TDP (Honours) 1st Semester Exam., 2014

BOTANY

(Honours)

FIRST PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. What were the basic chemicals from which life is thought to have formed? What was the atmospheric condition of earth four billion years ago? What is RNA world hypothesis? State the evidences in support of this idea. 3+2+2+3=10

2. What do you understand by Natural System of Classification? Give a brief outline of the natural system of classification studied by you up to series. Mention the characters of the different classes and sub-classes. 2+4+4=10

3. What is speciation? Distinguish between sympatric speciation and allopatric speciation. Add a note on role of isolation in speciation. 2+3+5=10

UNIT—II

4. Define pollution. What do you mean by non-degradable and biodegradable pollutants? Mention the major sources of soil pollution. Write a brief note on health hazards of noise pollution. 1+2+4+3=10

5. Mention the sources of water pollution. State how industrial and thermal water pollution effects living organisms. 3+4+3=10

6. Write short notes on *(a)* greenhouse effect and *(b)* photochemical smog. What is the significance of ozone umbrella? 4+4+2=10

UNIT—III

7. What is organic farming? What is the difference between commercial chemical fertilizers and organic fertilizers? State the advantages of organic farming. 2+3+5=10

8. Name two fungi species which are used in commercial production of ethyl alcohol. Write a note on *Spirulina* culture technique. Mention the nutritional value of *Spirulina*. 2+5+3=10

9. What is spawn? How is it prepared? Mention the requirements for cultivation of oyster mushroom. Describe in brief the cultivation process of oyster mushroom. 1+2+3+4=10

UNIT—IV

10. What is plant nursery? Differentiate between temporary nursery and permanent nursery. What are the infrastructures required for establishing a ornamental plant nursery? 2+3+5=10

11. What is layerage? How does it differ from cuttage? Explain the following types of layerage : 2+2+(2×3)=10

    (a) Tip layering

    (b) Trench layering

    (c) Air layering

12. What is grafting? Differentiate between stone grafting and approach grafting. In what respect grafting differs from budding? Describe the technique of T-budding. 2+3+1+4=10

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TDP (Honours) 1st Semester Exam., 2015

BOTANY

(Honours)

FIRST PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. Discuss the hypothesis on origin of life in earth. What are the differences between prokaryotes and eukaryotes? Add a short note on three domains of classification. 5+2+3=10

2. Distinguish between macro- and micro-evolution. Who proposed the theory of natural selection? Write short note on 'struggle for existence' and 'survival of the fittest'. 3+1+3+3=10

3. Define 'alteration of generation' with schematic representation. Describe the haplodiplobiontic life cycle pattern citing suitable example. Mention the merits of APG system of classification. 2+5+3=10

UNIT—II

4. What is the difference between photochemical smog and classical smog? Mention the types and major sources of air pollution. State the effect of air pollution on plants. 2+2+2+4=10

5. Write short notes on *(a)* types of ozone depleting chemicals and *(b)* global warming. What are the sources of radioactive pollution? 4+4+2=10

6. What do you understand by bioremediation? How does metals in the soil affect plants? Write a note on noise pollution. 2+4+4=10

UNIT—III

7. Write the full forms of ICAR and NSC. What are 'breeder seeds' and 'foundation seeds'? Add a note on effective seed marketing. 1+1+2+2+4=10

8. What is antibiotic? Give two examples of antibiotic-producing microorganisms. Give an account on commercial production of ethyl alcohol. What is single cell protein? 1+2+5+2=10

9. Why do we need biofuels? Write a short note on biodiesel. Add a note on the benefits and drawbacks to biofuel energy. 2+4+4=10

UNIT—IV

10. What is nursery bed? Mention the different types of nursery bed used for propagation purpose. What are the infrastructures required for establishing a medicinal plant nursery? 2+3+5=10

11. Mention the advantages of grafting. Write note on the natural vegetative propagation method citing suitable examples. What is scarification? 3+5+2=10

12. What is floriculture? Mention the important floriculture crops. Write a brief note on open cultivation practices. 2+3+5=10

★★★

11. Briefly explain the artificial vegetative propagation method. Mention the advantages and limitations of vegetative propagation. What is stratification? 5+(2+2)+1=10

12. What are low-cost nursery techniques? Mention the advantages and limitations of this technique. What are the components of a standard greenhouse? 3+(2+1)+4=10

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TDP (Honours) 1st Semester Exam., 2016

BOTANY

(Honours)

FIRST PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. Describe the structure of an ideal plant cell with suitable diagram. Compare between plant cell and animal cell. 4+(2+1)+3=10

2. What is phylogenetic system of classification? Describe a phylogenetic system of classification with its merits and demerits. 2+4+4=10

3. Discuss in brief allopatric and sympatric speciations with examples. Write the role of postzygotic solution in speciation. Who proposed 3-domain system of classification? (2+1)+(2+1)+3+1=10

UNIT—II

4. Write the types of water pollution. What are the general impacts of water pollution on human health? Write a short note on the control measures against ozone hole. What is acid rain? 2+4+2+2=10

5. What are the sources and impact of noise pollution on human health? Write a note on heavy metal pollution. Which metal causes 'Blackfoot' disease in human? 2+3+4+1=10

6. Mention the major sources of soil pollution. What are the point and non-point sources of water pollution? Write a note on the impact and control measures of radioactive pollutants on human health/ecosystem. 2+(2+2)+(2+2)=10

UNIT—III

7. What do you understand by organic farming? What is the need of organic farming? Mention the types of organic fertilizer used in an organic farm. What are the advantages and limitations of organic farming? 2+2+2+2+2=10

8. Write a note on the importance of seed industry. Discuss in brief the mechanism of seed processing. What are the essential steps involved in *Spirulina* culture? 3+4+3=10

9. Write, in brief, the process of mushroom culture as studied by you. Comment on its food value. Write the scientific name of one edible and one poisonous mushrooms. 4+2+2+2=10

UNIT—IV

10. What are the infrastructures involved in the setup of an ornamental plant nursery? Write a note on the commercial application of fruit plant nursery. Mention the scientific names of three important orchids with their uses. 5+2+3=10

11. With suitable example, describe the different types of grafting known to you. Explain the process of 'T' budding with an example. Name one plant suitable for air-layering. 5+(3+1)+1=10

12. Write a note on important floricultural crops. Describe the open cultivation practice. Suggest marketing strategy for floricultural crops. 3+4+3=10

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TDP (Honours) 1st Semester Exam., 2017

BOTANY

(Honours)

FIRST PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. Name the important theories of origin of life. Describe briefly modern/naturalistic/chemo-synthetic heterotrophs theory of origin of life as proposed by Oparin and Haldane. Add a note on the Urey and Miller experiment. Which Era or Epoch is known as the Age of Angiosperms? 2+4+3+1=10

2. What is natural system of classification? Describe Bentham and Hooker system of classification. Mention its merits and demerits. 1+5+2+2=10

3. Discuss in brief the three domain system of classification. Give the geological time table of plant evolution. Write the role of isolation mechanism in speciation. 3+4+3=10

UNIT—II

4. What are primary and secondary polutants? Write a short note on the types with sources of air pollutants and their effects on plants and animals. Which pollutant is responsible for the depletion of ozone layer? (1+1)+3+(2+2)+1=10

5. Write a note on effect of greenhouse gasses on global warming. What is the significance of ozone umbrella? How is ozone hole created? What is photochemical smog? How is it formed? 3+2+2+1+2=10

6. What is noise pollution? Mention the sources of noise pollution. Discuss the effects of noise pollution. Mention the effects of acid rain on ecosystem. 2+3+3+2=10

UNIT—III

7. What are the various strategies employed for seed marketing? What are the differences between breeder seed and certified seed? Describe the steps to be taken during seed production in the field. 3+(2+2)+3=10

8. Describe ethyl alcohol production on commercial scale. Briefly describe the importance of biofuel in modern times. Give the scientific name of two plants which are involved in the production of biofuel (one each for bio-alcohol and bio-diesel producing plants). 5+3+(1+1)=10

9. Name two microorganisms responsible for making vinegar. Describe the process of production of vinegar. Write a short note on the production of penicillin. 2+5+3=10

UNIT—IV

10. What are the infrastructure involved in the setup of a vegetable plant nursery? Write notes on the commercial application of medicinal plant nursery and orchid nursery. 4+(3+3)=10

2. What is natural system of classification? Describe Bentham and Hooker system of classification. Mention its merits and demerits. 1+5+2+2=10

3. Discuss in brief the three domain system of classification. Give the geological time table of plant evolution. Write the role of isolation mechanism in speciation. 3+4+3=10

