C 21259 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Biotechnology

BTY4C15—ENVIRONMENTAL BIO-TECHNOLOGY

(2014—2018 Admissions)

Time : Three Hours Maximum : 64 Marks

Section A

Answer **all** *questions in a word* **or** *Phrase.*
Each question carries 1 *mark.*

1. Roundup.
2. Composting.
3. SCP.
4. Bioventing.
5. Mycor process.
6. Predominant organism found in trickling filters.
7. Arctic apples.
8. Crassulacean metabolism.
9. Rhizofiltration.
10. Green wall.

(10 × 1 = 10 marks)

Section B

Give short answer to any **seven** *out of ten questions.*
Each question carries 2 *marks.*

11. What is activated sludge ?
12. Vermicomposting Pit.
13. Sustainable Development.
14. Bio-gas.

Turn over

15. Oil spills.

16. Protoplast fusion.

17. Carbon sink.

18. Biological control agents.

19. Eutrophication.

20. PHA's.

(7 × 2 = 14 marks)

Section C

Answer in a paragraph any **four** *out of six questions.*
Each question carries 5 *marks.*

21. Stress tolerant plants.

22. Contribution of Carl Woese.

23. Gray Biotechnology.

24. Phytoextraction.

25. Limitations of Bioremediation.

26. Meganuclease.

(4 × 5 = 20 marks)

Section D

Write essays on any **two**.
Each question carries 10 *marks.*

27. With an example describe the making of GM crops.

28. Describe a Biogas plant. What are the advantages of using biogas.

29. Describe Nitrogen fixation.

30. How is Urban waste disposed of ?

(2 × 10 = 20 marks)

C 21258 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Biotechnology

BTY 4B 05—GENETICS

(2014—2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer any **two** *out of four questions in about* 1,500 *words.*
Each question carries 10 *marks.*

1. Explain Mendel's important Law's and discuss the merits and demerits of mendilian genetics.
2. Explain how gene transfer mechanisms help for bacterial genome analysis.
3. Describe the structure and organisation of chromosome.
4. Explain various factors that influence Hardy-Weinberg equilibrium.

(2 × 10 = 20 marks)

Section B

Answer any **seven** *out of fourteen questions in about* 750 *words.*
Each question carries 5 *marks.*

5. Discuss different theories regarding crossing over.
6. Explain the structure of Bacteriophage
7. Explain sex determination in Drsophila
8. Give a note on genotypic and allelic frequencies.
9. Give a note on Kappa particles in Paramecium.
10. Explain Cytoplasmic inheritance with suitable example.
11. Explain molecular evolution with suitable examples.
12. Explain the significance of crossing over and recombination.
13. Discuss modification of Mendel's dihybrid ratio.

Turn over

14. Discuss the characteristics of quantitative inheritance and how it differ from qualitative inheritance.

15. What is tetrad analysis ? Explain its application.

16. Discuss the genetic mapping of chromosome.

17. Write a note on special types of chromosome.

18. What is Karyotyping ? Explain different types of chromosome banding.

(7 × 5 = 35 marks)

Section C

Answer **all** *questions in about* 300 *words.*
Each questions carries 3 *marks.*

19. Extranuclear inheritance in prokaryotes.

20. Mendel's contributions to genetics.

21. What are the significance of polyploidy ?

22. Heterogametic males.

23. Describe Punnett's check board method.

(5 × 3 = 15 marks)

Section D

Answer **all** *questions in about* 200 *words.*
Each question carries 2 marks.

24. Penetrance.

25. Gene conversion.

26. Holandric gene.

27. Genetic drift.

28. Euchromatin and Heterochromatin.

(5 × 2 = 10 marks)

C 21513 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Biotechnology

BTY 4C 05—RECOMBINANT DNA TECHNOLOGY

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. What is Bt Brinjal ?
2. Define Vectors.
3. What are the features of pBR 322 ?
4. What is *gus* assay ?
5. What is Electroporation ?
6. What is South Western blotting ?
7. Comment on lambda replacement vectors ?
8. What is the use of alkaline phosphatase in cloning ?
9. What is *vir* DNA ?
10. What is triparental mating ?
11. What is meant by subunit vaccines ?
12. Comment on adenoviral vector vaccines ?

(8 × 3 = 24 marks)

Turn over

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Explain the co- integrate vector system of *Agrobacterium tumefaciens*.
14. What is Biolistics ? How is it advantageous in introducing foreign DNA into plant cells ?
15. Explain briefly the principle and procedure of Western blotting and hybridisation.
16. What is FISH ? Briefly explain its applications.
17. Explain the principle and procedure of Sanger's sequencing.
18. What are the applications of PCR ?
19. Explain the somatic nuclear transfer technology ?

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. What are the applications of transgenic plants ?
21. What is DNA fingerprinting ? How does it aid forensic investigations ?

(1 × 11 = 11 marks)

C 21512 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Biotechnology

BTY 4C 04—ENVIRONMENTAL BIOTECHNOLOGY

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Azolla.
2. Spirulina.
3. Bioherbicide.
4. *Bacillus thuringiensis.*
5. Biosparging.
6. Alcohol fuel.
7. Yeast as SCP.
8. Uses of GM plastics.
9. PHB.
10. Biodiversity hotspots.
11. Acidogenesis.
12. Bioscrubbers.

