



বিদ্যাসাগর বিশ্ববিদ্যালয়

VIDYASAGAR UNIVERSITY

M.Sc. Examinations 2020
Semester IV
Subject: BOTANY
Paper: 403 (Special Paper)
(Theory)

Full Marks: 40

Time: 2hrs.

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

Special paper: 403A: Molecular Systematics

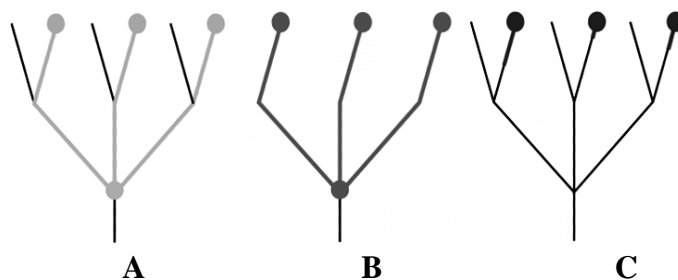
Answer any one of the following questions from your allotted special paper (within 250 words):

1. Differentiate between:

- a) cpDNA and mtDNA
- b) rDNA and ITS
- c) RAPD and AFLP

2. What is taximetrics? Who first coined this term? Mention its objectives and principles. What is OTU and unit characters?

3. What are Phenetic and Cladistic methods? Analysis the phylogeneic tree provided and comment on the type (A, B and C)





4. Write the concept of cladogram with reference to principle of parsimony.
5. Write down the distribution, adaptive features and phylogeny of Parasitic Taxa.
6. Write down the distribution, adaptive features and phylogeny of Insectivorous Taxa.
7. Write down the distribution, adaptive features and phylogeny of Mangrove Taxa.
8. What are Endangered & Threatened plants as per IUCN?
9. Name ten (10) Aromatic and Dye yielding Medicinal Plants.
10. What is adulteration? Give five examples based on medicinal herbs.
11. What are the differences between traditional and digital herbarium? Write the concept and application of digital herbarium.
12. What is cluster analysis? How do you determine a phenetic structure?

Special Paper 403B: Molecular Biology & Biotechnology

Answer any one of the following questions (within 250 words):

1. Discuss on three basic conformations of DNA.
2. Write briefly on virus resistant transgenic plant.
3. Briefly state on c value and its paradox.
4. Comment on DNA renaturation kinetics.
5. Write a brief note on DNA repair mechanism.
6. Describe gene cloning method.
7. Describe the structure of Ti plasmid.
8. State the principle of electroporation and its application.
9. What is the working principle of gene gun?
10. Write short note on suspension culture and its significance.
11. Comment on DNA repair mechanisms.
12. Give a note on progeny testing. .

Special Paper 403C: Biodiversity

Answer any one of the following questions (within 250 words):

1. Write down Economic role of Biodiversity.
2. Mention Different threats to Indian Biodiversity.
3. What are different types of *in-situ* conservation of Biodiversity?
4. Mention *ex-situ* conservation and its significance.
5. Mention role of Botanical Gardens in plant conservation.
6. Discuss importance of Red Data Book.
7. Mention Biological Hot Spots and their significance.
8. Define Biodiversity. Write down total number of different plant taxa reported till date (algae to angiosperm).



9. Mention role of Ramsar sites in conservation.
10. Write a note on Sacred grove.
11. Mention role of Botanical Survey of India (BSI) in plant conservation.
12. Discuss biodiversity conservation act 2006.

Special Paper : 403D: Microbiology – Applied

Answer any one of the following questions (within 250 words):

1. Mention advantages of probiotics.
2. Discuss different parts of a fermentor.
3. Mention mode of action of Bt toxin.
4. Mention different strategies of controlling air microorganisms.
5. Write down process of leaching of copper by microorganisms.
6. Write short note on vaccine.
7. What are different applications of bioinformatics?
8. Discuss secondary sewage treatment.
9. Discuss different parts of IgG.
10. Mention stages of cheese preparation.
11. Mention production process and uses of glutamic acid.
12. Write a note on trickling filter bed.

Special Paper: 403E: Plant Pathology

Answer any one of the following questions (within 250 words):

1. Comment on diagnosis of infectious diseases.
2. Define prepenetration.
3. Describe general principles of plant disease control.
4. Discuss different types of timber decay.
5. Enumerate mycorrhiza and disease control.
6. Write about development of disease resistant transgenic plants.
7. Enumerate root rot of teak.
8. Write a note on meristem tip culture.
9. Discuss root rot of Sal.
10. Write a note on protoplast culture.
11. Comment on bacterial wilt of Teak.
12. Describe wilt of Sissoo.



Special Paper: 403F: Palynology & Plant Reproductive Biology

Answer any one of the following questions (within 250 words):

1. Briefly discuss the structure of pollen wall. Write its chemical nature.
2. Explain the cause of allergy in human system by pollen grains.
3. Briefly describe the Quaternary vegetational history of Kashmir valley through pollen analysis.
4. Discuss briefly the Holocene vegetational history of Bengal basin through pollen analytical methods.
5. Discuss the process of formation of natural coal.
6. Briefly describe different ranks of coals occurred in nature.
7. Briefly discuss the role of palynology in palaeogeography reconstruction.
8. Discuss the role of palynology in studying source rock potential.
9. What is meant by pollination? Write notes on Herkogamy, Dichogamy, Monoecy and Dioecy.
10. Categorize flower types with reference to their shapes according to Kugler (1970) and Faegri & van der Pijl (1979).
11. Briefly discuss about flower attractants and floral rewards.
12. Discuss about the different adaptive floral traits which are being pollinated by bees and birds.

Special Paper 403G: Biochemistry and Molecular Biology

Answer any one of the following questions (within 250 words):

1. What is the biochemical difference between Carotene and Xanthophyll? Describe the biosynthetic pathway of carotenoids mentioning the enzymes involved.
2. Enumerate the amino acid biosynthetic families grouped on the basis of metabolic precursors. Schematically represent the biosynthesis of Tryptophan.
3. Briefly describe the simple to higher order structural organisations of proteins.



4. What are chaperones? Mention the properties and mechanism of action of chaperones.
5. Discuss assisted protein folding using DnaK-DnaJ system.
6. What is cAMP? Describe the synthesis and function of cAMP as second messenger.
7. Classify amino acids on the basis of chemical properties. What are essential and nonessential amino acids?
8. Name the types of signalling molecules in signal transduction pathway. Briefly describe the different types of hormones that play important role in signal transduction.
9. Describe the structure and mechanism of GroEL-GroES protein folding machine.
10. What is functional genomics? Describe few techniques that are applied for transcriptome profiling at the RNA level.
11. Discuss the role of protein phosphorylation and dephosphorylation in signal transduction pathway.
12. Describe in detail any one technique of protein purification on the basis of molecular weight.