 20 marks)

Part B

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

4. Highlight the importance of GPCR family of proteins.
5. Describe the different types of apoptosis. Explain how apoptosis differs from necrosis ?
6. Highlight the difference between benign and malignant tumours.
7. Explain and illustrate the breakage fusion bridge cycle.
8. Describe the different types of extracellular cell signalling pathways.
9. Discuss the different types of cancers. Predict the involvement of causative agents in initiating cancer.
10. How did the chromosome banding techniques help in revealing the cytogenetics of chromosomes ?
11. Elucidate the primary differences between aneuploidy and polyploidy.
12. What is a cell bank ? Explain its utility.
13. Explain how cell cycle checkpoints ensure a smooth passage through the cell cycle.

(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 is photodynamic therapy ?
15. Briefly explain the new type of cell division that was discovered recently.
16. What is the difference between homologous and homeologous chromosomes ?
17. How is virtual karyotyping conducted ?
18. What is dbCRlD ?
19. How does chromosome elimination occur ?
20. How does the Ph chromosome influence chromosome pairing ?
21. What is the role of p53 gene in the human genome ?
22. What are cytostatic agents ?
23. What is acute radiation syndrome ?
24. What is micro-cinematography ?
25. What is protein-sorting ?

(10 × 2 = 20 marks)

C 2632 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*

1. Compare the general characters of fungal analogues with that of true fungi.
2. Explain briefly the classification of fungi by Tedersoo *et al.*, 2018.
3. How will you preserve fungal culture ?

(2 × 10 = 20 marks)

Part B

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

4. How will you extract fungal DNA ?
5. Explain the importance of fungal herbaria.
6. Give the special characters of chytridiomycetes.
7. Explain Melbourne Code, 2012. What are the major changes in Melbourne code in fungal systematics ?
8. Explain RFLP.
9. Give the importance of PAS reaction in fungal studies.
10. Explain the importance of numerical taxonomy.
11. What are the general characters of anamorphic fungi ?
12. Explain briefly cluster analysis.
13. How will you isolate filamentous fungi ?

(8 × 5 = 40 marks)

Turn over

Part C

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

14. What are Mycotoxins ?
15. Define Clade.
16. What are predaceous fungi ?
17. Define Gene tree.
18. What is a Morphotype ?
19. Explain Parasexuality.
20. What is an Apothecium ?
21. Give example for any *two* fungal culture medium.
22. Briefly explain DNA bar coding.
23. Name the equipments required for fungal collection.
24. Write a note on UPGMA.
25. What is a Plasmodium ?

(10 × 2 = 20 marks)

C 2631 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*
Each question carries 10 *marks.*

1. Describe the importance of fungi in maintaining balance of the environment.
2. Summarize the role of fungi in food and beverage preparation.
3. Describe the applications of Fungi in Agriculture.

(2 × 10 = 20 marks)

Part B

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

4. Explain the importance of Entomopathogenic fungi in agriculture.
5. Write critical notes on phylogenic trends in fungi.
6. Discuss about solid state fermentation (SSF).
7. Explain the important characteristics of Basidiomycotina.
8. What is the difference between an endemic pathogen and an opportunistic pathogen ?
9. How do Single cell proteins from moulds are more sustainable ?
10. Describe 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 Oogamous reproduction in Fungi.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. Describe Anisogamy in Fungi.
15. What is Holocarpic thallus ?
16. Differentiate between endospores and conidia.
17. What are the components of Fungal cell wall ?
18. What is aspergillosis ?
19. Briefly explain the Citric acid by fermentation.
20. Write a note on mycetism.
21. What is dolipore septum ?
22. Name two commonly cultivating fungi.
23. Which fungus is known as kōji mould ? List out its use also.
24. Name any two mycorrhizal Fungi.
25. Describe the etiology and pathogen of soft rot disease of Ginger.

(10 × 2 = 20 marks)

C 2630 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*

1. Write an essay on the role of computer application in Taxonomy.
2. Explain in detail about the major sources of taxonomic references.
3. Define Herbarium. Explain the different steps in herbarium specimen making.

(2 × 10 = 20 marks)

Part B

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

4. Explain the procedure of collection of palms and banana.
5. Briefly explain Holotype, Lectotype and Neotype.
6. What are the major roles of IPNI and ICN ?
7. Write a short note on different IUCN redlist categories with example.
8. Explain the major herbariums of the world.
9. What is Art. 9.2 of Melbourne Code states about ?
10. What is the difference between flora, monographs and revisions ?
11. What are the common technical terms used in nomenclatural citations ?
12. What are the herbarium ethics ?
13. Give a brief account of DNA barcoding in plants.

(8 × 5 = 40 marks)

Turn over

Part C

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

14. What is Homonym ?
15. Explain Digital garden and digital herbarium.
16. Explain epitypification.
17. What is KBD ?
18. Define BPH.
19. What are Autonyms ?
20. Name any *four* International Plant Taxonomy Journals.
21. Write the full form of JNTBGRI and MBGIPS.
22. What is a protologue ?
23. Define TaxLit.
24. Describe any *four* publication ethics.
25. Give any *four* examples of plant scientific name with proper author citation.

(10 × 2 = 20 marks)

C 2629 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(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.*
Each question carries 10 *marks.*

1. Give a detailed account on the use of chemical compounds in plant systematic studies with suitable examples.
2. Write a critical note on the various theories proposed for the origin of angiosperms.
3. Discuss the role played by APG in angiosperm systematics.

(2 × 10 = 20 marks)

Part B

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

4. Discuss how the phytogeographical data are exploited in plant taxonomy.
5. Distinguish between parallelism and convergence.
6. Write an account on evolutionary species concept.
7. Discuss the doctrines pertaining to pleomorphic and apomorphic characters.
8. Describe coding of characters in cladistics.
9. Comment on patterns of distribution. How do these influence plant taxonomic studies ?
10. Discuss the scope of plant taxonomy.
11. Write brief account on additive speciation.
12. Write notes on the units of classification.
13. Write notes on the events behind the concept of vicariance biogeograpohy.

(8 × 5 = 40 marks)

Part C

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

14. What is meant by an ideal species ?
15. Comment on semantides.
16. Write notes on infraspecific categories.
17. Distinguish between symplesiomorphy and synapomorphy.
18. Write notes on speciation.
19. Comment on special homology and serial homology.
20. What are the demerits of APG ?
21. What is meant by autapomorphy ?
22. What are main objectives of taxonomy ?
23. What is eclecticism ?
24. Comment on isolation.
25. Define comparium.

(10 × 2 = 20 marks)