

# Sitaram Samarpan Mahavidyalay, Naraini Banda

## B.Sc First Year -Botany

### First Paper

#### Short question

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- 1- Tobacco Mosaic Virus
- 2- Cell structure Cyanobacteria
- 3- Nature of Viruses
- 4- Draw well labeled diagram of Mycoplasma
- 5- Dwarf male
- 6- Economic importance of lichens
- 7- Late blight of Potato
- 8-Edible fungi
- 9- Cell structure of Yeast
- 10-Synzoospore
- 11-Cercospora
- 12-Bacteriophage
- 13-Citrus Canker
- 14-Sexual Reproduction in Volvox
- 15-Apothecium of Peziza
- 16-Lichen
- 17-Algal pigment

- 18-Economic importance of algae
- 19-Basidium
- 20-Male conceptacle of Sargassum
- 21-Dwarf male
- 22-Unilocular and Plurilocular sporangia
- 23-Cystocarp
- 24-Red rot of sugarcane
- 25-Bacterial nutrition

### **Long question**

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- 1-Describe the Post fertilization changes in the life history of Polysiphonia?
- 2- Describe the sexual reproduction in Vaucheria?
- 3- Describe the genetic recombination in Bacteria?
- 4- Describe various types of spores in Puccinia graminis?
- 5- Write economic importance of Bacteria?
- 6- Describe life cycle of Volvox giving suitable diagram?
- 7- Describe economic importance of fungi?
- 8- Describe internal structure and frutification of Agaricus?
- 9- Describe the life cycle of Ectocarpus with the help of labeled diagram?
- 10-Explain the process of cell division and sexual reproduction in Oedogonium?
- 11-Explain the asexual reproduction in Volvox with suitable diagram?
- 12-Describe the plurilocular and unilocular sporangia in Ectocarpus?

## Second Paper

### Short question

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- 1- Inversion of archegonia in Marchantia.
- 2- Calyptra
- 3- Morphological nature of sporocarp
- 4- Heterospory
- 5- Gemma cup
- 6- Horsetail
- 7- Prothallus of lycopodium
- 8- Trabeculae
- 9- Stellar structure in equisetum stem
- 10- Mass capsule
- 11- Rhynia
- 12- Rhizophore
- 13- T.S. of marsilea petiole
- 14- T.S. of marsilea rhizome
- 15- Dispersal of spores in funaria
- 16- Parthenogenesis
- 17- Alternation of generation
- 18- Protonema
- 19- Peristome of moss
- 20- Internal structure of selaginella stem

### Long question

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- 1- Describe the detail about the various types of spores in pteridophyta ?
- 2- Describe the life cycle of equisetum ?
- 3- Describe various types of vegetative propagation in bryophyte ?
- 4- Write an essay on heterospory and seed habit ?
- 5- Write an essay on economic importance of pteridophyta ?
- 6- Describe the life cycle of marchantia with the help of suitable diagram ?
- 7- Give an illustrated account of different types of gametophytes in lycopodium ?
- 8- Describe the sporophyte of funaria ?
- 9- Describe in detail about spore producing organ of marsilea ?
- 10- Describe the sexual reproduction in selaginella ?
- 11- Draw the well labeled diagram of the following -----  
A- V.L.S. of marchantia sporophyte.  
B- L.S. of anthoceros sporophyte .
- 12- Explain vegetative and reproductive organs of Rhynia ?

## **Third Paper**

### **Short question**

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- 1- Duplication
- 2- Cell cycle
- 3- Nucleolus
- 4- Ribosome
- 5- Nucleoside
- 6- Endoplasmic reticulum
- 7- Plasmids
- 8- Clover leaf model
- 9- DNA damage and DNA repair
- 10- Genetic code
- 11- Transposons
- 12- Aneuploidy

- 13- Sex chromosome
- 14- Inversion
- 15- Central dogma
- 16- Linkage
- 17- Nucleosome concept
- 18- Polyploidy
- 19- Lethal gene
- 20- Mitochondria
- 21- Epistasis