UNIT—II

4. What are primary and secondary polutants? Write a short note on the types with sources of air pollutants and their effects on plants and animals. Which pollutant is responsible for the depletion of ozone layer? (1+1)+3+(2+2)+1=10

5. Write a note on effect of greenhouse gasses on global warming. What is the significance of ozone umbrella? How is ozone hole created? What is photochemical smog? How is it formed? 3+2+2+1+2=10

6. What is noise pollution? Mention the sources of noise pollution. Discuss the effects of noise pollution. Mention the effects of acid rain on ecosystem. 2+3+3+2=10

UNIT—III

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9. Name two microorganisms responsible for making vinegar. Describe the process of production of vinegar. Write a short note on the production of penicillin. 2+5+3=10

UNIT—IV

10. What are the infrastructure involved in the setup of a vegetable plant nursery? Write notes on the commercial application of medicinal plant nursery and orchid nursery. 4+(3+3)=10

TDP (Honours) 1st Semester Exam., 2018

BOTANY

(Honours)

FIRST PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. What is Darwinism? Explain the concept 'struggle for existence' with emphasis on Darwinism. Write the limitations of Darwinism. 3+4+3=10

2. Write in brief about allopatric and sympatric speciation with examples. What is alternation of generation? With example, describe the haplodiplobiontic life cycle pattern with schematic representation. (1½+1½)+1+(1+4+1)=10

3. What is artificial system of classification? Who proposed this system of classification? How does it differ from phylogenetic system of classification? Give an outline of artificial system of classification by Linnaeus. 2+1+2+5=10

UNIT—II

4. What are the sources of soil pollution? Write the effects of soil pollution on human health. How do metals in the soil affect plants? 3+3+4=10

5. What is water pollution? Mention the sources of water pollution. Write a note on the effect of water pollution on plants and animals. 1+3+(3+3)=10

6. What are the sources of radioactive pollution? Mention the measures to reduce radioactive pollution. What is PAN? What is the unit to measure sound pollution? What is CFC? How is acid rain formed? 2½+2½+1+1+1+2=10

UNIT—III

7. What is the need of organic farming? Write about different types of organic fertilizers used in the farming. Mention the advantages and limitations of organic farming. 2+3+(2½+2½)=10

8. What is SCP? Briefly describe the method of cultivation of *Spirulina*. Mention the nutritional value of *Spirulina*. Name one Indian species of *Spirulina*. 2+5+2+1=10

9. Describe the steps of spawn production for the cultivation of Pleurotus mushroom. Write the nutritional value of paddy straw mushroom. Write the scientific name of one poisonous mushroom. Write about the preservation method of mushrooms. 5+2+1+2=10

UNIT—IV

10. Mention the qualities of a good selection site for establishing a nursery. Mention the commercial applications of fruit plant nursery and vegetable plant nursery. Write scientific names of two ornamental plants. 3+2½+2½+2=10

11. Describe different types of human-aided layering. How do layering and pruning differ from grafting? What is inverted T-budding? 5+3+2=10

12. What is floriculture? Write about harvesting of floricultural crops. Mention the advantages and limitations of vegetative propagation. 2+4+(2+2)=10

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TDP (Honours) 1st Semester Exam., 2019

BOTANY

(Honours)

FIRST PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. What is life? Briefly describe the theory of chemical evolution or abiogenic synthesis for origin of life. Explain the Miller and Urey's experiment in support of Oparin and Haldane hypothesis. Differentiate between archaea and bacteria. 1+4+3+2=10

2. What do you mean by phylogenetic system of classification? Briefly describe the phylogenetic system of classification with its division characters. Define alternation of generation. What is 'Cryptogamia? 2+5+1+2=10

3. Distinguish between macro- and micro-evolution. Add a note on the role of isolation in speciation. Mention the differences between sympatric and allopatric speciation. 2+5+3=10

UNIT—II

4. What is pollution? What do you mean by biodegradable and non-biodegradable pollutants? Mention the major sources of sound pollution. Write a brief note on health hazards of noise pollution. 2+2+3+3=10

5. What is bioremediation? Mention the types and major sources of air pollution. State the effect of soil pollution on plants. 2+(2½+2½)+3=10

6. Write short notes on the following : 3+4+3=10

   (a) Greenhouse effect

   (b) Types of ozone depleting chemicals and their interactions

   (c) Photochemical smog

UNIT—III

7. What are the differences between nuclear seed and breeder seed? Write the full forms of ICAR and NSC. Add a note on the production of certified seeds. 3+2+5=10

8. What is penicillin? Describe the process of penicillin production. Name two micro-organism used for citric acid production. With the help of a flowchart, mention the process of citric acid production. Why is lime ($CaOH_2$) used in citric acid production? 1+4+2+2+1=10

9. What is the need of organic farming? Mention benefits and drawbacks of biofuel energy. Why are biofuels needed? What is spawn? 2+(2+2)+2+2=10

UNIT—IV

10. Mention the infrastructure involved in the setup of a medicinal plant nursery. Describe the commercial application of ornamental plant and orchid nursery. 4+(3+3)=10

11. What do you mean by seed propagation? Describe the natural vegetative propagation briefly with examples. Mention the limitations of vegetative propagation. 1+(4+3)+2=10

12. Give the binomials of two important floricultural crop. Describe the open cultivation practice. Write a note on marketing of floricultural crops. 2+5+3=10

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TDP (Honours) 1st Semester Exam., 2021
(Held in 2022)

BOTANY

(Honours)

FIRST PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

UNIT—I

1. Define biological species. What is natural selection? Briefly explain the role of natural selection in the origin of new species. Why RNA is considered to be the first living molecule rather than proteins? 2+2+4+2=10

2. What is Haldane's soup? Characterize the domain Archaea. Discuss the types of triphasic life cycle with schematic diagram. What do you mean by microevolution? 2+3+4+1=10

3. What is natural system of classification? Give the outline classification of Bentham and Hooker's system. Mention the merits of this system of classification. What is haplobiontic life cycle? 2+4+2+2=10

UNIT—II

4. Mention the major sources of water pollution. What is eutrophication? Mention the harmful effects of mercury (Hg) on human health. What is BOD? 4+2+2+2=10

5. Define primary and secondary air pollutants with examples. Why does increased concentration of CO_2 in the atmosphere lead to temperature rise? Add a note on harmful effects of CO and SO_2 on human health. What is acidification of precipitation? 2+2+(2+2)+2=10

6. Mention various sources of radioactive pollution. Write the negative effects of such pollution. What is salinization of soil? How is ozone hole formed? 3+3+2+2=10

UNIT—III

7. What is SCP? Discuss the method of *Spirulina* cultivation. Name one Indian species of *Spirulina*. Write the important features of organic farming. 2+5+1+2=10

8. What is biofermentation? Write the biochemical basis of production of ethanol by yeasts. How ethanol is purified? What is semisynthetic penicillin? How does penicillin kill bacteria? 2+2+2+2+2=10

9. Give the botanical definition of a seed. Mention the characteristics of good quality seed. Briefly describe the various steps of seed processing. What is foundation seed? 2+3+3+2=10

UNIT—IV

10. Why are seed propagated plants genetically different from mother plants? What is vegetative propagation? What are the advantages of vegetative propagation? Characterize 'bulb' and 'tuber' with example. 2+2+3+(2+1)=10

11. What is plant nursery? Mention the important criteria for site selection for construction of plant nursery. Write the advantages of raising plants in a nursery. What do you mean by dry nursery and wet nursery? 2+3+3+2=10

12. What is cutting? How does it differ from layering? What influence does girdling have on root formation during layering? Define rootstock, scion and interstock. What is graft incompatibility? 2+2+2+3+1=10

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TDP (Honours) 2nd Semester Exam., 2015

BOTANY

(Honours)

SECOND PAPER

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. Write the thallus organization of multicellular algae. Describe in brief the ultrastructure of plastid of algae with diagrams. 6+6=12

2. Mention the salient features of Chlorophyceae. Comment on androspore. "The life cycle pattern of *Polysiphonia* is triphasic." Explain. 4+2+6=12

3. Why are bryophytes considered as amphibian plants? Mention briefly antithetic theory in connection with alternation of generation of bryophytes. Describe briefly the successive stages in the development of sporophyte of *Riccia*. 2+5+5=12

UNIT—II

4. Draw and describe the internal organization of the internode of aerial stem of *Equisetum*. Mention the xerophytic characters of *Equisetum*. State the merits of Telome theory. (2+4)+3+3=12

