K22N 0043

Reg. No. : .....

Name : .....

II Semester M.Sc. Degree (C.B.S.S. – Reg./Supple./Imp.) Examination, April 2022
(2020 Admission Onwards)
PLANT SCIENCE
PSB2C06 : Genetics, Plant Breeding and Biostatistics

Time : 3 Hours Max. Marks : 60

***Instruction** : Draw diagrams **wherever** necessary.*

SECTION – A

Answer **any two** questions, **one** from **each** bunch. **(2×8=16)**

1. A) Give a detail account on the inborn errors of metabolism in Man.

   OR

   B) Explain Hardy-Weinberg law of equilibrium and the factors affecting the allelic frequencies.

2. A) Define polyploidy. Explain induction of polyploidy and chromosome manipulation in polyploidy breeding.

   OR

   B) Give a detailed account on measures of variation, its merits and demerits.

SECTION – B

Answer **any three** questions. **(3×5=15)**

3. Give a detail description on quantitative inheritance with two examples.
4. Discuss tetrad analysis in Neurospora.
5. Discuss the necessity of plant introduction and its significance.
6. Describe different types of experimental designs.
7. Give a brief account on different types of Tests of Significance.

P.T.O.

SECTION – C

Answer **any five** questions. **(5×3=15)**

8. Give a note on viral oncogenes.
9. What are the steps involved in constructing a gene map.
10. Briefly explain pedigree analysis in humans.
11. Write a short note on Ac/Ds system in maize.
12. What do you mean by centres of genetic diversity ?
13. What are the major achievements in plant breeding ?
14. Differentiate correlation and regression.
15. Explain different types of probability in genetics.

SECTION – D

Answer **any seven** questions. **(7×2=14)**

16. Explain coupling & repulsion.
17. What is the peculiarity of circadian clock ?
18. Stern's hypothesis.
19. Why is *Arabidopsis thaliana* important for research ?
20. Differentiate eugenics, euphenics and euthenics.
21. What is Heterosis ?
22. Explain Gene banks.
23. Expand and explain ANOVA.
24. What is Randomized block design ?
25. Describe Pearson's correlation coefficient.

K22N 0043

Reg. No. : .....

Name : .....

II Semester M.Sc. Degree (C.B.S.S. – Reg./Supple./Imp.) Examination, April 2022
(2020 Admission Onwards)
PLANT SCIENCE
PSB2C06 : Genetics, Plant Breeding and Biostatistics

Time : 3 Hours Max. Marks : 60

***Instruction** : Draw diagrams **wherever** necessary.*

SECTION – A

Answer **any two** questions, **one** from **each** bunch. **(2×8=16)**

1. A) Give a detail account on the inborn errors of metabolism in Man.

   OR

   B) Explain Hardy-Weinberg law of equilibrium and the factors affecting the allelic frequencies.

2. A) Define polyploidy. Explain induction of polyploidy and chromosome manipulation in polyploidy breeding.

   OR

   B) Give a detailed account on measures of variation, its merits and demerits.

SECTION – B

Answer **any three** questions. **(3×5=15)**

3. Give a detail description on quantitative inheritance with two examples.
4. Discuss tetrad analysis in Neurospora.
5. Discuss the necessity of plant introduction and its significance.
6. Describe different types of experimental designs.
7. Give a brief account on different types of Tests of Significance.

P.T.O.

SECTION – C

Answer **any five** questions. **(5×3=15)**

8. Give a note on viral oncogenes.
9. What are the steps involved in constructing a gene map.
10. Briefly explain pedigree analysis in humans.
11. Write a short note on Ac/Ds system in maize.
12. What do you mean by centres of genetic diversity ?
13. What are the major achievements in plant breeding ?
14. Differentiate correlation and regression.
15. Explain different types of probability in genetics.

SECTION – D

Answer **any seven** questions. **(7×2=14)**

16. Explain coupling & repulsion.
17. What is the peculiarity of circadian clock ?
18. Stern's hypothesis.
19. Why is *Arabidopsis thaliana* important for research ?
20. Differentiate eugenics, euphenics and euthenics.
21. What is Heterosis ?
22. Explain Gene banks.
23. Expand and explain ANOVA.
24. What is Randomized block design ?
25. Describe Pearson's correlation coefficient.