## Long question

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- 1- What is the role of DNA and RNA in protein synthesis ?
- 2- Describe the double helical structure of DNA with the help of suitable diagram ?
- 3- Describe the mendels law with suitable examples ?
- 4- What is mutation ? Describe the types of mutation ?
- 5- Describe the meiotic cell division only by labeled diagram ?
- 6- What is polyploidy ? Describe different types of polyploids ?
- 7- Describe the primary, secondary and tertiary structure of protein ?
- 8- What is plasma membrane ? Describe its structure with the help of suitable diagrams ?
- 9- Give an account of the structure of nucleus ?
- 10- Describe the mitotic cell division ? with the help of labeled diagrams ?

**Sitaram Samarpan Mahavidyalay, Naraini Banda**

# **B.Sc Second Year- Botany**

## **First Paper**

### **Short Questions**

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1. Heterospory and seed habit.
2. Economic important of gymnosperm.
3. Name all six species of cycas in india.
4. Cycas a living fossil.
5. Coralloid root of cycas.
6. Leaf traces of cycas stem.
7. Leafs of cycas.
8. Male strobilus of cycas.
9. Economic importance of Pinus.
10. Vascular tissue of pinus needle.
11. Draw labeled T.S. of pinus needle.
12. Name all species of pinus found in india.
13. T.S. young stem of ephedra.
14. Male and female cone of ephedra.
15. L.S. ovule of ephedra.
16. Seed of ephedra.
17. Double fertilization in ephedra.
18. Labelled diagram of longitudinal section of Sago-palm.
19. Double fertilization in gymnosperm.

## Long Questions

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1. Give the characteristic features and affinities of gymnosperm.
2. Write an essay on the contribution of Indian botanist of gymnosperm.
3. Describe the classification of gymnosperm.
4. Give a comparative account of male gametophyte of pinus and cycas.
5. Describe the development of female gametophyte of cycas.
6. Megasporophyll of cycas and pinus.
7. Secondary growth in stem of cycas and pinus.
8. Seed of cycas and ephedra.
9. Describe the pollination, fertilization and seed formation in cycas and pinus.
10. Describe the life cycle of cycas.
11. Describe reproduction and life history of cycas.
12. Describe the structure of female cone of ephedra. Explain the development of female gametophyte in it.
13. Write an essay of seed habit.
14. Describe the life cycle of ephedra with labeled diagram only.
15. Give an illustrated account of male and female reproductive organs of ephedra.

## Second Paper

### Short Questions

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1. Differentiate between rutaceae and Acanthaceae.
2. Inflorescence of poaceae.
3. Taxonomic ranks and importance of taxon.
4. Type concept.
5. Principle of botanical nomenclature
6. Pollinia
7. Gynostegium
8. Siliqua.

9. Tetradynamous.
10. Obdiplostemonous condition of stamens.
11. Verticillaster inflorescence.
12. Axile and parietal placentation
13. I.C.B.N.
14. Cytological studies in taxonomy.
15. Holotaxonomy.
16. Some examples of primitive angiosperm.
17. Floral diagram of Liliaceae and Poaceae.
18. Draw floral formula of Asclepiadaceae and Solanaceae.
19. Cyathium inflorescence.
20. Describe the pollination in Salvia.
21. Capitulum
22. Merits and demerits of Bentham and Hooker system of classification.
23. Numerical taxonomy. Basis of phylogenetic system of classification.
24. Basal placentation.
25. Floral characters of Brassicaceae.
26. Rules of priority.
27. Merits and demerits of Engler and Prantle classification.
28. Alpha and beta taxonomy
29. In which family staminodes are found, give its floral formula

## Long Questions

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1. Describe the family Poaceae.
2. Role of phytochemistry in modern taxonomy.
3. Describe Hutchinson's system of classification.
4. Write characteristics of family Ranunculaceae. Give two examples of plants and draw diagrams and floral formula.
5. Give floral formula, floral diagram and family of any three of the following.
  - a. Calotropis
  - b. Delphinium
  - c. Solanum
  - d. Triticum