5. Describe the development of male gametophyte of *Pinus* with suitable diagrams. How does its development differ from that of *Cycas* sp? Mention the criteria for seed-habit development. (4+2)+2+4=12

6. What is index fossil? Discuss different modes of preservation of fossils citing suitable examples. Add a note on Lyginopteris. 2+6+4=12

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TDP (Honours) 2nd Semester Exam., 2016

BOTANY

(Honours)

SECOND PAPER

(Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. What are pyrenoids? Describe the cell structure of diatom with suitable diagrams. Add a note on the economic importance of algae. 2+(4+2)+4=12

2. Enumerate the different types of spores found in the life cycle of Vaucheria. Describe its sexual reproduction with neat sketches. What is Palmella stage? 2+(5+2)+3=12

3. What is gemmae cup? With suitable diagrams, give a brief account of the progressive theory of evolution in the sporophytes of Bryophyta. 2+(4+6)=12

UNIT—II

4. Describe the internal structure of *Selaginella* stem with diagram. Describe the spore-bearing structure of *Pteris* with suitable illustrations. (4+2)+(4+2)=12

5. Classify 'Gondwana', following three-fold division. Describe the floral assemblage of Lower Gondwana. Why is *Rhynia gwynne-vaughanii* considered as one of the early vascular plants? 3+6+3=12

6. What is coralloid root of *Cycas*? With suitable sketches, describe the structure of female cone of *Gnetum*. Who reconstructed *Williamsonia sewardiana*? Give a brief description of this reconstructed plant. 2+(2+3)+1+4=12

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TDP (Honours) 2nd Semester Exam., 2017

BOTANY

(Honours)

SECOND PAPER

(Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. Why is *Chara* called as 'stonewort'? With the help of suitable labelled sketches, describe the sexual reproductive structures of *Oedogonium*. What are macrandrous and nannandrous species? 1+(2+6)+3=12

2. Differentiate between unilocular and plurilocular sporangia of *Ectocarpus*. With labelled sketches, describe the life cycle of *Polysiphonia*. Write the economic importance of Rhodophyceae. 3+6+3=12

3. Why are bryophytes called as amphibian plants? Write a note on the alternation of generation of bryophytes. With the help of labelled diagram, describe the internal structure of *Funaria* capsule. 1+5+(2+4)=12

UNIT—II

4. What is Telome? Why is *Equisetum* called as 'horsetail'? With the help of suitable illustrations, describe the strobilus structure of *Equisetum*. What is sporangiophore? 2+2+(2+4)+2=12

5. What do you understand by long and dwarf shoot of *Pinus*? With labelled sketches describe the structure of female strobilus of *Pinus*. Write a note on the reproductive organs of *Archaeopteris*. 1+1+(4+2)+4=12

6. Discuss the floral distribution of Middle Gondwana system. Give a brief note on the anatomical features of *Lyginopteris oldhamia* stem. What is coal ball? 6+4+2=12

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TDP (Honours) 2nd Semester Exam., 2018

BOTANY

(Honours)

SECOND PAPER

(Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. What is Palmella stage? With a suitable labelled sketch, describe the cell structure of *Chlamydomonas*. Briefly describe the sexual reproduction in *Chlamydomonas* with neat labelled sketches. 2+4+(4+2)=12

2. What are the storage foods found in different groups of algae? Mention the types of thallus structure found in algae with example. Write the advanced character found in *Chara* in comparison to other Chlorophycean algae. 3+(4+2)+3=12

3. Which sporophyte is the tallest among the Hepaticopsida? What is calyptra? With a labelled sketch, describe the structure of *Pellia* sporophyte. Add a brief note on spore dispersal mechanism of *Anthoceros*.

1+2+(2+4)+3=12

UNIT—II

4. Name two heterosporous pteridophytes studied by you. What is rhizophore? With suitable illustrations, describe the structure of *Selaginella* strobilus. What is synangium?

2+2+(2+4)+2=12

5. What is nucellar beak? Describe the structure of female gametophyte of *Cycas* with suitable sketches. Write a note on angiospermic characters of *Gnetum*.

2+(4+2)+4=12

6. Write short notes on (any *four*) : 3×4=12

(a) Characteristic plants of Mesozoic era

(b) Williamsonia

(c) Importance of fossil study

(d) Miadesmia

(e) Types of mega fossils

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TDP (Honours) 2nd Semester Exam., 2019

BOTANY

(Honours)

SECOND PAPER (Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. State why the life cycle pattern of *Ectocarpus* is called as isomorphic diplohaplontic type. With labelled figures, describe the process of formation of zoomeiospores in *Ectocarpus*. Add a note on the salient features of Chlorophyceae. Comment on industrial use of algae. 2+(1+3)+3+3=12

2. Give an outline classification of algae (Lee 1999) up to phylum. Describe the process of pedogamy in diatoms. What is Gongrosira stage? Discuss the sexual reproduction of *Vaucheria* with diagram. Why is the life cycle of *Polysiphonia* called triphasic life cycle? 3+2+1+(2+3)+1=12

3. State why the sporophyte of *Riccia* is considered as the simplest one among the bryophytes. With suitable diagram, explain the structure of sporophyte of *Marchantia*. Write a brief account on the progressive theory of evolution of bryophytes. Name one aquatic species of *Riccia*. What are exostome and endostome? 1+(2+3)+4+1+(½+½)=12

UNIT—II

4. Which pteridophyte is considered as gold indicator? With labelled sketches, describe the structure of strobilus of *Equisetum*. Write two advantages of seed habit. What is telome truss? Explain the concepts of overtopping and planation. 1+(1+3)+2+1+(2+2)=12

5. What are trabeculae? With suitable diagram, discuss the development of male gametophyte of *Pinus*. Compare the structure of ovule of *Pinus* with *Gnetum*. How does the endosperm of *Cycas* differ from angiospermic one? 1+(2+4)+3+2=12

6. In which geological era, gymnosperms are originated? Describe the internal structure of *Lyginopteris oldhamia* stem. Add notes on coalified compression and cellular permineralization. Write an account on floral assemblage of lower Gondowana. 1+4+(2+2)+3=12

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TDP (Honours) 2nd Semester Exam., 2020

BOTANY

(Honours)

SECOND PAPER (Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. Explain the ultrastructure of flagella with suitable diagram. Add a note on the origin of sex in algae. Cite two economic importances of algae used as food. (4+2)+4+2=12

2. What is equisetoid habit of *Chara* sp.? Discuss with diagram how dwarf male is produced in *Oedogonium* sp. Describe the structure of diatom cell with labelled figures. Mention the pigment that is responsible for red colouration of Rhodophycean algae. 1+(3+2)+(3+2)+1=12

3. State the homologous theory of alternation of generations in Bryophytes. What is calyptra? Describe the structure of sporophyte of *Anthoceros* with suitable diagram. Why is the sporophyte of *Funaria* sp. treated as more advanced than that of *Riccia* sp.? 3+1+(4+2)+2=12

UNIT—II

4. What is synangium? Describe the structure of sporocarp of *Marsilea* sp. with labelled diagram. Add a note on the origin of seed habit. Enumerate the land adaptive features of *Rhynia* sp. 1+(3+2)+3+3=12

5. Why is *Cycas* sp. called 'palm fern'? Differentiate between pollen grains of *Cycas* and *Pinus*. With suitable diagram, discuss the development of male gametophyte of *Cycas* sp. Write a note on the economic importance of gymnosperms. 1+2+(2+4)+3=12

6. Define index fossil. Write the conditions favouring fossilization. Discuss the female fructification of *Williamsonia* with diagram. Give a note on floral assemblage of Palaeozoic era. 1+4+(3+1)+3=12

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TDP (Honours) 3rd Semester Exam., 2015

BOTANY

(Honours)

THIRD (A) PAPER

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. Briefly explain the 'degeneration of sex' in fungi with suitable examples. Discuss the significance of fungi in medicine industry. Mention how parasexual cycle differs from sexual cycle. (5+2)+3+2=12

2. What is zygospore? Describe the formation of zygospore in *Mucor* species with suitable sketches. Comment on heterothalism. 1+(5+2)+4=12

3. Give the scientific names, their parts used and economic values of the following plants : (1+1+1)×4=12

(a) Coffee

(b) Digitalis

(c) Clove

(d) Cotton

UNIT—II

4. With suitable diagram, describe the process of transduction in bacteria. What is endospore? Add a note on cell wall of bacteria. (2+5)+2+3=12

5. What is phytoalexin? Discuss how phytoalexin affects the defense mechanisms in plants. Mention the different types of disease symptom found in plant with examples. 2+5+5=12