K23N 0143

Reg. No. : .....

Name : .....

II Semester M.Sc. Degree (CBSS – Reg./Supple./Imp.) Examination, April 2023
(2019 Admission Onwards)
PLANT SCIENCE
PSB2C06 : Genetics, Plant Breeding and Biostatistics

Time : 3 Hours Max. Marks : 60

***Instruction** : Draw diagrams **whenever** necessary.*

SECTION – A

Answer **any two** questions, **one** from **each** bunch. **(2×8=16)**

1. Write in detail about mapping in bacteria.

   OR

   Write notes on sex linked inheritance with special reference to sex linked lethal mutations.

2. Write in detail about the steps to be followed in mutation breeding programme. Add a note on various physical and chemical mutagens.

   OR

   Write the different methods for the diagrammatic and graphic representation of data.

SECTION – B

Answer **any three** questions. **(3×5=15)**

3. Comment on maternal inheritance with *Mirabilis Jalapa* as an example.

4. How is three-point test cross data used for calculation of the distance between genes ?

5. Write notes on the asexual methods of plant propagation.

6. What is ANOVA ? State its importance.

7. Give an account on the various measures of dispersion.

P.T.O.

SECTION – C

Answer **any five** questions. **(5×3=15)**

8. Give an account on multiple factor inheritance.
9. Comment on the genetics of Mammalian clock.
10. Give an account of inborn errors of metabolism in human.
11. What are the factors that change gene frequencies in a population ?
12. How mass selection is practiced ?
13. Comment on interspecific hybridization.
14. Write notes on correlation and regression.
15. Write on the multiplication theorem of probability.

SECTION – D

Answer **any seven** questions. **(7×2=14)**

16. What are Barr bodies ?
17. Define the law of independent assortment.
18. Comment on bottle neck effect.
19. Comment on transgressive variation.
20. What are nomadic genes ?
21. Differentiate domestication and acclimatization.
22. What is emasculation ?
23. Define variance. How is it calculated ?
24. What is pie diagram ?
25. Comment on RBD.

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K22N 0044

Reg. No. : .....

Name : .....

II Semester M.Sc. Degree (C.B.S.S. – Reg./Supple./Imp.) Examination, April 2022
(2020 Admission Onwards)
PLANT SCIENCE
PSB2C07 : Evolution, Microtechnique and Instrumentation

Time : 3 Hours Max. Marks : 60

***Instruction** : Draw diagrams **wherever** necessary.*

SECTION – A **(2×8=16)**

Answer **any two** questions, **one** from **each** bunch.

1. A) Give a detailed account on natural selection. Explain the factors affecting it.

   OR

   B) Explain the principles of staining. Give the classification of stains and staining.

2. A) Give an account on various methods used for the study of DNA polymorphism.

   OR

   B) Describe the principle, parts, working and applications of
   a) NMR
   b) GC-MS.

SECTION – B **(3×5=15)**

Answer **any three** questions.

3. Explain the process of dehydration and its significance in tissue fixation process.
4. Discuss about the various aspects of speciation.
5. Write an account on X-ray diffraction.
6. Give a brief account on immunoelectrophoresis.
7. Explain Sanger's DNA sequencing.

P.T.O.

SECTION – C (5×3=15)

Answer **any five** questions.

8. Give a brief account on mechanism of fossilization.
9. Explain macro and micro evolution.
10. Give embryological evidences for evolution.
11. Write down the working of a rotary microtome.
12. How will you prepare FAA ? Explain the composition and properties.
13. What is autoradiography ?
14. What is Lyophilization ? Mention its applications.

SECTION – D (7×2=14)

Answer **any seven** questions.

15. Give endosymbiont theory.
16. What is Punctuated equilibrium ?
17. Significance of Eugenics.
18. Write down two examples of natural stains.
19. What do you mean by a smear ?
20. What is Rf value ? How will you calculate it ?
21. Mention the applications of HPLC.
22. Write a note on micrometry.
23. What is an ultracentrifuge ?
24. What is Cryobiology ?

K23N 0144

Reg. No. : .....

Name : .....