6. Describe the contribution of cytology, phytochemistry and taxometrics to taxonomy.
7. Describe the range of inflorescence in family euphorbium.
8. What is numerical taxonomy? How it is helpful if solving taxonomic

## Third Paper

### Short Questions

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1. What is abscission layer? How is it formed.
2. Cellular endosperm.
3. What is double fertilization?
4. Structure and function of tapetum.
5. Explain tunica-carpus theory with suitable diagram.
6. Differentiate between heart wood and sap wood.
7. What is cork. Explain its formation in brief.
8. Ornithophily.
9. Self incompatibility.
10. Bark grafting.
11. Polygonum embryo sac.
12. Quiescent centre concept.
13. Role of woody skeleton.
14. Commercial cork.
15. Vascularization of primary shoot.
16. Phyllotaxy.
17. Respiratory roots.
18. Annual rings.
19. Velamen tissue.
20. Respiratory roots.
21. Grafting.
22. Histogen theory.

23. Tetrasporic embryo sac.
24. Endogenous dormancy.
25. T budding
26. Karper-kappe theory.
27. Totipotency.
28. Formation of bark.
29. Syngamy.
30. Modular growth.
31. Shoot apical meristem.

## Long Questions

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1. What is the role of ecological adaptation in the dispersal of fruits and seeds.
2. What do you understand by fertilization.
3. What is wood .describe its structure in relation to conduction of water.
4. What is seed dormancy. Discuss the the cause of seed dormancy.
5. What is anomalous secondary growth. Draw neat diagram to illustrate such growth in monocote stem.
6. What is secondary growth. Describe the activity of inter and intrafascicular cambium in dicotyledonous stem.
7. What is annual ring . give a brief description of their specific feature.
8. Discuss structure and development of embryo sac in angiosperm.
9. What is endosperm. Describe its development and functions with the help of suitable sketches.
10. Describe the development of male gametophyte in an angiospermic plant.
11. Describe the development of a dicotyledonous embryo giving suitable diagrams.

# Sitaram Samarpan Mahavidyalay, Naraini Banda

## B.Sc Third Year-Botany

### First Paper

#### Short Questions

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1. Co-enzyme
2. Plant pigments.
3. Effect of ethylene.
4. R.Q.
5. Embden mayerhof pathway.
6. Kranz anatomy.
7. Munch hypothesis.
8. Dixon jolly theory.
9. Florigen concept of flowering.
10. Glycolate metabolism in plants.
11. Osmosis.
12. Role of abscisic acid.
13. Beta oxidation.
14. Difference between guttation and transpiration.
15. Z-scheme.
16. CAM plant.
17. Hill reaction.
18. Biological clock.
19. Oxidative phosphorylation.
20. Fixation of nitrogen.
21. H.M.P. shunt.
22. Significance of T.C.A. cycle.
23. Wilting.
24. Difference between C<sub>4</sub> and C<sub>3</sub> cycle.
25. Trace element.

26. Dormancy.
27. Vernalization.
28. Guttation.
29. Short day plant.
30. Active and passive absorption.
31. Photoperiodism.
32. Hydathodes.
33. Emerson effect.
34. Hydropoics.
35. Characteristics of phytochromes.
36. Macronutrients.
37. Hydrotropism.
38. Mechanism of stomatal movement.
39. Difference between transpiration and evaporation.
40. Characteristics of enzyme.

## **Long Questions**

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1. What do you understand by translocation of organic solutes. Describe path, mechanism, evidence and theory of translocation in plants.
2. What are plant hormones. Describe structure, occurrence its physiological/morphological effects and agricultural uses of auxins or gibberellins.
3. What is photophosphorylation. Explain its importance in plants. Describe cyclic and non-cyclic photophosphorylation.
4. Describe kreb's cycle in plants. Explain the relation of krebs cycle to electron transport system.
5. What do you understand by aerobic and anaerobic respiration. Describe the process of glycolysis in details.
6. Describe dark reaction of photosynthesis and discuss path of carbon in it.
7. Describe the theory of  $K^+$  transport and hormones regulation for opening and closing of stomata.

