C 20672 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Plant Science

PLA 6B 11—BIOTECHNOLOGY

(2019 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. Expand RAPD, RFLP, AFLP, ISSR.
2. What are synthetic seeds ?
3. Name four enzymes used in biotechnological processes ?
4. Explain Golden rice ?
5. What is RNA silencing ?
6. What is an Explant ?
7. What is the difference between Ti Plasmid and Ri Plasmid ?
8. What are bacteriophages ?
9. Give two advantages of plant tissue culture ?
10. Explain southern blotting ?
11. What are secondary metabolites ?
12. Explain sterilization methods in plant tissue culture ?
13. What is the significance of selectable markers in plasmids ?
14. What is Microinjection ?
15. Differentiate between exonucleases and endonucleases ?

(10 × 3 = 30 marks)

Turn over

Section B

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. What is DNA sequencing ? Explain different types of sequencing methods ?
17. Name and elaborate different molecular techniques used for disease diagnosis ?
18. Explain direct methods of gene transfer in plants ?
19. What are Hormones ? Explain plant hormones with examples.
20. Write short note on a) Bioreactors ; and b) Downstream processing.
21. Explain Southern, Northern and Western blotting techniques ?
22. What are the biosafety concerns in transgenic plants ?
23. Write short note on a) Callus culture ; b) Genetic manipulation ; and c) Cell suspension culture ?

(5 × 6 = 30 marks)

Section C

Answer any **two** *questions.*
Each question carries 10 *marks.*

24. What are Antibiotics ? Explain in detail the production of different antibiotics with suitable examples ?
25. What is Plant tissue culture ? Explain the steps and different types of cultures in plant tissue culture ?
26. What is rDNA technology ? Explain in detail the tools and steps involved?
27. What are Plasmids ? Illustrate the structure of pBR322 ?

(2 × 10 = 20 marks)

C 20671 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Plant Science

PLA 6B 10—HORTICULTURE AND PLANT BREEDING AND BIOSTATISTICS

(2019 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*

Each question carries 3 *marks.*

All questions can be attended.

Overall Ceiling 30.

1. Define plant breeding and write its objectives.
2. What is seed dormancy. Write two methods to overcome seed dormancy.
3. What is bonsai ? Write the basic principle of making bonsai.
4. What are the different branches of horticulture ?
5. Name two diseases found in horticultural plants.
6. What are different types of soil ?
7. What are the advantages of organic fertilizers ? Write one example of organic fertilizer.
8. Explain the drip irrigation and gravity irrigation
9. Write the objectives of two national breeding institutes in Kerala.
10. Write the importance of colchicines in plant breeding.
11. What is mist chamber ? Write its application.
12. Define landscaping.
13. Define hybridvigour.

14. Briefly explain the importance of soil analysis.

15. Define standard deviation. Write its significance.

(10 × 3 = 30 marks)

Section B

Answer at least **five** *questions.*

Each question carries 6 *marks.*

All questions can be attended.

Overall Ceiling 30.

16. Write the principle, selection of plants and maintenance of indoor plants.

17. Give an account on the cultivation and post harvest management of Rose and Jasmine.

18. Describe the different types of budding. How budding is different from that of grafting.

19. Write a short account on the different types of mutagens used in mutation breeding.

20. Write the cultivation and post harvest management of orchids.

21. Explain different types of seed viability tests.

22. Give a short account on the plant genetic resources and its significance.

23. Write an account on the Oyster mushroom cultivation.

(5 × 6 = 30 marks)

Section C

Answer any **two** *questions.*

Each question carries 10 *marks.*

24. Briefly explain the presentation of data in statistics.

25. Write an essay on the different methods of pest control in horticultural plants.

26. Briefly explain different types selection used in the plant breeding.

27. Give an account on the micropropagation of plants.

(2 × 10 = 20 marks)