(8 × 3 = 24 marks)

Section B (Paragraph Type Questions)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. What is symbiotic nitrogen fixation ?
14. What are the advantages of biofuels ?
15. Describe the production of polylac.
16. What is baculovirus ? Comment on its use and significance.
17. What are phosphate solubilisers ?
18. Brief account on Bioventing.
19. Explain the production of uranium through bioleaching.

(5 × 5 = 25 marks)

Turn over

Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 *marks.*

20. Genetically modified organisms and their impact on Biodiversity.

21. Explain Biopower generation from Biomass.

(1 × 11 = 11 marks)

C 21511 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Biotechnology

BTY4B05—GENETICS

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer atleast **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall ceiling 30.

1. State Mendelian law of segregation.
2. Differentiate between genetic advance and heritability.
3. What is meant by genomic imprinting ?
4. What is holandric inheritance ?
5. What is euchromatin ?
6. What are Barr bodies ?
7. What are auxotrophic mutants ?
8. What is sexduction ?
9. What are transposons ?
10. What is allopatric speciation ?
11. What is meant by Cambrian explosion ?
12. Comment on molecular clock.
13. What are sex limited genes ?
14. What is adaptive radiation ?
15. What is the significance of pedigree analysis in human genetic disease characterisation ?

(10 × 3 = 30 marks)

Turn over

Section B

Answer atleast **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall ceiling 30.

16. What is law of dominance ? Explain with the help of a checker board. What are the exceptions to this law ?

17. What are the different numerical aberrations in chromosomes ?

18. What is genetic drift ? What is the influence of genetic drift on Hardy- Weinberg equilibrium ?

19. What is linkage ? What are the factors affecting recombination ?

20. What are the reasons for Mendel's success ?

21. What are the natural mechanisms of genetic transfer in bacteria ?

22. What is meant by haplo-diploidy mechanism of sex determination ? How does it differ from autosomal sex determination ?

23. What is karyotyping ? What are the different numerical aberrations in human fetuses leading to live birth ?

(5 × 6 = 30 marks)

Section C

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

24. State Hardy Weinberg law. What are the factors affecting Hardy- Weinberg equilibrium ?

25. Explain the inheritance of shell coilage in apple snail. How does this type of inheritance differ from the inheritance of leaf colour in Mirabilis ?

26. What are the different types of non allelic gene interactions ? Explain duplicate dominant epistasis with a suitable example.

27. What is meant by criss cross inheritance ? Explain with a suitable example.

(2 × 10 = 20 marks)

C 3515 **(Pages : 2)** **Name**.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Biotechnology

BTY 4C 05—RECOMBINANT DNA TECHNOLOGY

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. What is Humulin ?
2. Define recombinant DNA ?
3. What are shuttle vectors ?
4. What are selectable marker genes ?
5. What are telogenic nucleotides ?
6. What is FISH ?
7. Comment on pUC vectors.
8. What are thermostable polymerases ?
9. What is TDNA ?
10. What is Biolistics ?
11. What is meant by DNA vaccines ?
12. Comment on Golden Rice ?

(8 × 3 = 24 marks)

Turn over

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Explain the Binary vector system of *Agrobacterium tumefaciens*.
14. What is Electroporation ? How is it advantageous in introducing foreign DNA into bacillus ?
15. Explain briefly the principle and procedure of Northern blotting and hybridisation.
16. What is DNA finger printing ? Briefly explain its applications.
17. Explain the procedure of divalent cation mediated artificial transformation in *E. coli*.
18. What is the principle and procedure od alkali lysis procedure of plasmid isolation ?
19. What are the methods for creating transgenic mice ?

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. What are the applications of transgenic animals ?
21. PCR is an all-encompassing technique in applied life science research. Substantiate the statement.

(1 × 11 = 11 marks)

C 3514 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION APRIL 2021

Biotechnology

BTY 4C 04—ENVIRONMENTAL BIOTECHNOLOGY

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 marks.
All questions can be attended.
Overall Ceiling 24.

1 *Trichoderma viridae*

2 PLA

3 Bioventing

4 Prutase

5 Bioaugmentation

6 Cometabolism

Lignocellulose

8 Biosilica

9 Energy crops

10 Plant Secondary metabolites

11 Cry gene

12 Heap leaching

(8 × 3 = 24 marks)

Turn over

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Describe the production of GMO.
14. State the mechanism of action of thuringiensis toxin.
15. Explain methanogenesis and biogas production.
16. Explain the biological production of hydrogen.
17. Explain the production of uranium through bioleaching.
18. Give a brief account on viral biopesticides.
19. How bioderived poly ethylene is synthesized ?

