

Nalanda Open University
Annual Examination - 2020
B.Sc. Botany (Honours), Part-I
Paper-I

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. Describe the structure and reproduction of *Chlamydomonas*.
2. Describe the structure and reproduction of *Oedogonium*.
3. Describe life cycle of *Alternaria*. Name its importance.
4. Give an account of structure and mode of reproduction in Rust on Wheat.
5. What is Isomorphic alternation of generation? Explain with reference to life cycle of *Ectocarpus*.
6. Describe the sporophyte of *Anthoceros*.
7. Write short notes on any four of the following :
 - (a) Heterospory
 - (b) Dispersal of spores in Bryophytes
 - (c) Structure of Synangium
 - (d) Fruiting body of Ascomycetes.
 - (e) Prothallus of *Lycopodium*
8. Describe with suitable diagram, types of stele found in Pteridophyta.
9. Write short notes on the following:
 - (a) Lichen
 - (b) Mycorrhiza
 - (c) Palmella stage
 - (d) *Anabaena*.
10. Describe briefly life cycle of *Sphagnum*.



Nalanda Open University
Annual Examination - 2020
B.Sc. Botany (Honours), Part-I
Paper-II

Time: 3.00 Hrs.

Full Marks: 80

*Answer any **Five** questions. All questions carry equal marks.*

1. Describe the economic importance of Gymnosperm.
2. How female gametophyte to *Taxus* develop? Describe sequentially.
3. Describe main angiospermic characters of *Gnetum*.
4. Describe various methods of fossilization.
5. Give an account of the structure of strobilus of *Rhynia*.
6. Write the floral formula and floral diagram of family *Ranunculacea*. Name two plants of this family.
7. Briefly describe classification of Angiosperm as proposed by Hutchinson.
8. Describe different types of fructification found in *Calamites*.
9. Write short notes on any **two** of the following:
 - (a) Transfusion issue
 - (b) Pollinium
 - (c) Strobilus of *Cycadeoidea*
 - (d) Palaeozoic period.
10. Describe development of female gametophyte of *Taxus*.



Nalanda Open University
Annual Examination - 2020
B.Sc. Botany (Subsidiary), Part-I
Paper-I

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. Describe the economic importance of Bacteria.
2. Describe the life cycle of *Vaucheria*.
3. Describe the structure and reproduction in *Chara*.
4. Give an account of the reproduction in Lichens.
5. Describe the life cycle of *Peziza*.
6. Describe the life cycle of *Selaginella*.
7. Describe briefly Hutchinson system of classification.
8. Give an account of development of male gametophyte of *Pinus*.
9. Write the floral character, floral formula and floral diagram of family Cucurbitaceae.
10. **Write short notes on the following:**
 - (a) Verticillaster
 - (b) Cyathium
 - (c) Heterocyst
 - (d) Gemma cup



Nalanda Open University
Annual Examination - 2020
B.Sc. Botany (Honours), Part-II
Paper-III

Time: 3.00 Hrs.

Full Marks: 80

*Answer **Five** questions, selecting atleast one question from each group A, B and C.*

All questions carry equal marks.

Group - A (Microbiology)

1. Describe ultrastructure and mode of reproduction in Bacteriophage.
2. Describe the role of Fungi in Industries.
3. Describe the process of Conjugation in Bacteria.
4. Give an account of degradation of Agriculture produce by microbes.

Group - B (Plant Pathology)

5. Describe the role of fungal enzymes in Pathogenesis.
6. Write notes on any two of the following:-
 - (a) Bacterial cell wall
 - (b) Ultrastructure of TMV
 - (c) White rust of crucifers
 - (d) Wart disease of Potato.
7. Give the symptom aetiology and control of Loose smut of Wheat.

Group - C (Embryology)

8. Give an account of development of megaspore in Angiosperms.
9. Describe any two the following:
 - (a) Double fertilization
 - (b) Tissue culture and its significance.
 - (c) Apomixis
 - (d) Parthenocarpy
10. What is Endosperm? How it develops.



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B.Sc. Botany (Honours), Part-II
Paper-IV

Time: 3.00 Hrs.

