

DHANAMANJURI UNIVERSITY

JUNE – 2021

Name of Programme : M.Sc. Botany
Semester : 2nd
Paper Code : BOT-507
Paper Title : Angiosperm Taxonomy and Advanced Morphology
Full Marks : 40

*The figures in the margin indicate full marks for the questions.
Answer all questions.*

1. Elucidate the principles of ICN. What are the roles of herbarium in botanical studies? 7+3 =10

Or

What are the characteristics that enable the hierarchical system of plant classifications? How will you substantiate the view that species constitute the basic unit of classification? 7+3 = 10

2. Describe the broad outline of APG classification system. Explain convergence between different taxa by citing examples. 7+3 = 10

Or

Give the outline of methodology of cladistics. Comment on the role of taxonomic databases in botanical studies. 7+3 = 10

3. With proper labelled diagram, describe the diagnostic features and range of floral structures in Euphorbiaceae. 10

Or

With the help of proper labelled diagram, comment on the advanced characters observed in the floral parts of Orchidaceae. 10

4. Describe the theories that explain the morphological nature of carpel. 10

Or

With labelled diagrams, describe the different views pertaining to the origin of different types of inflorescence. 10

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Name of Programme : M.Sc. Botany
Semester : 2nd
Paper Code : BOT-508
Paper Title : Plant Physiology
Full Marks : 40

*The figures in the margin indicate full marks for the questions.
Answer all questions.*

1. What is Water potential? How is it used to explain osmotic relations in plant cells? How would you determine water potential (Ψ) of a plant tissue? 10

Or

Describe (a) proton-ATPase Pumps (H^+ -ATPases) and (b) ATP-Binding Cassette Transporters (ABC Transporters) in relation to active transport of solute in plants. 5+5 = 10

2. Describe the Carbon dioxide concentrating mechanisms in C4 plants. 10

Or

Describe the mechanism of Bacterial Photosynthesis. 10

3. Explain the overall control of Respiration in relation with other metabolic processes in plant. 10

Or

What is Gluconeogenesis? Enumerate the Bio-synthetic pathway from pyruvate to Glucose. 1+9 = 10

4. Describe the Biosynthesis and mechanism of action of either (a) Auxin or (b) Gibberellins. 10

Or

What are the types of Senescence? Describe the physiological, biochemical and ultra-structural changes in senescence. 10

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Name of Programme : M.Sc. Botany
Semester : 2nd
Paper Code : BOT-509
Paper Title : Genetics and Evolution
Full Marks : 40

*The figures in the margin indicate full marks for the questions.
Answer all questions.*

1. What are alleles, multiple alleles, psuedoalleles and lethal alleles? Why complementation test is important? 10

Or

Find out the genotype and phenotype of offspring of parents with heterozygosity in two pairs of genes by fork-line method. 10

2. Define linkage. Write in brief about sex-linkage and sex-influenced characters. 2+8=10

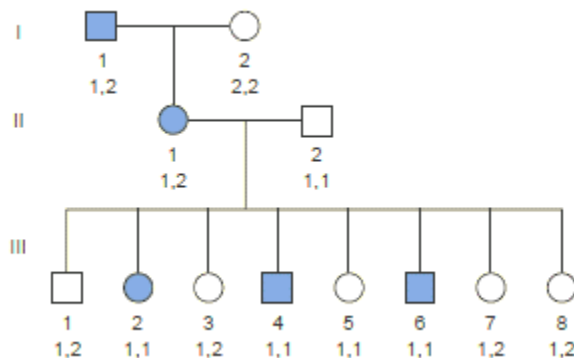
Or

What are the different types of structural alteration of chromosomes? Write their behavior during meiosis. 5+5=10

3. Workers and queens of honey bees are genetically the same but phenotypically very different. Explain the genetic basis of this phenotypic difference along with chart showing developmental patterns of these two types of phenotypes. 10

Or

An autosomal dominant disease is being transmitted in the pedigree in the following figure. A two-allele marker has been typed for each family member. Calculate the LOD score for the 0.125 recombination frequency. 10



4. For alleles 'A' and 'a', relative fitness values are $W_{AA} = 0.6$, $W_{Aa} = 1$, and $W_{aa} = 0.4$. Calculate the allele frequencies at equilibrium. 10

Or

Using the relationship, $(1 - \mu)^t = \frac{p_t}{p_0}$ in a hypothetical example, show that the rate of new mutation is not a significant reason for change in allele frequencies of populations but Random Genetic Drift via bottleneck effect can quickly change the allele frequencies. 10

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Name of Programme : M.Sc. Botany
Semester : 2nd
Paper Code : BOT-510
Paper Title : Ecology and Environment
Full Marks : 40

*The figures in the margin indicate full marks for the questions.
Answer all questions.*

1. Define ecosystem. Describe the biotic and abiotic components of any freshwater ecosystem studied by you. 2+8= 10

Or

Define biogeochemical cycles. How human activities could affect these cycles? 2+8 = 10

2. What is resource partitioning? By giving examples, describe the different types of differential resource partitioning. 2+8 = 10

Or

Describe plant species stratification in the aquatic ecosystem with a neat labelled diagram. 10

3. Define population. Give a concise account of various characteristics of a population. 2+8=10

Or

Write notes on 5+5=10

- a. r- and k-selected species
- b. concept of metapopulation.

4. Explain the in situ and ex situ bioremediation with their merits and demerits. 10

Or

What are the principal steps in the depletion of stratospheric ozone? Mention some of the effects on terrestrial and aquatic ecosystems. 5+5 = 10

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Name of Programme : M.Sc. Botany
Semester : 2nd
Paper Code : OPE-002
Paper Title : Bioethics
Full Marks : 40

*The figures in the margin indicate full marks for the questions.
Answer all questions.*

1. Describe '**Virtue ethics**'. State the differences between **Virtue ethics** and **Consequentialism**. 7+3 = 10

Or

Write the relationship between virtue and duty as well as virtue and happiness. 5+5 = 10

2. Do you think that therapeutic cloning is ethically acceptable? Explain your answer. 10

Or

Describe the ethical issues of cloning animals. 10

3. Write the aim and objectives of the Bio-Cassava Project. Present some ethical issues of transgenic Cassava. 3+4+4 = 10

Or

Illustrate the potential amenities of having a universal DNA database. Explain one possible bad consequence of having such a database. 7+3 = 10

4. State the types and significance of Intellectual property rights (IPR) 5+5 = 10

Or

- a. What is a patent and why is it important?
b. Shall we allow patents on living organisms? Give your arguments in support of your answer. 5+5 = 10