II Semester M.Sc. Degree (C.B.S.S. – Reg./Supple./Imp.)
Examination, April 2023
(2019 Admission Onwards)
PLANT SCIENCE
PSB2C07 : Evolution, Microtechnique and Instrumentation

Time : 3 Hours Max. Marks : 60

***Instruction** : **Draw** diagrams **wherever** necessary.*

SECTION – A

Answer **any two** questions ; **one** from **each** bunch. **(2×8=16)**

1. A) Explain the different modes and types of speciation.

   OR

   B) Discuss in detail about the various steps for a permanent slide preparation in a histological study.

2. A) Write an explanatory account on blotting techniques.

   OR

   B) Describe the different types of chromatography.

SECTION – B

Answer **any 3** questions. **(3×5=15)**

3. Describe natural selection and the significance of genetic drift in natural selection.

4. What are the different methods for histochemical localization of starch, lipids and lignin ?

5. Give a descriptive account on PCR, different types of PCR and their applications.

6. Write in detail about the different types of electrophoresis.

7. Explain the different types of microscopes used in biological research.

P.T.O.

SECTION – C

Answer **any 5** questions. **(5×3=15)**

8. Write about the geological evidences of evolution.
9. Briefly describe the different modes of speciation.
10. Give an account on hybridization and introgression in evolution of species.
11. Write an account on Kin's selection and Hamilton's rule.
12. Write an explanatory account on whole mounting.
13. What is maceration? Explain various maceration techniques.
14. Write in detail about Maxam and Gilbert method of DNA sequencing.
15. Explain briefly about GM counting and scintillation counting.

SECTION – D

Answer **any 7** questions. **(7×2=14)**

16. Define eugenics.
17. Differentiate between Batesian and Mullerian mimicry.
18. Write about Miller-Urey experiment.
19. List out the properties of a good fixative.
20. What is clearing in microtechnique ? Why it is carried out ?
21. What are natural stains ? Mention two examples and their sources.
22. What is the principle of chromatography ?
23. Give a brief note on autoradiography.
24. Write an account on MALDI-TOF.
25. What is cryoelectron microscope ? What is its use ?

K24N 0126

Reg. No. : .....

Name : .....

Second Semester M.Sc. Degree (CBSS – Reg./Supple./Imp.) Examination, April 2024
(2021 Admissions Onwards)
PLANT SCIENCE
PSB2C07 : Evolution, Microtechnique and Instrumentation

Time : 3 Hours Max. Marks : 60

Instruction : ***Draw*** *diagrams* ***wherever*** *necessary.*

SECTION – A

Answer **any two** questions; **one** from **each** bunch.

1. A) Discuss the concept of speciation in evolutionary biology.

   OR

   B) Discuss the principles, techniques and the significance of whole mounts in histological analysis.

2. A) Compare and contrast paper chromatography and ion exchange chromatography.

   OR

   B) Discuss the principles and applications of different biophysical methods used for analyzing biopolymer structure. **(2×8=16)**

SECTION – B

Answer **any three** questions.

3. Discuss the significance of mutation as an evolutionary force in shaping genetic diversity within populations.

4. Describe geological time scale.

5. Describe the process of embedding in plant histology.

6. Explain the method of histochemical localization of starch and lignin.

7. Discuss the principle and applications of flow cytometry. **(3×5=15)**

P.T.O.

SECTION – C

Answer **any five** questions :

8. Explain the concept of co-evolution and provide examples.
9. Discuss different types of fossils.
10. Explain Kin Selection and Hamilton's Rule in the context of evolutionary biology.
11. Explain the importance of fixation images in plant histology.
12. Discuss the techniques of sectioning in rotary microtomes.
13. Outline the steps involved in the Safranine-Fast green staining method.
14. Describe the principle of phase contrast microscopy and its applications.
15. Explain Pulse Field Gel Electrophoresis. **(5×3=15)**

SECTION – D

Answer **any seven** questions.

16. Describe the Oparin-Haldane theory of chemical evolution.
17. Define genetic drift.
18. What are sub-climax and climax dispersal.
19. Differentiate between smear and squash techniques used in histological sample preparation.
20. What is the significance of triple staining in histological sample analysis ?
21. What is the function of a cryotome in sectioning histological samples ?
22. What is autoradiography used in biological research ?
23. Describe the principle of PCR and name one variation of PCR used for quantitative gene expression analysis.
24. Define immunofluorescence.
25. What is the function of an objective lens in a microscope ? **(7×2=14)**

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K22N 0045

Reg. No. : .....