Full Marks: 80

*Answer Five questions, selecting atleast one question from each group A, B and C.
All questions carry equal marks.*

Group - A (Anatomy)

1. Describe anatomical features of Hydrophytes.
2. What do you mean by mechanical tissues in plants? Explain.
3. What is abnormal Secondary growth? Describe abnormal secondary growth in *Boerhaavia* stem.
4. Write short notes on any **two** of the following :
(a) Types of Xylem (b) Types of vascular bundle (c) Types of Phloem.
(d) Bark

Group - B (Cell Biology)

5. Describe ultrastructure of Chloroplast, mention function of each part.
6. Give an account of replication of DNA in Prokaryotes.
7. With the help of suitable sketches describe different stages of Mitosis. Mention significance of Mitosis.
8. Write short notes on any **two** of the following:
(a) Types of Carbohydrates (b) Types micronutrients
(c) Ultrastructure of chromosome (d) Different types of RNA

Group - C (Economic Botany)

9. Give an account of timber yielding plants of Bihar.
10. Write botanical name and family of:
(a) Two medicinal plants.
(b) Two pulse yielding plants
(c) Two edible fruits
(d) Two fibre yielding plants



Nalanda Open University
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B.Sc. Botany (Subsidiary), Part-II
Paper-II

Time: 3.00 Hrs.

Full Marks: 80

*Answer any **Five** questions. All questions carry equal marks.*

1. Describe anomalous secondary growth in *Dracaena* stem.
2. Describe different stages of mitosis with suitable diagrams.
3. Describe structure and functions of Chloroplast.
4. Describe the process of double fertilization in angiosperms.
5. Describe physical and chemical structure of DNA.
6. Describe Krebs's Cycle.
7. What is pollution? Write an essay on pollution.
8. Name any five oil yielding plants (Botanical names and family).
9. What is food chain? Describe any food chain studied by you, mentioning the trophic level.
10. Give botanical names and family of the following:
(a) Fruit yielding (Four) (b) Oil yielding plants (Four).



Nalanda Open University
Annual Examination - 2020
B.Sc. Botany (Honours), Part-III
Paper-V (Physiology and Biochemistry)

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. Questions No. 1 is compulsory. All questions carry equal marks.

1. Multiple choice questions:
 - (i) Transpiration is least in :
 - (a) Good soil moisture
 - (b) High wind velocity
 - (c) Dry environment
 - (d) High atmospheric humidity
 - (ii) Phenyl mercuric acetate (PMA) results in :
 - (a) Reduced transpiration
 - (b) $(a * e) = (a + e)$
 - (c) reduced respiration
 - (d) killing of plants
 - (iii) Movement of leaves of sensitive plant, *Mimosa pudica* are due to :
 - (a) thermonasty
 - (b) seismonasty
 - (c) hydrotropism
 - (d) Chemo nasty
 - (iv) Gibberellins promote :
 - (a) seed germination
 - (b) seed dormancy
 - (c) leaf fall
 - (d) root elongation
 - (v) Carbon dioxide joins the photosynthetic pathway in :
 - (a) PS I
 - (b) PS II
 - (c) light reaction
 - (d) dark reaction
 - (vi) Which of the following is located in the mitochondria ?
 - (a) Cytochrome oxidase
 - (b) Succinate dehydrogenase
 - (c) Dihydrolipoyl dehydrogenase
 - (d) All of these
 - (vii) From the biological viewpoint, solutions can be grouped into :
 - (a) Isotonic solution
 - (b) Hypotonic solutions
 - (c) Hypertonic solution
 - (d) All of these
 - (viii) Enzymes catalysing electron transport are present mainly in the :
 - (a) Ribosomes
 - (b) Endoplasmic reticulum
 - (c) Lysosomes
 - (d) Inner mitochondrial membrane
2. Give an account of C4 cycle of CO₂ fixation in Photosynthesis.
3. Give an account of Oxidative phosphorylation.
4. Describe the process of absorption of water in land plants.
5. Give an account of Nitrogen cycle.
6. give an account of Photoperiodism in plants.
7. Describe the process of translocation of solutes in plants.
8. What is vernalization ? Mention with reference to plants.
9. Write short notes on any two of the following :
 - (a) Electron transport chain
 - (b) Osmosis
 - (c) carbon cycle
 - (d) Structure and function of Mitochondria
10. Describe the role of Gibberellins in the physiology of plants.