C 20670 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Plant Science

PLA 6B 09—GENETICS, EVOLUTION AND ECOLOGY

(2019 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. What is dihybrid cross ? Write Mendelian dihybrid ratio.
2. Suggest genetic mechanism involved in the self-sterility of *Nicotiana*.
3. Define mutation. What are physical mutagens ? Give an example.
4. What type of inheritance you have been studied in coiling pattern of snails ?
5. Define linkage and crossing over.
6. What is recessive epistasis ?
7. What is genetic drift ?
8. What are protenoids and prions ?
9. What is evolutionary clock ?
10. Compare sympatric and allopatric speciation.
11. Illustrate carbon cycle.
12. Name biotic and abiotic components of an ecosystem.
13. What are mega diversity nations and hotspots ?

14. Expand the following; IUCN, WWF and NBPGR.

15. What are greenhouse gases ?

(10 × 3 = 30 marks)

Section B

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. State Mendel's laws of inheritance.

17. What is sex linked inheritance ? Explain Morgan's experiment.

18. What are complementary genes ? Illustrate complementary gene effect in flower colour of sweet pea.

19. Discuss arguments and support for Darwinism.

20. What are hydrophytes ? Enumerate various hydrophytic adaptations.

21. What are important biodegradable and non-biodegradable pollutants ? Suggest important measures to reduce such pollutants.

22. Give an account on renewable natural resource.

23. How will you determine density, frequency, abundance and dominance of populations ?

(5 × 6 = 30 marks)

Section C

Answer any **two** *questions.*
Each question carries 10 *marks.*

24. What is mutation ? Give an elaborate account on different types of mutations ? Add a note on mutagens

25. What are major views and theories on origin and evolution of species ? Discuss.

26. Define biodiversity. Give an elaborate account on levels and values of bio-diversity.

27. What are major global environmental challenges ? Add a note on initiatives made by world organizations to take up these challenges.

(2 × 10 = 20 marks)

C 20669 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Plant Science

PLA 6B 08—CELL BIOLOGY, MOLECULAR BIOLOGY AND BIOINFORMATICS

(2019 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. Give an example for polytene chromosomes.
2. What are Q-bands ?
3. Give the basic constituents of cytoskeleton of a cell.
4. What is a metacentric chromosome ?
5. What is the primary function of the nucleolus ?
6. Who proposed the one gene one polypeptide hypothesis ?
7. What is wobble-hypothesis ?
8. What is bacterial transformation ?
9. What is miRNA ?
10. Name the stop codons.
11. What is stored at TrEMBL ?
12. Expand the term PAUP.
13. What is sequence homology ?

14. What is a biological database ?

15. Name the genome database for *Drosophila*

(10 × 3 = 30 marks)

Section B

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. Differentiate between euploidy and aneuploidy.

17. Differentiate between the chromosome structure at metaphase of mitosis and meiosis-I.

18. Explain the somatic and gametic chromosome number of a species using numerical examples.

19. What is attenuation ? Explain the process using the trp operon.

20. Describe the basic difference between cistron, recon and muton

21. Enlist the characteristic features of the genetic code.

22. Discuss the utility of PIR.

23. What is sequence alignment ? How do pair-wise and multiple sequence alignments differ from one another.

(5 × 6 = 30 marks)

Section C

Answer any **two** *questions.*
Each question carries 10 *marks.*

24. Illustrate and explain the fluid-mosaic model of the cell membrane.

25. Explain the differences between Central dogma and Teminism.

26. Highlight the significance of nucleotide databases in genome analysis.

27. Write an account on the human genome project.

(2 × 10 = 20 marks)

C 20236 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS–UG) DEGREE EXAMINATION, MARCH 2022

Plant Science

PLA 6B 11—BIOTECHNOLOGY

(2014 to 2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer *all* questions in one word/ Sentence :

1 What is a bio-reactor ?

2 Define Callus.

3 What is redifferentiation ?

4 What are primers ?

5 What is YAC ?

6 What is T-DNA ?

7 What *flavr savr* tomato ?

8 What is embryo rescue ?

9 Role of PEG in somatic cell fusion.

10 What is micro-injection ?

(10 × 1 = 10 marks)

