



বিদ্যাসাগর বিশ্ববিদ্যালয়

VIDYASAGAR UNIVERSITY

M.Sc. Examinations 2020
Semester IV
Subject: BOTANY
Paper: 402 (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: 402A: Angiosperm Taxonomy

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

1. Differentiate between:
 - a) Monophyly and Polyphyly
 - b) Flora and Vegetation
 - c) Convergent and Divergent Evolution
2. Differentiate between ICBN and ICN.
3. What is biodiversity? What are the basic differences between biodiversity and mega-diversity?
4. What are the differences between *Ex-situ* and *In-situ* conservation? Explain with suitable examples? How many biosphere reserves are there in India?
4. What are the basic differences between traditional system, integrated system and APG system of classification?



5. What is endemism? What are the basic differences between disjunction, invasions and introductions? Explain with suitable examples.
6. What are the basic concepts of Palaeoherbs and Eudicots? Give suitable examples.
7. What is Cryopreservation? Write short notes on seed bank and pollen bank.
8. What is Germplasm conservation? Write a short note on Gene bank.
9. Mention the significance of phyto-chemistry in deciphering taxonomic position of taxa.
10. Write two important contributors (taxonomist) and their contributions on taxonomic literature in relation to Angiosperms.
11. Define Sero-taxonomy? Who first proposed this terminology? Mention the role of sero-taxonomical studies in solving taxonomic problems.
12. Write down five important medicinal plants of Jangal-Mahal area and mention their importance.

Special Paper 402B: Cytogenetics

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

1. Write on the chemical constituents of plasma membrane.
2. Give a brief account of cell surface receptors.
3. Describe the structural features of plasma membrane.
4. Write briefly on different components of cytoskeleton.
5. Illustrate the cell cycle check points.
6. Write a short note on cyclins and cyclin dependent kinases.
7. Illustrate sympatric speciation.
8. Compare parapatric and peripatric speciation.
9. How population bottleneck and genetic drift are related?
10. Illustrate Hardy Weinberg Principle.
11. Write a short note on cell signaling.
12. Define Broad sense and Narrow sense heritabilities.

Special Paper 402C: Ecology

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

1. Write different Mangrove adaptations.
2. Discuss significance of 5th June.
3. Discuss ecological effects of El Nino.



4. Write notes on Bhopal disaster.
5. Briefly discuss about Acid rain.
6. Write notes on Ozone hole.
7. Write notes on Invasive species.
8. Mention significance of Phytoremediation.
9. Give an account of environmental stress.
10. Mention characteristics of population.
11. Comment on r-strategy and k- strategy.
- 12.** Briefly discuss Montreal protocol.

Special Paper : 402D: Microbiology – Basic

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

1. Write down general characteristics of Actinomycetes.
2. Discuss diauxic growth with example.
3. Briefly discuss chemosynthesis with example.
4. Write short note on photosynthetic microorganism.
5. Discuss structure of the nitrogenase.
6. Mention structure and function of leg-haemoglobin.
7. Write briefly about c-DNA library formation.
8. Mention role of oncogenes in cancer formation.
9. Write down mode of action and applications of amylase.
10. Mention purification steps for viruses.
11. Write down different mechanisms of drug resistance found in bacteria.
12. Mention stages of biofilm formation.

Special Paper: 402E: Applied Mycology



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

1. Discuss spindle pole body.
2. Explain heterokaryosis.
3. Comment on exogenous dormancy.
4. Describe endogenous dormancy.
5. Enumerate the role of fungi in nutrient recycling.
6. Discuss SCP.
7. Illustrate the role of fungi as biofertiliser.
8. What do you know about marmite?
9. Write about fungal siderophores.
10. Comment on vegemite.
11. Discuss the role of PSF.
12. Discuss Quorn.

Special Paper: 402F: Palaeobotany

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

1. Classify rocks according to their origin and composition.
2. Briefly discuss the process of formation of sedimentary rocks.
3. What is meant by stratigraphy? How stratigraphic deductions of an area of any extent can be worked out?
4. Describe briefly about Lithostratigraphy.
5. How Time stratigraphy and Biostratigraphy helps in determining the age of the rocks?
6. Discuss the earliest known life forms that were met with during Precambrian?
7. Briefly describe the mega-floral succession during Siluro-Devonian period.
8. Discuss briefly the early Mesozoic floras of Molteno and Chinle formation.
9. What is meant by Indian Gondwana Sequence? Classify bi-partite system of Indian Gondwana.
10. Describe the miofloristics of Barakar and Raniganj formations.
11. Describe the megafloristics of Parsora and Hartala Hill formations.
12. Write a note on stromatolites.

Special Paper 402G: Plant Physiology



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

1. Describe the genes and polypeptide components of Light Harvesting Complex.
2. Name a plant growth regulator associated with floral development. Briefly describe the genes that regulate floral development.
3. Write a short note on structure and function of nitrate assimilating enzyme.
4. Briefly discuss about the structure of chloroplast and its role in genetic engineering.
5. Mention two major classes of membrane transport proteins. Schematically represent the functioning of $\text{Na}^+ - \text{K}^+$ Pump.
6. Enumerate the physiological role and commercial uses of Auxin.
7. Briefly describe the molecular responses of plants against biotic stress.
8. Describe the ABC model of floral development.
9. Write short notes on Jasmonic acid and Brassinosteroids.
10. What are the different types of senescence patterns? Write a short note on Programmed Cell Death in respect to senescence.
11. What are stress proteins? Write a short note on Heat Shock Proteins.
12. Describe the electron carriers and mechanism of ATP generation in chloroplast.