Nalanda Open University
Annual Examination - 2020
B.Sc. Botany (Honours), Part-III
Paper-VI (Environmental Biology)

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. Questions No. 1 is compulsory. All questions carry equal marks.

1. Multiple choice questions:
 - (i) The natural place of an organism or community is known as
(a) Niche (b) Biome (c) Habitat (d) Habit
 - (ii) Plants growing under direct sunlight are known as :
(a) Heliophytes (b) Sciophytes (c) Psamophytes (d) Dicots
 - (iii) An orchid living on a tree exhibit
(a) Predator (b) Mutaalism (c) Commensalism (d) Parasitic
 - (iv) Which statement is correct with respect to the food chain?
(a) Every component of food chain forms trophic level.
(b) Inter-relation between different food chains is known as a food web.
(c) All the chains formed by nutritional relations is used to understand energy flow.
(d) All of above.
 - (v) Which of the following requires maximum energy?
(a) Secondary consumer (b) Decomposer
(c) Primary consumer (d) Primary producer
 - (vi) The bottom are where production is less than respiration in a pond ecosystem is termed as
(a) Profundal zone (b) Tidal zone
(c) Benthic zone (d) Limnetic zone
 - (vii) Which is not the characteristic of a population?
(a) Nataliy (b) Mortality (c) Stratification (d) Sex ratio
 - (viii) All species of Lemur are endemic to which area?
(a) Madagascar (b) Seychelles Island (c) Galapagos Island (d) New Caledonia
2. What is succession? Mention different stages of succession on bare rock.
3. What is Bio-geochemical cycle? Describe any one of them in detail.
4. What do you mean by biological diversity? Describe with suitable example.
5. Describe different sources of air pollution. What measures can be taken to control it?
6. Describe different Phyto-geographical regions of India.
7. What are the values of Biodiversity? Describe.
8. Describe different categories of natural resources.
9. What measures can be taken for conservation of Biological diversity?
10. Write short notes on any **two** of the following:
 - (a) Halophytes (b) Xerophytic adaptation. (c) Pond ecosystem (d) Eutrophication



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Paper-VIII (Genetics)

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. Questions No. 1 is compulsory. All questions carry equal marks.

1. Multiple choice questions:
 - (i) The association of histone H1 with a nucleosome indicates :
(a) DNA replication is occurring (b) The DNA is condensed into a Chromatin Fibre.
(c) The DNA double helix is exposed (d) Transcription is occurring
 - (ii) DNA-dependent RNA polymerase catalyzes transcription on the strand of the DNA which is called the:
(a) Sense strand (b) Template strand (c) Coding strand (d) Alpha strand
 - (iii) The chromosomal theory of heredity implies that :
(a) Chromosomes are composed of DNA and protein
(b) Genes are composed of chromosomes
(c) organism cannot live without chromosomes
(d) Genes are located on the chromosomes and are transmitted to the next generation through them.
 - (iv) The tendency of offspring to differ from parents is called :
(a) Variation (b) Heredity (c) Inheritance (d) Resemblance
 - (v) The alternate forms of a gene is called :
(a) Recessive character (b) Dominant character
(c) Alleles (d) Alternate gene
 - (vi) Which of the following separates the strands of DNA during replication ?
(a) Gyrase (b) Topoisomerase (c) Helicase (d) DNA polymerase
 - (vii) In Prokaryotes, RNA polymerase catalyses the synthesis of :
(a) mRNA (b) rRNA (c) tRNA (d) All of the above
 - (viii) Restriction Enzymes are found in :
(a) Virus (b) Nematodes (c) Bacteria (d) Fungi
2. Define Mutation and discuss its role in crop improvement.
3. Give an account of PCR methodology for DNA amplification.
4. Define interaction of Gene. Give one example to prove.
5. Explain genetic counseling and describe its significance and role in human life.
6. Describe the role of Vectors and its type used in Recombinant DNA technology (Genetic Engineering)
7. Write short notes on any two of the following :
(a) Turners Syndrome (b) Wobble hypothesis
(c) Endonuclease (d) Messenger RNA
8. Explain Genetic code and describe the characteristics of Genetic code.
9. Describe the meaning of Conservation of Germ plasm. Explain briefly *in situ* and *ex situ* conservation.
10. Write short notes on any two of the following :
(a) Mean (b) Median (c) Mode (d) Standard error