Part B

II. Answer *all* questions. Each answers not exceeding 50 words :

11 Differentiate plasmids and cosmids.

12 A brief account on RACE.

13 What is *c* DNA library ?

14 What is Western blotting ?

15 Briefly explain the role of bio-technology in bio-remediation.

Turn over

16 What is somatic embryogenesis ?

17 Write a short note on ELISA.

18 Write an account on auxins.

19 Explain how micro propagation prevents viral transmission ?

20 Name *two* organic compound present in MS medium.

(10 × 2 = 20 marks)

III. Answer any *six* of the following. Each short essay not exceeding 150 words :

21 Explain the principles of reverse transcriptase PCR.

22 Briefly describe the sterilization procedure in plant tissue culture.

23 Explain the role of restriction endonucleases and lipases in *r*DNA technology.

24 Describe the advantages of vector mediated gene transfer.

25 Describe the production of secondary metabolites using bioreactors.

26 What are synthetic seeds ? Add a note on their applications.

27 What are the features of DNA fingerprinting and barcoding in plants ?

28 Explain the role of biotechnology in disease diagonosis.

(6 × 5 = 30 marks)

Part D

IV. Answer any *two* of the following. Each essay not exceeding 350 words :

29 Explain the direct methods of gene transfer and mention their advantages and disadvantages.

30 Explain the role of micro-propagation in crop improvement, secondary metabolite production and conservation.

31 Write an essay on molecular markers.

(2 × 10 = 20 marks)

C 20235 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS–UG) DEGREE EXAMINATION, MARCH 2022

Plant Science

PLA 6B 10—HORTICULTURE AND PLANT BREEDING

(2014 to 2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer *all* questions in one word/ Sentence :

1 Explain the term bio-fertilizer.

2 Write *one* example of plant propagated by leaf-bud cutting .

3 What is bonsai ?

4 Name *one* high yielding variety of coconut.

5 Define mutation.

6 Name *one* national level plant breeding institute.

7 Name *one* chemical test used for seed viability.

8 Name *two* indore plants.

9 What is hybrid vigour ?

10 What is mutation ?

(10 × 1 = 10 marks)

Part B

II. Answer *all* questions. Each answers not exceeding 50 words :

11 Explain the cultivation of okra.

12 Differentiate air layering and trench layering.

13 What is laterite soil ?

14 What is recalcitrant seed ? Give one example.

15 Write the names of *two* major pests of horticulture plants.

16 Name *two* seed germination media.

17 Explain plant introduction.

18 Name *two* branches of horticulture.

19 Write *two* objectives of plant breeding.

20 Explain breeding techniques in rice.

(10 × 2 = 20 marks)

Part C

III. Answer any *six* of the following. Each short essay not exceeding 150 words :

21 Write the significance of plant genetic resources.

22 What are the different types of landscaping ?

23 Explain the procedure of air layering.

24 Explain the method of mushroom cultivation.

25 Give an account of the seed treatments.

26 Write a short note on the care and maintenance of the indoor plants.

27 What are the different methods used for the induction of mutation in plants ?

28 Briefly explain cultivation and management of Orchids.

(6 × 5 = 30 marks)

Part D

IV. Answer any *two* of the following. Each essay not exceeding 350 words :

29 Give a brief account on the selection methods used in plant breeding.

30 Write an essay on the different types of propagation methods used in plants.

31 Give an account on the disease and pest control in horticultural plants.

(2 × 10 = 20 marks)

C 20234 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION MARCH 2022

Plant Science

PLA 6B 09—GENETICS, EVOLUTION AND ECOLOGY

(2014 to 2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer *all* questions in one word/sentence. Each question carries 1 mark :

1 Define test cross.

2 Define Genetics.

3 What are holandric genes ?

4 Name two green house gases.

5 What is migration ?

6 Define Hotspots.

7 What is Red data Book ?

8 Define lethal genes.

9 Expand UNEP.

10 Define Interference.

(10 × 1 = 10 marks)