6. Name the causal organism of late blight of potato. What are the predisposing factors for outbreak of this disease? Mention four major symptoms with effective control measures. What is necrotic symptom? 1+4+(4+2)+1=12

★★★

TDP (Honours) 3rd Semester Exam., 2016

BOTANY

(Honours)

THIRD (A) PAPER

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. What is corticolous lichen? Enumerate the actual relationship between the different components of lichen thallus. Name the biological source of litmus paper. Differentiate zygote from zygospore. Write the names of different asexual spores of fungi with examples. 2+3+1+2+4=12

2. Define primary and secondary mycelium. How are clamp connections formed? Describe the cellular organization of hymenium of *Agaricus*. Write down the commercial importances of *Agaricus*. 2+3+5+2=12

3. Discuss briefly the rice cultivation by SRI method in Tripura. Name two timber-yielding plants with their scientific names of Tripura. Name one common disease and its pathogen of rubber plant. 6+2+2+2=12

UNIT—II

4. What are nonliving characters of virus? Describe the structure of tobacco mosaic virus (TMV) with suitable diagram. Discuss the life cycle of a temperate phage. 2+5+5=12

5. What do you mean by heteroecious polymorphic rust? Name the causal agent of black stem rust of wheat. Describe briefly its symptoms found in wheat. Mention how this disease recurs. Write two effective control measures of this disease. 2+2+4+2+2=12

6. Discuss the steps followed in Koch's postulates. Describe different types of hyper-plastic symptoms with examples. What do you mean by plant quarantine? 5+5+2=12

★★★

TDP (Honours) 3rd Semester Exam., 2017

BOTANY

(Honours)

THIRD (A) PAPER

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. What are the distinct phases of sexual reproduction in fungi? Briefly outline the various methods of sexual reproduction in fungi with examples. What are the categories of sex in fungi on the basis of compatibility? 3+5+4=12

2. What is meant by 'fungi imperfecti'? Discuss the specialised structures associated with asexual reproductions in this fungi. Briefly describe the events in a complete parasexual cycle. 2+5+5=12

3. Give the botanical names of four commonly used oil-yielding plants with mentioning their families and uses. What is 'para-rubber'? Mention the names of other important rubbers. Discuss in brief the processing of rubber latex. (1½×4)+1+2+3=12

UNIT—II

4. Briefly characterise the genophore of bacteria. Describe the structure of endosphore of bacteria. Discuss the role of *F*-factor in the sexual reproduction of bacteria. 3+3+6=12

5. How do you differentiate between blight and rot? Name the causal organism of brown spot of rice. Discuss the symptoms and control measures of this disease. 3+2+(4+3)=12

6. Discuss in brief the stages in the development of plant disease. What is hypoplastic symptom? Mention the names of various types of hypoplastic symptoms with salient features and examples. 6+1+5=12

★★★

TDP (Honours) 3rd Semester Exam., 2018

BOTANY

(Honours)

THIRD (A) PAPER

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. What do you mean by Buller phenomenon? Describe the basidiocarp of Agaricus with labelled diagram. Add a note on development of ascocarp of Penicillium. 2+(3½+1½)+5=12

2. What are mycotoxins? Why are lichens exemplified as a case of symbiosis? Write an account of different morphological growth forms of lichens. Give an outline of classification of fungi as proposed by Hawksworth (1995). 1+2+5+4=12

3. Write the scientific names, families and parts used of *(a) Digitalis* and *(b)* Coffee. What do you mean by SRI system of rice cultivation? Mention its advantages. What are the steps in the process of black tea production?

$(1+½+½)\times2+2+3+3=12$

UNIT—II

4. What is temperate phage? Describe the lytic cycle of bacteriophage with schematic diagram. Write a note on bacterial cell wall. What is mesosome? $1+(5+1)+3+2=12$

5. Define pathogenicity. What is disease triangle? Name the causal organism of stem rot of jute. Describe in brief the symptoms, disease cycle with schematic diagram and control measures of the disease.

$1+1+1+3+3+3=12$

6. What do you mean by quarantine regulation? Why is it important in management of plant disease? Write a short note on Koch's postulates. What are phytoalexins? $2+4+4+2=12$

★★★

TDP (Honours) 3rd Semester Exam., 2019

BOTANY

(Honours)

THIRD (A) PAPER

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. What are holocarpic and eucarpic fungi? Briefly describe the life cycle pattern of *Mucor* with suitable sketches. What are the different asexual spore forms produced in fungi? Describe with examples. 2+(4+2)+4=12

2. Describe how lichens reproduce. Briefly describe the ecological importance of lichens. Write the scientific names, families, usable parts and uses of the following plants—
(a) Groundnut *(b)* Sal. 4+3+(1+½+½+½)×2=12

3. Give the scientific names (genus and species), families, and parts used of papaya, cinchona and sugarcane. Mention the scientific name (genus and species) and family of rubber plant which is widely cultivated in Tripura. Discuss in brief the processing of rubber—latex. $(1+\frac{1}{2}+\frac{1}{2})\times 3+1\frac{1}{2}+4\frac{1}{2}=12$

UNIT—II

4. What is nucleoid? Describe the structure and characteristic features of bacterial endospore. Discuss briefly the conjugation process of bacterial reproduction. What is episome? 1+4+6+1=12

5. Name the causal organism of late blight of potato. Briefly describe the symptoms, disease cycle with schematic diagram and control measures of the disease. What is Klendusity? 1+3+4+3+1=12

6. What are biotrophs? Why is *Puccinia graminis* var. *tritici* called macro-cyclic heteroecious rust fungi? What are the different types of spore forms present in the rust fungi? Write the symptoms of the disease 'Black stem rust of wheat' on its primary host. What is systemic disease? 2+2+3+3+2=12

★★★

TDP (Honours) 3rd Semester Exam., 2020
(Held in 2021)

BOTANY

(Honours)

THIRD (A) PAPER

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. Why is *Fusarium* called anamorphic fungi? Add a brief note on asexual reproduction in *Fusarium*. With suitable evidences, justify that "degeneration of sex in fungi is actually the simplification of sex organs". What is ergot toxin? Discuss the specialized structures found in lichens. 2+3+3+1+3=12

2. How do conidia differ from aplanospores? Describe the internal structure of the fruit body of *Polyporus* sp. with labelled diagram. What is fairy ring? Add a note on the major commercial product type of tea. 1+(5+2)+1+3=12

3. Write scientific names (genus and species), families and parts used of *(a)* clove, *(b)* Papaver and *(c)* moong. Discuss the cultivation procedure of tea. What do you mean by CTC? $(1+\frac{1}{2}+\frac{1}{2})\times3+4+2=12$

UNIT—II

4. What is Hfr strain? Distinguish between Gram-positive and Gram-negative bacteria in respect of chemical constituent of cell wall. Explain the lytic cycle of T_2 bacteriophage with suitable diagram. What is endospore? $2+2+(4+2)+2=12$

5. How does specialized transduction differ from generalized transduction? Briefly characterize the genophore of bacteria. Write the steps followed in Koch's postulate. Mention the spore types of *Puccinia graminis* var. *tritici* along with respective hosts. $2+3+4+3=12$

6. Define inoculum. What is systemic disease? Write the causal organism and symptoms of stem rot of jute disease. Give a note on hyperplastic symptoms. Schematically represent the disease cycle of brown spot of rice. $1+1+(1+3)+4+2=12$

★★★

TDP (Honours) 3rd Semester Exam., 2021
(Held in 2022)

BOTANY

(Honours)

THIRD (A) PAPER

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. Give the outline classification of Hawksworth (1995). With suitable diagram, describe different types of ascocarps. What is penicillus? 4+(2+4)+2=12

2. Describe the sexual reproduction in *Mucor* sp. with suitable sketches. What is gluten? Mention the physical properties of rubber. What are the uses of rubber? (3+2)+2+2+3=12

3. Write the scientific names, families and usable parts of groundnut, gram, ginger and teak. What is beat-break-jerk method? Why are tea plants pruned every year?
$(1+\frac{1}{2}+\frac{1}{2})\times4+2+2=12$

UNIT—II

4. Mention the salient features of viruses. With suitable sketches, describe the lysogenic cycle in Lambda (λ) phages. What do you mean by virulent and temperate phages?
$3+(2+4)+3=12$

5. Define mesosome. With suitable diagram, describe the process of conjugation between F^+ and F^- bacterium. Give a note on hypoplastic symptoms. What is pathogen?
$2+4+4+2=12$