8. What are ascent of sap. Describe the cohesion theory of explain its mechanism with suitable diagram.
9. What is cytokinins. Discuss their importance to plants.
10. Describe role of hormones in flower initiation.

## **Second Paper**

### **Short Questions**

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1. Comments upon objects of ecology.
2. How does energy flow in ecosystem.
3. Explain pyramid of biomass.
4. Food chain.
5. Comments upon physiological characters of xerophytes.
6. Salinity.
7. Ecotype.
8. Soil profile.
9. Ecological pyramid.
10. Difference between primary and secondary consumer.
11. Biotic component.
12. Anatomical adaptation in hydrophytes.
13. Write short notes on heliophytes and sciophytes plants.
14. Pneumatophores.
15. Notes of ecades and ecotype.
16. Raunkiaer's life form.
17. Characteristic of community.
18. Differentiate between lianas and epiphytes.
19. Describe briefly physiological adaptations of xerophytes and mesophytes.
20. Food web.

21. Photoperiodism
22. Halophytes.
23. Biological spectrum.
24. Humification.
25. Tidal forest.
26. West Indian deserts.
27. Light compensation and light saturation points.
28. Importance value index.
29. Ecesis.
30. Nitrogen cycle.
31. Grass land vegetation.
32. Structure of atmosphere.
33. Hydrological cycle.
34. Green house effect.
35. niche

## Long Questions

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1. What is plant succession? How plant succession takes place in a lake. Explain with suitable diagrams?
2. What do you understand by biogeochemical cycle? Describe global biogeochemical cycle of C,N,P?
3. What do you mean by ecosystem? Describe types of Pyramids?
4. Describe adaptation in hydrophytes?
5. Describe biogeographical region in India?
6. Describe energy flow in ecosystem?
7. Describe in brief different phytogeographical region in India?
8. Describe briefly the ecological condition of different biogeographical region in India?

# Third Paper

## Short Questions

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- 1- Describe role of plasmid as vectors?
- 2- Write short notes on chromosome walking?
- 3- Write short notes on restriction endonucleases?
- 4- Write short notes on cloning vector?
- 5- Write short notes on Organogenesis?
- 6- Write short notes on structure and function of Ti and Ri plasmids?
- 7- Write short notes on importance of agrobacterium?
- 8- Write short notes on virus vector?
- 9- Write short notes on transposons?
- 10- Write short notes on Jute and Bamboo?
- 11- Write short notes on biotechnology?
- 12- Explain marker gene?
- 13- Write short notes on Bt-Cotton?
- 14- Write short notes on Transgenic plants?
- 15- Write the botanical name and families of following-
  - A- Margosa tree
  - B- Dil ki dava and Pagal ki dava
  - C- Yellow gold
  - D- China badam
- 16- Write the name of four crops which are the gift of to new world to old world?
- 17- Write short notes on PCR?
- 18- Write short notes Timber
- 19- Define tissue culture?
- 20- Hybridoma technology?
- 21- DNA finger printing
- 22- cDNA library
- 23- Chromosome jumping
- 24- Callus

- 25- High yielding varieties of Rice
- 26- Anther culture
- 27- Embroids
- 28- Marker gene
- 29- Tea plantation in India
- 30- Gene mapping

## Long Questions

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- 1- What is biotechnology? Discuss the different area of study which can be included in the biotechnology?
- 2- What do you understand by recombinant DNA technology?
- 3- Write down common and botanical names their families and the plant part used of any ten species cultivated in India?
- 4- Givw detail account of Five timber yielding plants
- 5- What is plant tissue culture? How it is useful in different areas of biotechnology.
- 6- Write on assay on importance of agrobacterium in biotechnology.
- 7- Write the botanical name, families, part uses and uses of five important medicinal plants.
- 8- Describe the origin, distribution, botanical characters, cultivation, harvesting and important varieties of wheat.
- 9- What are fiber. Describe the sources, characteristics classification and use of cotton and jute.
- 10- Give the detail of cultivation, important varieties and importance of potato.