Name : .....

II Semester M.Sc. Degree (C.B.S.S. – Reg./Supple./Imp.) Examination, April 2022
(2020 Admission Onwards)
PLANT SCIENCE
PSB2C08 : Microbial and Plant Biotechnology

Time : 3 Hours Max. Marks : 60

***Instruction** : Draw diagrams **wherever** necessary.*

SECTION – A

Answer **any two** questions **one** from **each** bunch. **(2×8=16)**

1. A) Give a detailed account on various types of bioreactors and their use in bioprocess technology.

   OR

   B) Explain in detail the various direct and indirect methods of gene transfer in plants.

2. A) Give an account on the organization of tissue culture laboratory. Add a note on the aseptic techniques in tissue culture practice.

   OR

   B) Write an essay on biological synthesis of nanoparticles using plants and microbes.

SECTION – B

Answer **any three** questions. **(3×5=15)**

3. Describe the various enzymes used in recombinant DNA technology.
4. Write an account on Rhizobacterial inoculants and their uses.
5. What are Ti and Ri plasmids ? Why are they important in genetic engineering ?
6. What are the advantages and disadvantages of genetically modified organisms ?
7. What is suspension culture ? What are its advantages ?

P.T.O.

SECTION – C

Answer **any five** questions. **(5×3=15)**

8. What is SCP ? Explain the use of microbes for its production.
9. What are BAC and YAC ?
10. What is the use of *Agrobacterium tumifaciens* in biotechnology ?
11. What are selectable markers and how are they useful in an ideal vector ?
12. What is callus culture and its advantages ?
13. Describe the steps involved in the production of synthetic seeds.
14. What are quantum dots ?
15. Write a note on the application of nanobiosensors.

SECTION – D

Answer **any seven** questions. **(7×2=14)**

16. Cosmids.
17. Reverse transcriptase.
18. T-DNA.
19. GMMs.
20. Intellectual Property Rights.
21. Subculture.
22. Meristem culture.
23. Somaclonal variation.
24. Nanotubes.
25. 'Lab on a chip' concept.

K23N 0145

Reg. No. : .....

Name : .....

II Semester M.Sc. Degree (CBSS – Reg./Supple./Imp.) Examination, April 2023
(2019 Admission Onwards)
PLANT SCIENCE
PSB2C08 : Microbial and Plant Biotechnology

Time : 3 Hours Max. Marks : 60

Instruction : *Draw diagrams* ***whenever*** *necessary.*

SECTION – A

Answer **any two** questions, **one** from **each** bunch. **(2×8=16)**

1. Write in detail about the industrial application of microorganisms.

   OR

   Write notes on the methods of direct gene transfer in plants.

2. Give a brief account on agrobacterium mediated gene transfer.

   OR

   Narrate the importance and applications of nano biosensors.

SECTION – B

Answer **any three** questions. **(3×5=15)**

3. What are the different types of restriction endonucleases ?

4. How a genomic library can be constructed ?

5. Briefly explain the procedure and applications of protoplast culture.

6. Describe the importance of IPR.

7. Give an account on the applications of cell suspension culture.

P.T.O.

SECTION – C

Answer **any five** questions. **(5×3=15)**

8. Differentiate BAC and YAC.
9. Give an account on the advantages of the solid state fermentation over the submerged fermentation.
10. Comment on the advantages and disadvantages of Bt cotton.
11. Write notes on any two selectable markers for plant transformation.
12. Give the importance of somatic embryogenesis.
13. What are the importance of somaclonal variation ?
14. Give the any method for the synthesis of Ag nano particles.
15. Comment on the applications of nanobiotechnology in medicine.

SECTION – D

Answer **any seven** questions. **(7×2=14)**

16. What are ligases ?
17. What are SCPs ?
18. What are Ri plasmids ?
19. Comment on Glyphosate.
20. What are *flavr savr* tomatoes ?
21. What is dedifferentiation ? How is it different from redifferentiation.
22. What are elicitors ?
23. Write notes on PEG.
24. What are nanomaterials ?
25. Comment on quantum dots.

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