6. Write the causal organism and symptoms of late blight of potato disease. Name the primary and secondary host of *Puccinia graminis* var. *tritici* Briefly describe the symptoms and control measures of black stem rust of wheat. $1+3+2+4+2=12$

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TDP (Honours) 4th Semester Exam., 2016

BOTANY

(Honours)

FOURTH PAPER (Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. With suitable sketches and examples, describe the different types of cohesion of stamens. Briefly describe the double fertilization process in angiospermic plants. (2+1+3)+6=12

2. What is labellum? Mention the diagnostic characters of Orchidaceae family. Why is Orchidaceae considered to be the most advanced among monocotyledons? Mention the economic importance of Cucurbitaceae. Name a plant of Cucurbitaceae with one-seeded fruit. 2+3+4+2+1=12

3. Enumerate the different types of 'embryo sac' found in angiosperms. With suitable diagrams and examples, describe any five types of tetrasporic embryo sac. 1½+(2½+2½+5½)=12

UNIT—II

4. What is meristem? On the basis of function, classify meristem mentioning the characters of each type. With suitable sketches, describe the gross microscopic structure of plant cell wall. 1+(1+3)+(2+5)=12

5. What do you mean by niche? Name the pioneer colonisers of Xeric succession. Briefly describe orderly steps of Xerosere. With suitable examples, mention the anatomical modifications in hydrophytes. 1+1+6+4=12

6. *(a)* With labelled diagram, describe the anomalous secondary growth of a dicot stem where cambium is normal in position but abnormal in activity.

(b) Briefly describe the vegetation of Eastern Himalaya. (3+4)+5=12

★★★

TDP (Honours) 4th Semester Exam., 2017

BOTANY

(Honours)

FOURTH PAPER (Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. What is accrescent calyx? Discuss briefly the modifications of calyx found in angiosperms with suitable examples. Describe a typical angiospermic ovule with a labelled diagram. 2+6+4=12

2. What is heterogamous capitulum? Mention the diagnostic characters of family Cucurbitaceae. Write the economic importance of Poaceae. Draw the inflorescence type of Lamiaceae family. 2+4+4+2=12

3. What is archesporial cell? With suitable sketches, describe the development of microspores in angiosperms. What is endosperm? Give a brief note on nuclear type of endosperm. 2+(2+4)+1+3=12

UNIT—II

4. Write the components of plant cell wall. What is Casparian strip? With suitable sketches, describe different types of vascular bundles found in angiosperms. 2+2+(3+5)=12

5. What are endemics? Write a note on age and area hypothesis. Briefly describe the external morphology of roots and viviparous mode of seed germination in halophytes. 2+4+3+3=12

6. *(a)* In a schematic map drawn by you, point out the phytogeographical regions proposed by D. Chatterjee (1960).

(b) With labelled sketches, describe the normal secondary growth in intrastelar region of a dicotyledonous stem. 5+(3+4)=12

★★★

TDP (Honours) 4th Semester Exam., 2018

BOTANY

(Honours)

FOURTH PAPER (Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. What is spikelet? With suitable sketches, describe different types of cohesion of stamens in angiospermic flower with examples. What is sorosis? 2+(1½+5+1½)+2=12

2. Write the diagnostic characters of the family of Poaceae. Give the floral formula and floral diagram of this family. What type of inflorescence, fruit and stamens are found in the family Asteraceae? What is the utility of feathery stigma in Poaceae family?

(5+1+1)+(1+1+1)+2=12

3. What is bisporic embryo sac? Describe a typical dicotyledonous embryo development in angiosperm with diagram. Why is the endosperm in angiosperm triploid? What is exine? 2+(5+2)+2+1=12

UNIT—II

4. Distinguish between fascicular and interfascicular cambium. Describe different types of siphonostele with suitable sketches and examples. What is plasmodesmata? 2+(6+2)+2=12

5. What is succession? Describe the various stages of plant succession in hydrosere. Distinguish between paleoendemic and neoendemic. What is Red Data Book? 2+6+2+2=12

6. How does the flora of Eastern Himalaya differ from that of Western Himalaya? Give a short description of the flora of Tripura. Why are orchids more prevalent in Eastern Himalaya than Western Himalaya? 3+7+2=12

★★★

TDP (Honours) 4th Semester Exam., 2019

BOTANY

(Honours)

FOURTH PAPER (Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. What is spadix? With suitable sketch, describe the structure of heterogamous capitulum. Mention the parts of a papilionaceous corolla. Give the diagrammatic representation of imbricate, quincuncial and vexillary aestivations with example. 2+3+1+(2+2+2)=12

2. Write the diagnostic characters of Magnoliaceae family. What is lodicule? Mention the modifications found in an orchid flower. Give the floral formula and floral diagram of Brassicaceae family. Write the economic importance of Solanaceae family. 3+1+3+(1+2)+2=12

3. What is tapetum? With suitable sketches, describe microsporogenesis in angiosperms. Briefly describe the cellular and nuclear type of endosperm formation in angiospermic embryo sac. 2+(3+2)+(2½+2½)=12

UNIT—II

4. What is meristem? Briefly describe the structure and functions of meristematic tissue. What is periderm? How is periderm developed in higher plants during secondary growth? 2+(3+2)+2+3=12

5. What is niche? With suitable sketches and example, describe the morphological adaptations found in hydrophytes. Briefly describe the ecological adaptations in halophytes. 2+(2+2+3)+3=12

6. Show the phytogeographical region of India (D. Chatterjee, 1960) in a self-drawn map of India. Describe the flora of Eastern Himalaya. Which phytogeographical region is richest in orchid population? 4+7+1=12

★★★

3. What is tapetum? With suitable sketches, describe microsporogenesis in angiosperms. Briefly describe the cellular and nuclear type of endosperm formation in angiospermic embryo sac. 2+(3+2)+(2½+2½)=12

UNIT—II

4. What is meristem? Briefly describe the structure and functions of meristematic tissue. What is periderm? How is periderm developed in higher plants during secondary growth? 2+(3+2)+2+3=12

5. What is niche? With suitable sketches and example, describe the morphological adaptations found in hydrophytes. Briefly describe the ecological adaptations in halophytes. 2+(2+2+3)+3=12

6. Show the phytogeographical region of India (D. Chatterjee, 1960) in a self-drawn map of India. Describe the flora of Eastern Himalaya. Which phytogeographical region is richest in orchid population? 4+7+1=12

★★★

TDP (Honours) 4th Semester Exam., 2020

BOTANY

(Honours)

FOURTH PAPER (Group—A)

Full Marks : 48

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking **two** from each Unit

UNIT—I

1. What is raceme? With suitable examples, describe adhesion of stamens in angiospermic flowers. What is apocarpous carpel? With suitable diagram, mention the parts of drupe type of fruit. What is marginal placentation? 1½+(1½+3)+2+2+2=12

2. What is caryopsis? Write the diagnostic characters of Poaceae family. Why is Asteraceae regarded as highly advanced family among dicotyledons? Give the floral formula of Poaceae. Write the economic importance of Brassicaceae family. 2+3+3+1+3=12

3. What is meant by double fertilization? With suitable diagram, describe the process of fertilization in Angiosperms. Describe the bisporic embryo sac formation in Angiosperms with proper diagram. 2+(2+4)+(3+1)=12

UNIT—II

4. What is plasmodesmata? Briefly describe the chemical composition of cell wall. With suitable sketches, describe the anomalous secondary growth in *Boerhaavia* stem. 2+5+(2+3)=12

5. What do you mean by xerosere? With suitable diagram, describe the seral stages of xerosere. Mention the anatomical adaptive features of xerophytes. 2+(2+5)+3=12

6. Describe the different theories of endemism. Briefly describe the vegetation of Tripura. What is Red Data Book? 4+6+2=12

★★★

9. *(a)* What is frequency distribution? Distinguish between simple frequency distribution and group frequency distribution providing data of each case in tabular form.

(b) In a field trial experiment of two-wheat varieties, following data on grain length (mm) are recorded :

Variety—A :
11, 9, 10, 14, 12, 13, 15, 17, 16, 16, 15, 16, 17, 15, 17

Variety—B :
12, 13, 13, 12, 14, 14, 12, 14, 15, 16, 17, 16, 16, 15, 17

Compare the means of the two varieties by performing suitable statistical test.

[Tabulated $t = 2{\cdot}763$, (0·01 p) for 28 df]

(2+4)+8=14

★★★

TDP (Honours) 5th Semester Exam., 2016

BOTANY

(Honours)

FIFTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and *any* **five** from the rest, taking at least **one** from each Unit

Candidates are required to give their answers in their own words as far as practicable

1. Answer the following : 1×10=10

(a) What is 'C' value?