Part B

II. Answer *all* questions. Each answer not exceeding 50 words. Each question carries 2 marks :

11 Distinguish between homozygosity and heteozygosity.

12 What do you mean by sex-linked inheritance ?

13 What are the adaptations found in xerophytes ?

14 What is the role of Kerala State Biodiversity Board ?

15 What do you mean by energy flow in an ecosystem ?

16 Describe the mutation theory of evolution.

17 Distinguish between autogenic and allogenic succession.

18 What is the contribution of T.H. Morgan ?

19 Distinguish between natality and mortality.

20 State the law of independent assortment.

(10 × 2 = 20 marks)

Part C

III. Answer any *six* of the following. Each short essay not exceeding 150 words. Each question carries 5 marks :

21 What do you mean by extranuclear inheritance ? Describe with an example.

22 Blood groups in man is a codominant character-explain.

23 Describe the sources of induced mutations.

24 Briefly explain the factors affecting genetic equilibrium.

25 Which are the factors influencing crossing over ?

26 Write short notes on Earth Summit.

27 What is the significance of speciation in evolution ?

28 Describe the chromosome theory of linkage.

(6 × 5 = 30 marks)

Part D

IV. Answer any *two* of the following. Each essay not exceeding 350 words. Each question carries 10 marks :

29 Explain the concept of organic evolution by citing evidences from various branches of Biology.

30 Describe the criss cross pattern of inheritance of eye colour in Drosophila with the help of diagrammatic illustration.

31 Discuss the harmful effects of non-biodegradable pollutants, suggest remedial measures and list out the legislations against this, in Indian scenario.

(2 × 10 = 20 marks)

C 20233 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, MARCH 2022

Plant Science

PLA 6B 08—CELL BIOLOGY, MOLECULAR BIOLOGY AND BIOINFORMATICS

(2014 to 2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer *all* questions in one word/ Sentence :

1 What is an autopolyploid ?

2 What is synapsis ?

3 Where do polytene chromosomes occur ?

4 Differentiate between centromere and centrosome.

5 What is a competent bacterial cell ?

6 Name the *three* stop codons.

7 What is transduction ?

8 Expand the term NCBI.

9 What is HUGO ?

10 What is an EST database ?

(10 × 1 = 10 marks)

Part B

II. Answer *all* questions. Each answers not exceeding 50 words :

11 What are the different types of chromosome structural aberrations ?

12 Why meiosis is called reduction division ?

13 Name the different types of histones along with their utility in nucleosome formation.

14 Describe the organization of the nuclear pore complex.

15 What is endomitosis ?

16 Describe the double helical form of DNA.

17 Highlight the contradiction in central dogma and Teminism.

18 How is processed mRNA produced ?

19 Provide a short description for any *two* protein structure databases.

20 What is the significance of sequence alignment ?

(10 × 2 = 20 marks)

Part C

III. Answer any *six* of the following. Each short essay not exceeding 150 words :

21 Describe the differences between the prokaryotic and eukaryotic chromosomes.

22 With the help of illustrations describe the ultrastructure of the mitochondria.

23 What is chromosome banding ? Explain the different types of banding techniques.

24 How does gene regulation mechanism occur in the operon system ?

25 What is wobble hypothesis ? Why the genetic code is considered degenerate ?

26 How is genome sequencing carried out ? Give examples for organisms whose genomes have been sequenced.

27 What are the different types of BLAST ? Describe the step-wise procedure.

28 Write a short note on protein structure databases and prediction.

(6 × 5 = 30 marks)

Part D

IV. Answer any *two* of the following. Each essay not exceeding 350 words :

29 Describe the sequence of events during the process of cell division. Highlight the differences in mitosis and meiosis.

30 Describe the process of DNA replication. Why is it considered semi-conservative ?

31 Discuss the utilities available at NCBI.

(2 × 10 = 20 marks)