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
Each question carries 11 *marks.*

20. Explain the strategies of bioremediation.
21. Write down an essay on biological nitrogen fixers.

(1 × 11 = 11 marks)

C 3513 **(Pages : 2)** **Name**.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Biotechnology

BTY 4B 05—GENETICS

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. State Mendelian law of dominance.
2. Differentiate between incomplete and complete penetrance.
3. What is meant by a pedigree ?
4. What are Aneuploids ?
5. What is Heterochromatin ?
6. What are lamp brush chromosomes ?
7. Comment on Ames test ?
8. What are F plasmids ?
9. What is a retrotransposon ?
10. What is sympatric speciation ?
11. What is meant by punctuated equilibria ?
12. Comment on bottleneck effect and founders effect.

(8 × 3 = 24 marks)

Turn over

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. What is law of independent assortment. Explain with the help of a checker board. What is the exception to this law ?

14. What are the different structural aberration in chromosomes. Explain in detail Robertzonian translocation.

15. What are the factors which deviate the Hardy- Weinberg equilibrium ?

16. What is sex linked inheritance ? Explain criss-cross inheritance with a suitable example.

17. How was Mendel's success influenced by the choice of experimental material ?

18. What are the different steps in linkage mapping of chromosomes ?

19. Comment on the sex determination mechanisms in mammals and Hymenopterans.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. What are the natural mechanisms of gene transfer in bacteria ?

21. Explain the inheritance of streptomycin resistance in Chlamydomonas. How do maternal inheritance and maternal effect differ ? Explain the difference between the two with suitable examples.

(1 × 11 = 11 marks)

C 2168 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION

APRIL 2021

Biotechnology

BTY 4C 15—ENVIRONMENTAL BIOTECHNOLOGY

Time : Three Hours Maximum : 64 Marks

Section A

Answer **all** *questions in a word* **or** *Phrase.*
Each question carries 1 *mark.*

1. Bioleaching.
2. Land fills.
3. Importance of Aspergillus niger.
4. Intrinsic bioremediation.
5. Algal fuel.
6. Use of hemicellulose.
7. Volatile organic chemicals.
8. Algal based biosensor.
9. Cell mass measurement.
10. PET.

(10 × 1 = 10 marks)

Section B

Give short answer to any seven out of **ten** *questions.*

11. Explain bioaugmentation.
12. How can we exploit solar energy ?
13. Describe Golden Rice.
14. What are probiotic foods.
15. What are uses of Chlorella sp ?

Turn over

16. How are herbicide resistant varieties made ?

17. How do we decontaminate soil ?

18. What is millennium developmental goals.

19. Honey crisp apple.

20. Genetically engineered disease resistant crops.

(7 × 2 = 14 marks)

Section C

Answer in **a paragraph** *any* **four** *out of six questions.*
Each question carries 5 *marks.*

21. Describe nitrification of soil.

22. What is enhanced biological phosphorous removal.

23. Explain the uses of plant tissue culture.

24. What are the uses of Bio electrochemical systems ?

25. How is waste water described ?

26. What are the problems caused by methane gas ?

(4 × 5 = 20 marks)

Section D

Write essays on any **two**.
Each question carries 10 *marks.*

27. What are industrial wastes ? What are the remedies ?

28. With examples describe the analytical tools used to monitor pollution

29. What is the methodology used to make stress tolerant varieties of plants

30. What is BT cotton ? How is It made ? What are the controversies about GM crops ?

(2 × 10 = 20 marks)

C 2167 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Biotechnology

BTY 4B 05—GENETICS

Time : Three Hours Maximum : 80 Marks

Section A

Answer any **two** *out of four questions in about* 1,500 *words.*
Each question carries 10 *marks.*

1. Explain the principles of Mendelian genetics.
2. Give an account of human inherited disorders.
3. Describe transformation in bacteria
4. Discuss speciation and its modes.

(2 × 10 = 20 marks)

Section B

Answer any **seven** *out of fourteen questions in about* 750 *words.*
Each question carries 5 marks.

5. Explain linkage with examples.
6. Describe pedigree analysis and its significance.
7. What is maternal effect ? Explain with an example.
8. What is a karyotype ? What is its significance ?
9. Give the features of human genome.
10. Give the principles of sex determination.
11. Describe the characteristics and importance of lampbrush chromosomes.
12. Explain the types of genomes in viruses.
13. Describe the methods for analysis of mutations.
14. What is generalized transduction ? Give its importance.

15. What are quantitative traits ? Explain with an example.

16. Explain molecular clock technique and its importance.

17. Describe Hardy-Weinberg equilibrium.

18. What is natural gene transfer ? Explain with respect to bacteria.

(7 × 5 = 35 marks)

Section C

Answer **all** *questions in about* 300 *words.*
Each question carries 3 *marks.*

19. What is extranuclear inheritance ?

20. Explain any *one* sex-linked human disorder.

21. What are Plasmids ?

22. What is a Hfr strain ?

23. What is a phylogenetic tree ?

(5 × 3 = 15 marks)

Section D

Answer **all** *questions in about* 200 *words.*
Each question carries 2 *marks.*

24. Epigenetic factor

25. Telomere.

26. Retrovirus

27. Multiple alleles.

28. Migration.

(5 × 2 = 10 marks)