(b) What do you mean by satellite DNA?

(c) What is the difference between hnRNA and mRNA?

(d) What is the function of operator gene?

(e) What is missense mutation?

(f) Name a vector which is frequently used for cloning a large segment of DNA.

(g) What is centimorgan?

(h) Name two heat-stable DNA-polymerase enzymes which are used in PCR.

(i) What is goodness of fit?

(j) What do you mean by EcoRI?

UNIT—I

2. What do you understand by cell cycle? Discuss the role of MPF in cell cycle. Why is telomere essential for survival of chromosome? What do you mean by apoptosis? 2+7+3+2=14

3. What is 'nu' particle? With suitable illustrations, give an account of the structural organization of chromosome with reference to nucleosome concept. Mention the components of prokaryotic and eukaryotic ribosomal subunits. 2+(3+5)+(2+2)=14

UNIT—II

4. What is B-model of DNA? With suitable illustration, explain how replication is accomplished in leading and lagging strands in a prokaryotic organism explaining the role of primase. Mention the role of GTP in translation. 2+(3+6)+3=14

5. What do you mean by tautomerism? Distinguish between transition and transversion. Explain how nitrous acid induces mutation. Predict the products of structural genes of lac operon when lactose is added in the medium. 2+3+5+4=14

UNIT—III

6. What do you mean by epistatic and hypostatic genes? Illustrate with suitable figure, how dominant epistatic interaction changes the Mendel's dihybrid ratio. What is atavism? What do you mean by segmental allopolyploidy? (2+2)+(2+5)+1+2=14

7. What is reciprocal translocation? With suitable diagram, describe the meiotic behaviour of a translocation heterozygote. How can functional gametes be formed from such a translocation heterozygote? Distinguish between pericentric and paracentric inversions. 2+(3+5)+1+3=14

UNIT—IV

8. What is male sterility? Explain different types of male sterility with suitable examples and illustrations. Add a note on heterosis. 2+(3+3+3)+3=14

TDP (Honours) 5th Semester Exam., 2017

BOTANY

(Honours)

FIFTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and *any* **five** from the rest, taking at least **one** from each Unit

1. Answer the following : 1×10=10

(a) Why are two strands of DNA called antiparallel?

(b) Write the triplet code for amber and opal.

(c) What do you mean by MPF?

(d) What is VIR gene in *Agrobacterium* sp.?

(e) What is frequency polygon?

(f) What is Wobble hypothesis?

(g) What is atavism?

(h) Define male sterility.

(i) What is apoptosis?

(j) What is binary vector?

UNIT—I

2. What do you understand by C-value? Is there any difference between the C-value of *(a)* mitotic metaphase and meiotic metaphase–I, and *(b)* meiotic anaphase–I and meiotic anaphase–II? Justify your answer. Mention different theories of anaphasic movement. Give a short account of symbiotic origin of mitochondria. 2+(2+2)+4+4=14

3. Explain the fluid mosaic model of plasma membrane with suitable illustration. How is the fluidity of plasma membrane maintained? What do you mean by holokinetic chromosome? (6+2)+5+1=14

UNIT—II

4. Enumerate the basic steps in prokaryotic transcription. Mention the function of different subunits of RNA-polymerase. How does termination of transcription occur? Prove that genetic code is in triplet. 2+4+4+4=14

5. What are the restriction enzymes? Cite examples. Distinguish between type—I and type—II restriction enzymes. Write the principle of polymerase chain reaction (PCR). State its application. (2+1)+4+5+2=14

(Continued)

UNIT—III

6. What is linkage? Demonstrate the cytological basis of genetic crossing over with suitable example. What is three-point test cross? Mention its significance in genetical analysis. 1+8+2+3=14

7. What are genomics and proteomics? How is euploidy different from aneuploidy? Write a note on the role of polyploidy in crop improvement. (2+2)+3+7=14

UNIT—IV

8. Write the merits and demerits of mass and pureline selection. What is the role of RF genes? What is goodness of fit? 5+5+2+2=14

9. Find out the mean, standard deviation and standard error of mean from the results of a given experiment :

No. of obs.	*Plant height* (in cm)		
	Control	T_1	T_2
1	132	36	185
2	142	32	169
3	129	39	160
4	156	40	172
5	168	43	192

What is Student's *t*-test? (3+4+5)+2=14

★★★

9. Define mean, mode and median. Write about the merits of standard deviation. Find out the mean and mean deviation from the following frequency distribution : (2+2+2)+3+(2½+2½)=14

No. of pods per plant (x)	15–17	18–20	21–23	24–26	27–29
No. of plants (f)	6	5	12	8	19

★★★

TDP (Honours) 5th Semester Exam., 2018

BOTANY
(Honours)

FIFTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and *any* **five** from the rest, taking at least **one** from each Unit

1. Answer the following : 1×10=10

(a) What are the components of eukaryotic ribosomal subunit?

(b) What is quantasome?

(c) What do you mean by Chargaff's rule?

(d) Why is newly synthesized mRNA single stranded?

(e) What is Klenow fragment?

(f) What is histogram?

(g) Which has more DNA and less RNA—euchromatin or heterochromatin?

(h) What do you mean by the term 'epistatic gene'?

(i) What is monoploidy?

(j) What is hybrid vigour?

UNIT—I

2. What is apoptosis? Write its importance. Describe meiotic division I along with diagrams. Define endocytosis and explain it with diagram. 2+2+(4+2)+(1+3)=14

3. Write a note on ultrastructure of chloroplast. Why are mitochondria and chloroplasts called as semi-autonomous organelle? Write a brief note on the structure and function of telomere. Explain how histone protein is important in DNA packaging. 5+2+(2+2)+3=14

UNIT—II

4. Briefly explain inducible operon with suitable diagram. Write a short note on enzymology of prokaryotic DNA replication. Describe the classical experiment which demonstrated the semi-conservative mode of DNA replication. 5+5+4=14

5. How does 70S ribosome recognize mRNAs? Explain how an amino acid is activated and then attached to its specific protein. What is initiation complex and how does it get formed during protein synthesis? Explain with suitable drawing. 5-Bromouracil and nitrous acid are chemical mutagens—what does each do? 2+3+(1+3+2)+3=14

UNIT—III

6. What do you mean by 'polygenes'? Illustrate with suitable figure, how complementary factor changes the Mendel's dihybrid ratio. What is pleiotropism? Distinguish between autopolyploids and allopolyploids. 2+(2+5)+2+3=14

7. Define linkage. What do you mean by linkage group? Expand the term 'FISH'. Write down the steps involved in FISH technology. Write its application. Explain Robertsonian translocation. (2+2)+(1+3+3)+3=14

UNIT—IV

8. Write a note on the general hybridization procedure. Compare between pedigree and bulk method. What are backcross and test-cross? 6+4+(2+2)=14

TDP (Honours) 5th Semester Exam., 2019

BOTANY

(Honours)

FIFTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and **five** from the rest, taking at least **one** from each Unit

1. Answer the following : 1×10=10

(a) Define c-value.

(b) What is 'SOS' repair?

(c) What do you mean by Quiescent phase?

(d) Why is genetic code said to be degenerative?

(e) Define an operon.

(f) What is atavism?

(g) What is segmental polyploidy?

(h) Define hybrid vigour.

(i) What do you mean by degrees of freedom?

(j) Define acclimatization.

