+3 Sem-II(NEP)
BO-C-1(P-3)

April,2025
Cell Biology (Major)
Full Marks-100/ Time-3.00 hours

Part A

Q.1 Multiple Choice Questions (compulsory) (10x1 =10)

I. Plasmodesmata in plant cells are functionally similar to:
a) Gap junctions b) Tight junctionsc) Desmosomes d) Hemidesmosomes

II. Which cytoskeletal element is made of actin?
a) Microtubules b) Microfilaments c) Intermediate filaments d) Centrioles

III. Origin of mitochondria in eukaryotic cells is explained by:
a) Darwin's theory b) Endosymbiotic theory c) Germ plasm theory d) Fluid mosaic model

IV. Plant vacuole is surrounded by:
a) Tonoplast b) Cell wall c) Plasma membrane d) Endomembrane

V. Which organelle modifies and packages proteins?
a) Nucleus b) Golgi apparatus c) Lysosome d) Mitochondria

VI. Peroxisomes are involved in:
a) Protein synthesis b) Photorespiration c) DNA replication d) Photosynthesis

VII. Semi-autonomous organelles contain:
a) Only RNA b) DNA and Ribosomes c) Lipids only d) No genetic material

VIII. Nuclear pores help in:
a) ATP production b) Exchange of materials between nucleus and cytoplasm
c) Photosynthesis d) Protein synthesis

IX. Z-DNA is:
a) Right-handed helix b) Left-handed helix c) Single-stranded d) Triple helix

X. Cytokinesis in animal cells occurs by:
a) Cell plate formation b) Cleavage furrow c) Apoptosis d) Karyokinesis

Part B

Q.2 Short Questions type maximum 50 words (compulsory) (9x2)

I. Define the cell theory.
II. Mention any one type of RNA and its function
III. Write two differences between mitosis and meiosis
IV. Different phases of cell cycle.
V. Give chemical components of biological membranes.
VI. What is fluid mosaic model?
VII. Mention one role of the nuclear lamina.
VIII. What are nucleotides?
IX. Name the four nitrogenous bases of DNA.

Part -C

Q.3 Answer any eight question maximum 250 words **(8×5)**

I. Describe the chemistry and role of the plant cell wall.
II. Explain the origin of eukaryotic cells (endosymbiotic theory).
III. Write a short note on the structure and functions of plasmodesmata.
IV. Write short notes on the semiautonomous nature of chloroplasts
V. Describe the structure and function of the plant vacuole.
VI. Describe the role of peroxisomes in plant cells
VII. What is the nuclear pore complex? Write its functions.
VIII. Explain briefly the regulation of the eukaryotic cell cycle.
IX. Write a short note on the packaging of DNA in eukaryotic chromosomes.
X. Describe the structure of A, B, and Z forms of DNA.

Part -D

Q.4 Answer any four-question maximum 800 words **(4×8)**

I. Discuss the differences between prokaryotic and eukaryotic cells with suitable diagrams. **OR**

Write an essay on the structure and roles of cytoskeletal elements (microtubules, microfilaments, intermediate filaments).

II. Explain various types of membrane transport (passive, active, facilitated diffusion, endocytosis, exocytosis).

OR

Describe the ultrastructure and roles of lysosomes in cellular digestion.

III. Describe the structure and function of mitochondria and explain their role in ATP synthesis. **OR**

Write an essay on the structure and functions of the nucleus.

IV. Describe the structure and functions of nucleolus and chromatin organization.

OR

Describe the stages of meiosis and its significance in genetic variation.

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+3 Sem-II(NEP)
BO-C-1(P-4)

April,2025

Mycology & Phytopathology (Major)

Full Marks-100/ Time-3.00 hours

Part A

Q.1 Multiple Choice Questions (compulsory) (10x1 =10)

I. True fungi are also known as:
a) Protista b) Mycota c) Algae d) Lichens

II. Zygomycota reproduce sexually by forming:
a) Basidiospores b) Ascospores c) Zygospores d) Conidia

III. Basidiomycota produce spores on:
a) Asci b) Basidia c) Sporangia d) Conidiophores

IV. Slime molds belong to:
a) Myxomycota b) Zygomycota c) Ascomycota d) Basidiomycota

V. The vegetative body of slime molds is called:
a) Mycelium b) Plasmodium c) Hyphae d) Conidia

VI. Arbuscular mycorrhiza belongs to:
a) Basidiomycota b) Glomeromycota c) Oomycota d) Zygomycota

VII. Which fungus is used in the production of citric acid?
a) Aspergillus niger b) Saccharomyces c) Rhizopus d) Agaricus

VIII. Fungi used in baking and brewing:
a) Saccharomyces cerevisiae b) Aspergillus c) Agaricus d) Rhizopus

IX. Rust and smut diseases are caused by:
a) Bacteria b) Viruses c) Fungi d) Algae

X. White rust of crucifers is caused by:
a) Albugo candida b) Puccinia c) Aspergillus d) Trichoderma

Part B

Q.2 Short Questions type maximum 50 words (compulsory) (9x2)

