



বিদ্যাসাগর বিশ্ববিদ্যালয়

**VIDYASAGAR UNIVERSITY**

**M.Sc. Examinations 2020**

**Semester IV**

**Subject: BOTANY**

**Paper: 495 (Special Paper)**

(Practical)

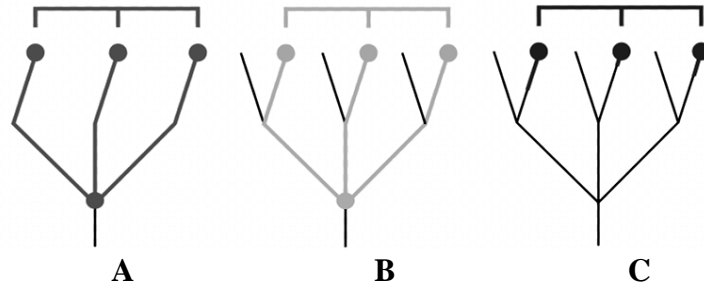
**Full Marks: 50**

**Time: 3hrs.**

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

**Special paper: 495: Angiosperm Taxonomy & Molecular Systematics:**

1. Write down the methodology of taxonomic study of unknown plants of local flora?
2. How to prepare identification 'Keys' and identification of an unknown plant by use of keys and matching?
3. Write short notes on Index Kewensis, Dictionaries, Manuals, Bibliographies and Flora which are commonly used in practical classes.
4. How to work out the inter /and intraspecific morphological variations?
5. How can you make a comparative study of the starch grains on different storage organs?
6. Make a comparative study of the stomata of different leaves and stems?
7. How can you make a comparative study of the ovules of different flowers?
8. Analysis the three (03) phylogenetic trees provided (A, B & C) and comment on the type (Polyphyly, Paraphyly and Monophyly).



9. How can you work out pollen morphology of angiospermic taxa?
10. How to determine the inter-/ intraspecific and intergeneric variation based on palynological studies with the help of the NPC system?
11. How to prepare the separating and stacking gel for SDS-PAGE?
12. How to prepare a typical herbarium for final submission in the examination?

### Special Paper 495: Cytogenetics & Biotechnology

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

1. Mention the roles of pretreating agents for karyotype studies.
2. What are the major function and other associated functions of fixatives used in fixing tissue for cytological studies?
3. Write the procedure for preparing a stain to work out karyotype.
4. Enumerate the steps to work out karyotyping of a species.
5. Illustrate the symmetric and asymmetric karyotype with the help of suitable figures.
6. How meiotic metaphase I can be distinguished from metaphase II?
7. Enumerate the steps for studying meiosis with right material of choice.
8. Briefly describe the stages of meiotic division responsible for chromatid separation.
9. Explain briefly the phenomena of cytomixis.
10. Mention the situation when regression analysis is useful.
11. State the procedure of regression analysis.
12. Comment on the use of ANOVA analysis.

### Special Paper 495: Ecology & Biodiversity

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

1. How plant communities are studied through quadrats and transects?
2. Write utility of using quadrats in IVI study.
3. What aspects of plants are interpreted through studying ecological anatomy?
4. State importance of studying chemical characteristics of soil.



5. Why field based ecological studies are done.
6. How do you study abundance of plant population.
7. How do you study frequency of plants.
8. Write significance of studying IVI.
9. Mention anatomical adaptive features of *Peperomia pellucida*.
10. Mention anatomical adaptive features of *Casuarina equisetifolia* leaf.
11. Mention anatomical adaptive features of *Ipomoea aquatica*.
12. Mention anatomical adaptive features of *Enhydra flactuans*.

**Special Paper : 495 Microbiology: Basic & Applied**

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

1. Mention the utility of the study of fermentation of sugar by different bacteria.
2. Write down the principle of starch and protein hydrolysis experiment.
3. How microbial assay of streptomycin can be done in a laboratory?
4. How survival curve of a bacterium can be done after UV exposure?
5. What are the different components added in polymerase chain reaction (PCR) mixture?
6. How MIC of an antibiotic is determined against different bacteria?
7. How phylogenetic tree can be made through BLAST?
8. How microbial growth curve can be prepared in a laboratory?
9. Mention different requisites for estimation of protein.
10. How amino acid pool of an organism can be determined by TLC?
11. How molecular weight of a protein can be determined by gel electrophoresis?
12. Write down the process for isolation of plasmid from bacteria.

**Special Paper: 495 Mycology & Plant Pathology**

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

1. Write a note on the preparation of fungal media.
2. Comment on the isolation of fungi from water.
3. Discuss about the isolation of fungi from soil.
4. Comment on the isolation of fungi from air.
5. How do you study ectomycorrhiza?
6. Mention the procedure of study of VAM.
7. Discuss on the morphological and reproductive structures of *Fusarium*.



8. Comment on the morphological and reproductive structures of *Cercospora*.
9. Discuss on the morphological and reproductive structures of *Clavaria*.
10. Comment on the morphological and reproductive structures of *Erysiphe*.
11. Mention the morphological and reproductive structures of *Peronospora*.
12. Discuss different sterilization processes.

**Special Paper: 495: Palaeobotany, Palynology & Plant Reproductive Biology**

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

1. Discuss the importance of field visit for palaeobotanical studies. Write some field techniques used during study of palaeobotany.
2. How megafloral assemblages of Lower Gondwana help in determining the actual age of occurrence of those fossil plants?
3. How megafloral assemblages of Middle Gondwana help in determining the actual age of occurrence of those fossil plants?
4. How megafloral assemblages of Upper Gondwana help in determining the actual age of occurrence of those fossil plants?
5. Discuss in detail the acetolysis technique (Erdtman, 1960) to study angiosperm pollen morphotypes.
6. Describe in detail the method of extraction of pollen grains from honey samples which are used in melissopalynological studies.
7. Discuss in detail the method of extraction of pollen grains from soil samples.
8. Write the pollen morphological features of the following taxa: Arecaceae, Poaceae, Amaranthaceae and Malvaceae.
9. Describe the method of *in-vitro* pollen germination and pollen tube growth.
10. Describe the *in-vitro* and *in-situ* method of pollen viability test.
11. Discuss the method of self incompatibility tests in flowering plants.
12. Describe the method of slide preparation from petrified plants.

**Special Paper 495: Plant Physiology, Biochemistry & Molecular Biology**

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

1. Write the principle and technique of Quantitative estimation of ascorbic acid in plant tissue.
2. Describe the principle and importance of seed viability test using TTC.



3. Mention the principle and procedure of extraction and estimation of fat from plant tissue.
4. Write the procedure of protein analysis by SDS-PAGE.
5. Write the procedure of extraction of nucleic acids from plant samples.
6. Briefly describe the procedure of estimation of catalase extracted from normal and heat-stressed plant tissue.
7. Briefly describe the principle and chemicals required for estimation of amylase.
8. Write the principle and procedure of separation of phenolic compound from plant tissue using thin layer chromatography.
9. Write the principle and procedure of separation of amino acids by paper chromatography.
10. Describe the procedure of extraction and estimation of sugar from plant tissue.
11. How can you estimate Iron by using colorimetry?
12. Mention the experimental procedure of the effect of water stress on root metabolic activity.