UNIT—I

2. What is chromosome? What are the functions of centromere and telomere? What are histone proteins? Give an account of the nucleosome model of chromosome with suitable diagrams. 2+1+1+2+(5+3)=14

3. Illustrate the organization of nucleus with labelled diagram. Describe Prophase–I of Meiosis–I. What are the differences between prokaryotic and eukaryotic ribosomes? (4+2)+6+2=14

UNIT—II

4. Briefly describe Rho-dependent and Rho-independent termination of prokaryotic transcription. Explain PCR with labelled diagram. 6+(6+2)=14

5. Write a short note on Wobble hypothesis. Differentiate between B form (B-DNA) and A form (A-DNA) of DNA. Replication of DNA is semidiscontinuous. Explain with labelled diagram. 3+3+(4+4)=14

UNIT—III

6. Define amphidiploidy. Write the scientific names of two polyploid plants and mention their somatic chromosome numbers. Name some chemicals used in induction of polyploidy. Discuss, in brief, the role of polyploidy in evolution of plants with suitable examples. 2+3+2+7=14

7. What is meant by incomplete dominance? What is epistasis? What is the ratio of supplementary factor? Why is it called a 'recessive epistasis'? Illustrate with suitable checkerboard, how recessive epistatic interaction changes the Mendel's dihybrid ratio. 2+2+2+2+6=14

UNIT—IV

8. What is male sterility? Explain cytoplasmic-genetic basis of male sterility. Define emasculation. Write a detailed note on various processes of emasculation. 2+4+2+6=14

9. Define primary data and secondary data. What are the types of sampling method? What is student's *t*-test? The effect of a new

growth regulator (*X*) on the callus growth of *Nicotiana* sp. in laboratory condition is given below :

Callus No.	1	2	3	4	5
Initial wt. of callus (gm)	2·9	2·7	2·8	2·8	2·9
Final wt. of callus (gm)	3·0	2·8	2·9	2·8	3·2

Callus No.	6	7	8	9	10
Initial wt. of callus (gm)	2·9	2·8	3·0	2·6	2·8
Final wt. of callus (gm)	3·1	3·0	3·2	2·7	2·9

Determine whether the effects of growth regulator on callus growth has any significant effect or not. (*t*-value for 9 degrees of freedom at 0·001 probability is 4·781). 14

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TDP (Honours) 5th Semester Exam., 2020
(Held in 2021)

BOTANY

(Honours)

FIFTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and **five** from the rest, taking at least **one** from each Unit

Candidates are required to give their answers in their own words as far as practicable

1. Answer the following : 1×10=10

(a) What is the most important function of glyoxysome?

(b) What is NOR?

(c) What do you mean by split genes?

(d) What are lethal genes?

(Turn Over)

(e) What is meant by degrees of freedom?

(f) What do you mean by SAT-chromosome?

(g) Define emasculation.

(h) What do you mean by nucleosome?

(i) Define heterosis.

(j) What is secondary data?

UNIT—I

2. Which phase of cell cycle is known as synthetic phase and why? Discuss the role of MPF in cell cycle. Is there any difference between the C-value of mitotic metaphase and meiotic metaphase-I? Justify your answer. What do you mean by apoptosis?

(1+2)+7+2+2=14

3. Distinguish between RER and SER. Briefly describe the fluid-mosaic model of plasma membrane with diagram. Why is mitochondria called semi-autonomous organelle? Add a note on cpDNA.

2+(5+2)+3+2=14

UNIT—II

4. What is the difference between transversion and frameshift mutation? With the help of diagrams, explain these two types of mutations. Write a note on the role of physical and chemical mutagens in mutation.

3+(2+4)+(2+3)=14

5. What is hnRNA? With suitable illustration, explain how replication is accomplished in leading and lagging strands in prokaryotic organism. Prove that genetic code is *(a)* triplet and *(b)* non-overlapping in nature.

2+(2+6)+(2+2)=14

UNIT—III

6. What are chromosomal aberrations? Enumerate the different types of such aberrations. Distinguish between paracentric and pericentric inversion. Illustrate the fate and behaviour of a chromosome during meiotic division that has *(a)* pericentric and *(b)* paracentric inversions. 2+2+2+(4+4)=14

7. What do you mean by epistatic and hypostatic genes? Illustrate with suitable checkerboard, how dominant epistatic interaction changes the Mendel's dihybrid ratio. How does supplementary factor differ from dominant epistatic interaction?

3+(2+6)+3=14

UNIT—IV

8. Define acclimatization. Describe in brief the different steps of hybridization process. Explain cytoplasmic basis of male sterility. Distinguish between mass selection and pure line selection. Add a note on 'hybrid vigour'.

2+4+4+2+2=14

9. What are dependent events and independent events in probability? Explain the addition and multiplication rules of probability through examples. What are the advantages of performing Chi-square test? Find out the correlation coefficient between the two attributes of five plants : (1+1)+(3+3)+2+4=14

Height of the plant (x) in centimetre	5	9	13	17	21
Number of leaves per plant (y)	12	20	25	33	35

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TDP (Honours) 5th Semester Exam., 2021
(Held in 2022)

BOTANY

(Honours)

FIFTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and **five** from the rest, taking at least **one** from each Unit

Candidates are required to give their answers in their own words as far as practicable

1. Answer the following : 1×10=10

(a) What do you mean by C-value?

(b) Define satellite DNA.

(c) Write the function of promoter gene.

(d) What is centimorgan?

(e) What do you mean by hybrid vigour?

(f) Write the names of amino acids specified by only one codon.

(g) What is pleiotropism?

(h) What is meant by acclimatization?

(i) What is goodness of fit?

(j) What is bidirectional replication?

UNIT—I

2. What do you mean by NOR? With suitable illustration, give an account of the structural organization of chromosome with reference to nucleosome concept. Classify chromosome on the basis of position of centromere. What do you mean by F_0-F_1 particle? 2+(3+5)+2+2=14

3. What are the differences between prokaryotic and eukaryotic ribosomes? With suitable diagram, describe the structure of chloroplast. Why is chloroplast called semiautonomous organelles? Mention different theories of anaphasic movement. 2+(2+5)+3+2=14

UNIT—II

4. Distinguish between B-DNA and Z-DNA. Describe the basic events of transcription with special reference to RNA chain initiation in prokaryotes. How does termination of transcription occur? Prove that genetic code is commaless. 3+5+3+3=14

5. What do you mean by tautomerism? Distinguish between transition and transversion. Predict the products of structural genes of lac operon when lactose is added in the medium. Write the properties of restriction enzymes. 2+3+5+4=14

UNIT—III

6. What is linkage? Explain the mechanism of crossing over at molecular level. Illustrate incomplete dominance with suitable example. 2+7+5=14

7. What do you mean by genomics? Distinguish between monosomy and trisomy. Describe different types of chromosomal aberration due to change the number of genes in the chromosome. Write a short note about FISH technique. 2+3+6+3=14

TDP (Honours) 6th Semester Exam., 2017

BOTANY

(Honours)

SEVENTH PAPER

(Theory)

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

UNIT—I

1. Write a note on amino acids with special emphasis on essential amino acids. Define apoenzyme, holoenzyme and coenzyme with example of each. 4+(2×3)=10

2. What is an isoenzyme? What is its significance in plant metabolism? What is buffer? What is secondary structure of protein? Define pH. How does hydrogen bond play role in protein structure? 2+1+2+2+1+2=10

3. Describe TCA cycle. Write the steps in the formation of acetyl CoA from pyruvic acid. What is gluconeogenesis? 6+3+1=10

UNIT—II

4. Define water potential. Describe various components of water potential and their relationship. What is the water potential of pure water and how does it change on addition of solute? What is antitranspirant? 1+6+2+1=10

5. Classify plants on their photoperiodic response. Mention the role of plant growth regulators in flowering. What is circadian rhythm and how does it operate? What is phytochrome? 5+2+2+1=10

6. What is photorespiration? Give a detailed account of photorespiration, stating the involvement of the different organelles. How do C_3 and C_4 plants differ in photosynthetic efficiency? 1+6+3=10

UNIT—III

7. What are secondary metabolites? Write short notes on flavonoids, phenolics, alkaloids and their chemical tests. 1+(3×3)=10

8. What is organoleptic study? Describe the various types of methods for crude drug evaluation. What is drug adulteration? 2+(3×2)+2=10

9. Mention the medicinal importance of *Alstonia*. Give an illustrated account of organolepic and microscopic study in *zingiber* rhizome. 3+7=10

UNIT—IV

10. What is meant by totipotency? Define dedifferentiation and re-differentiation. Write short notes on callus and organogenesis. 2+3+(2+3)=10

11. Describe the cell suspension culture and protoplast culture. Mention the protocol for embryo culture. How are monoploid and double monoploid plants produced? (2+2)+4+2=10

12. Define vector. How can it be used for transformation? What are virulence genes? What are Ri and Ti plasmid? 2+1+3+(2+2)=10

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TDP (Honours) 6th Semester Exam., 2018

BOTANY

(Honours)

SEVENTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

UNIT—I

1. With the help of a flowchart, classify carbohydrates with suitable examples. Name the storage polysaccharides of plant and animal cell. Describe the primary, secondary and tertiary structures of protein. What are covalent and non-covalent bonds? (3+1)+2+2+2=10

2. Why is Krebs' cycle called TCA cycle? Explain payoff phase of glycolysis with proper outline sketch. What do you mean by electron transport chain (ETC)? Explain ETC and oxidative phosphorylation of aerobic respiration. 1+4+1+4=10

3. Define chemiosmotic theory. What is zwitterion? Define K_m value and write its two significance. Explain allosteric inhibition of enzyme activity. Give the stoichiometry of TCA cycle. 1+1+3+2+3=10