I. Define true fungi.

II. Write two general characteristics of Zygomycota.

III. Mention the cell wall composition of true fungi.

IV. Give one example of Oomycota.

V. What is mycorrhiza?

VI. What is heterothallism in fungi?

VII. Mention two applications of fungi in the food industry.

VIII. What is mycoprotein? Give one example.

IX. Name two bacterial diseases of plants.

X. What is a host-pathogen relationship?

Part C

Q.3 Answer any eight question maximum 250 words (8×5)

I. Write a short note on thallus organization in fungi.

II. Discuss the classification of true fungi with suitable examples.

III. Describe the life cycle of *Phytophthora*.

IV. What are lichens? Explain their structure and economic importance.

V. Discuss the ecological significance of endomycorrhiza and ectomycorrhiza.

VI. Discuss the role of fungi in the production of organic acids and enzymes.

VII. What are mycotoxins? Explain their significance with examples

VIII. Define phytopathology. Write a note on general symptoms of plant diseases.

IX. Describe the life cycle and symptoms of TMV.

X. Discuss fungal diseases of plants with reference to early blight of potato.

Part D

Q.4 Answer any four-question maximum 800 words (4×8)

I. Describe the general characteristics, thallus organization, and life cycle of *Rhizopus* (Zygomycota). **OR**

Explain in detail the life cycle of *Saccharomyces* with reference to its economic importance.

II. Describe the morphology, classification, and ecological importance of slime moulds.

OR

Discuss different types of mycorrhizal associations and their significance in plant growth.

III. Discuss secondary metabolites of fungi and their pharmaceutical applications.

OR

Explain biological control using fungi (mycofungicides, mycoherbicides, mycoinsecticides) with examples.

IV. Define phytopathology and explain the geographical distribution, etiology, and symptomatology of plant diseases.

OR

Explain the disease cycle, symptoms, and control measures of citrus canker and angular leaf spot of cotton.

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+3 Sem-II(NEP)
BO-C-3(P-1)

April,2025
Microbiology and Phycology(Minor)
Full Marks-100/ Time-3.00 hours

Part A

Q.1 Multiple Choice Questions (compulsory) (10x1=10)

I. A virus is made up of _____?
a) Protein coat and nucleic acid b) Protein coat, nucleic acid and mitochondria
c) Nucleic acid, cell wall and cell membrane d) Nucleic acid and cell membrane

II. Which of the following has a complex symmetry?
a) T4 phage b) Adenovirus c) Influenza virus d) all of the above

III. A fully formed infectious viral particles is called_____?
a) Virion b) Viroid c) Capsid d) Virusoid

IV. What is the cluster of polar flagella called?
a) Peritrichous b) Monotrichous c) Amphitrichous d) Lophotrichous

V. Which structure is analogous to mesosome of bacteria?
a) Golgi apparatus of eukaryotes b) Lysosomes of eukaryotes
c) Mitochondria of eukaryotes d) None of the above

VI. Which one of the following is a colonial alga?
a) Ulothrix b) Spirogyra c) Volvox d) Chlorella

VII. Mannitol is a reserved food found in _____?
a) Gracillaria b) Porphyra c) Chara d) Fucus

VIII. What is the shape of chloroplast in Chlamydomonas?
a) Cup shaped b) Spiral c) Stellate d) Collar shaped

IX. The famous Japanese dish sushi is made with the help of the red algae named _____?
a) Vermilion b) Porphyra c) Chondrus d) Eucheuma

X. How does Vaucheria reproduce asexually?
a) Fragmentation b) zoospores, aplanospores or hypnospores
c) Conjugation d) Budding

Part B

Q.2 Short Questions type maximum 50 words (compulsory) (9x2)

I. What are Prions?

II. Write down the role of viruses in vaccine?

III. Differentiate between archeobacteria and eubacteria?

IV. What is the role of pilus in conjugation?

V. What do you mean by heterocyst?

VI. Write the short note on different pigments in algae?

VII. Write short note on thallus structure of Chlamydomonas?

VIII. What are conceptacles?

IX. Write a note on general characteristics of Xanthophyta?

Part C

Q.3 Answer any eight question maximum 250 words (8×5)

I. Describe the structure and replication of a DNA virus studied by you?
II. Describe the structure and lytic life cycle of Bacteriophage?
III. Write a note on role of bacteria to augment agricultural production?
IV. Describe the reproduction of Nostoc?
V. Briefly explain the evolutionary significance of *Prochloron*.
VI. Explain the range of thallus organization in algae.
VII. Write a short note on the cell structure of *Coleochaete*.
VIII. Write a note on sex organs of *Chara*.
IX. Describe the asexual reproduction in *Vaucheria*.
X. Explain the morphology of *Fucus* with suitable diagrams.

Part D

Q.4 Answer any four-question maximum 800 words (4×8)

I. Discuss the microbial nutrition, growth, and metabolism in detail.

II. Discuss the Baltimore's system of classification of viruses.

III. Give an account on transduction in bacteria along with its significance.

IV. Describe different methods of reproduction found among algae.

V. Describe the general characteristics of Rhodophyta and explain the life cycle of *Polysiphonia* with suitable diagrams.

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