UNIT—II

4. What is meant by red drop effect and Emerson enhancement effect? Describe the various phases of C_3 cycle of photosynthesis with enzymes. How many ATP molecules are formed by burning of a molecule of glucose? 2+2+5+1=10

5. Define plant growth regulators. Give an account on physiological role of gibberellins in plants. What is brassinosteroids? 2+6+2=10

6. Describe CAM cycle. Give a brief note on the role of CO_2 ions and abscisic acid on the mechanism of stomatal opening and closing. What is Nif-gene cluster? 4+2+2+2=10

UNIT—III

7. How do you differentiate the powdered form of tubers of *Dioscorea* sp. and rhizome of *Zingiber*? Give an account of organoleptic and microscopic study of leaves of *Adhatoda vasica*. Write the chemical constituents of *Andrographis paniculata*. 2+(3+3)+2=10

8. What is crude drug? Write the various steps employed in the production of commercial drugs from crude material. Write a note on the types of adulterants. 2+4+4=10

9. Give a brief account on the classification of crude drugs based on their modes of action. What is meant by chemical evaluation? What are the chemical tests for steroids? 6+2+2=10

UNIT—IV

10. What is habituated callus tissue? How is it formed? What are the main reasons of chromosomal variation in callus tissue? Write a short note on callus culture. 1+2+3+4=10

11. "The *Agrobacterium* is considered as natural genetic engineer of plant." Comment. Why are plant meristems always virus-free? Mention the protocol for meristem tip culture. Mention some commonly used disinfectants in tissue culture. 2+2+4+2=10

12. What is explant? What do you mean by direct gene transfer? Describe the particle bombardment method of gene transfer. How are haploids produced in tissue culture? 1+2+5+2=10

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TDP (Honours) 6th Semester Exam., 2019

BOTANY

(Honours)

SEVENTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

UNIT—I

1. What is antiport? Describe different steps of TCA cycle. Write the steps in the formation of acetyl CoA from pyruvic acid. 2+6+2=10

2. What do you mean by isoelectric point? What are the different physical and chemical properties of water? Define lipids. Write a short note on essential amino acids. 2+4+2+2=10

3. Name the enzymes involved in ten different steps of glycolysis. Explain nomenclature and classification of enzymes according to International Union of Biochemistry and Molecular Biology (IUBMB). 4+3+3=10

UNIT—II

4. What are the major pigments involved in the photosynthesis in higher plants? What are the important products in light reaction of photosynthesis? Give an illustrative account on regeneration of CO_2 acceptor in dark phase of C_3 plants. 2+2+6=10

5. Define photorespiration. How does it differ from dark respiration? With diagram, give a detailed account of the pathway of photorespiration. 2+2+6=10

6. Distinguish between symbiotic and non-symbiotic nitrogen fixation. Write down the mechanism of biological nitrogen fixation in plants with special reference to the role of nitrogenase enzyme. What is leg-haemoglobin? 3+5+2=10

UNIT—III

7. Write a short note on the importance of pharmacognosy in modern medicine. Describe the various types of observation carried out during organoleptic and chemical evaluation of crude drugs. 4+3+3=10

8. Give an illustrative account of organoleptic and microscopic study in the bark of *Alstonia*. Write the drug constituents of rhizome of zingiber and its pharmaceutical uses. 3+4+1½+1½=10

9. What are secondary metabolites? Write a short note on steroids. Illustrate the shikimic acid pathway for the biosynthesis of the plant phenolics. 1+4+5=10

UNIT—IV

10. What is embryo culture? What are the different types of embryo culture? Describe the protocol for embryo culture. 2+3+5=10

11. Mention the protocol for isolation of protoplast. Write a short note on action of cellulose and pectinase on plant cell. Why is liquid medium preferred for protoplast culture? 5+3+2=10

12. What is T_1 plasmid? Mention its various components. Explain the method of *Agrobacterium*-mediated gene transfer. 2+3+5=10

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TDP (Honours) 6th Semester Exam., 2020

BOTANY

(Honours)

SEVENTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. Why is sucrose called as non-reducing sugar? Describe the structure and function of two disaccharides. Name two biologically important lipids with their functions. 2+(3+3)+2=10

2. What do you mean by cofactor, coenzyme and prosthetic groups of enzyme? Give an account of allosteric inhibition of enzyme. What is an isoenzyme? (1+1+1)+5+2=10

3. Define G-protein. Explain -helical structure of a protein. Explain the mechanism of ion uptake. Why does Krebs cycle come to a halt in absence of O_2? 2+3+3+2=10

UNIT—II

4. Distinguish between apoplast pathway and symplast pathway. Describe the various phases of C_4-cycle incorporating the role of various enzymes in the pathway. Why are C_4-plants photosynthetically much more efficient than C_3-plants? 2+5+3=10

5. Why is pentose-phosphate pathway (PPP) called as hexose monophosphate shunt? Explain the sequence of reactions involved with pentose-phosphate pathway. What is the biological significance of pentose-phosphate pathway? 2+6+2=10

6. Write the name of two synthetic auxins used in rooting. Describe the biosynthesis of Indole-3-acetic acid (IAA) in plants. Write the role of gibberellin in *(a)* seed germination and *(b)* parthenocarpy. 2+4+(2+2)=10

UNIT—III

7. Distinguish between crude drug and commercial drug. What is meant by pharmaceutically active constituent? Point out the different conditions of drug adulteration. 2+2+6=10

8. Describe the organoleptic study of leaves of *Adhatoda*. Mention the medicinal constituents present in the tuber of *Dioscorea* sp. Write some common adulterants of ginger. 6+2+2=10

9. What are secondary metabolites? Write short notes on flavonoids, alkaloids along with their chemical tests. What are the chemical tests for terpenoids? 2+(3×2)+2=10

UNIT—IV

10. Define callus. How is it formed? Describe the protocol for callus culture. What is cybrid? 2+2+4+2=10

11. Briefly explain two types of cell suspension cultures. What are the different methods of measuring growth in cell suspension culture? How are the haploid plants made homozygous diploid? (2+2)+4+2=10

12. Define vector. Give two examples of vectors. Distinguish between Ri and Ti plasmids. Describe how aseptic conditions are maintained in plant tissue culture. 2+1+3+4=10

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TDP (Honours) 6th Semester Exam., 2021

BOTANY

(Honours)

SEVENTH PAPER

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **eight** questions, taking **two** from each Unit

Candidates are required to give their answers in their own words as far as practicable

UNIT—I

1. What are essential amino acids? Give example. Mention the important functions of proteins. Classify simple proteins with example. 2+1+3+4=10

2. What do you mean by pH? Describe the primary structure of protein. Name the bonds which are responsible for the formation of tertiary structure of protein. Define reducing sugar. 2+5+1+2=10

3. What do you mean by oxidative decarboxylation? Where does it take place? Describe the different steps of Krebs' cycle mentioning the name of different enzymes involved in this pathway. Mention the summarised account of ATP molecule during oxidation of one molecule of glucose. 2+1+5+2=10

UNIT—II

4. What do you mean by water potential? Describe the mechanism of water absorption by root. What is Emerson's enhancement effect? Mention the function of RuBisCo. 2+4+2+2=10

5. Mention the differences between Pigment System I (PSI) and Pigment System II (PSII). What are the characteristics of CAM plants? Describe various steps of CAM cycle. 3+3+4=10

6. What do you mean by photoperiodism? Classify plants according to their photoperiodic reaction. Write a note on non-symbiotic biological N_2 fixation. 2+4+4=10

UNIT—III

7. What is crude drug? Mention the importance of pharmacognosy in modern medicine. How does organaleptic evaluation help to assess the quality of a drug? 2+4+4=10

8. What are phenolics? Write short notes on steroids and terpenoids along with their chemical tests. Mention the uses of alkaloids. 2+(3×2)+2=10

9. Describe the organoleptic study of *Andrographis paniculata* leaves. Mention its uses. Write the chemical constituents of *Adhatoda vasica*. What is gingering? 4+2+3+1=10

UNIT—IV

10. What is totipotency? Describe the organisation of a typical plant tissue culture laboratory. Why is it necessary to maintain aseptic condition in plant tissue culture? 2+5+3=10

11. What is meristem culture? Describe the methods of protoplast isolation and purification. How somatic hybrids are produced by protoplast culture? 2+(4+2)+2=10

12. What is the purpose of embryo culture? Write down the procedure of embryo culture. Mention the basic steps for *Agrobacterium* mediated transformation. 2+5+3=10

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