

Very Similar Test (VST) Sets 1–5

DINAKRUSHNA COLLEGE, JALESWAR, BALASORE, ODISHA
DEPARTMENT OF BOTANY

UG 1st SEMESTER (HONOURS) — CORE 1, PAPER – MAJOR I
(BOTANY)

Microbiology and Phycology

Full Marks: 100

Time: 3 hours

Answer all questions

Section A — Fill in the blanks, $1 \times 10 = 10$ marks

Section B — Short answer questions, $2 \times 9 = 18$ marks

Section C — Notes (answer any eight of nine), $5 \times 8 = 40$ marks

Section D — Essay-type answers (answer any four of five), $8 \times 4 = 32$ marks

DINAKRUSHNA COLLEGE, JALESWAR

VST – 1

Botany

Class – UG 1st Semester

Full Marks : 100

Paper – Core1 Major- I

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

1. Fill in the blanks:

1 × 10

- (a) The genetic material of TMV (Tobacco Mosaic Virus) is _____.
- (b) _____ are small, naked, infectious RNA molecules without a protein coat.
- (c) Reproduction by exchange of genetic material through a tube-like sex pilus in bacteria is called _____.
- (d) The resting, thick-walled spore formed by cyanobacteria under unfavourable conditions is called a/an _____.
- (e) _____ is the specialised cell in cyanobacteria responsible for nitrogen fixation.
- (f) The reserve food material in Chlorophyceae is stored mainly as _____.
- (g) In Oedogonium, the small male plant developing on the female filament is called a _____.
- (h) The cap cell is a characteristic structural feature found in _____.
- (i) _____ is the pigment mainly responsible for the red colour of Rhodophyceae.
- (j) The globule of Chara represents the _____ sex organ.

SECTION – B

2. Answer the following questions : **2 × 9**

- (a) What is a prion?
- (b) Distinguish between lytic and lysogenic cycle of a bacteriophage.
- (c) What is binary fission?
- (d) What is the economic importance of Prochloron?
- (e) What is a spheroplast?
- (f) Define isogamous reproduction.
- (g) What is the palmelloid stage in algae?
- (h) What is the function of the pyrenoid in Chlamydomonas?
- (i) Define alternation of generation.

SECTION – C

3. Write notes on any eight of the following : 5 × 8

- (a) Structure of bacteriophage
- (b) Economic importance of viruses
- (c) Morphology and life cycle of Nostoc
- (d) Transformation in bacteria
- (e) Reproduction in Volvox
- (f) Structure of Chara
- (g) Morphology of Vaucheria
- (h) Carposporophyte of Polysiphonia
- (i) Classification of algae (Fritsch system)

SECTION – D

4. Answer any four of the following : 8 × 4

- (a) Describe the structure and replication (lytic and lysogenic cycles) of bacteriophage.
- (b) Describe the cell structure, nutrition and reproduction of bacteria.
- (c) Describe the structure and life cycle of Chlamydomonas.
- (d) Give an account of the morphology and life cycle of Fucus.
- (e) Describe the structure and life cycle of Polysiphonia.

DINAKRUSHNA COLLEGE, JALESWAR

VST – 2

Botany

Class – UG 1st Semester

Full Marks : 100

Paper – Core1 Major- I

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

SECTION – A

1. Fill in the blanks:

× 10

1

- (a) The Baltimore classification of viruses is based on the nature of the _____ of the virus.
- (b) _____ disease is a well-known viral disease of tobacco plants caused by TMV.
- (c) Bacteria lacking a cell wall are called _____.
- (d) The transfer of naked DNA from the environment into a bacterial cell is called _____.
- (e) _____ algae shows a coenocytic (aseptate), siphonaceous thallus organisation.
- (f) The motile, flagellated asexual reproductive cell of algae is called a _____.
- (g) _____ is the type of sexual reproduction in which gametes are similar in size and motility.
- (h) In Fucus, the reproductive structures are borne inside a cavity called the _____.
- (i) The colony of Volvox is composed of cells arranged in a hollow _____ form.
- (j) _____ is regarded as an evolutionary link between algae and bryophytes.

SECTION – B

2. Answer the following questions:

2 × 9

- (a) What are viroids? How do they differ from viruses?
- (b) What is the significance of the Baltimore classification of viruses?
- (c) What is transduction in bacteria?
- (d) Distinguish between archaebacteria and eubacteria.
- (e) What is the evolutionary significance of Prochloron?

- (f) What is a nucleolus in Chara?
- (g) Define anisogamy.
- (h) What is the role of algae in agriculture?
- (i) What are pyrenoids?

SECTION – C

3. Write notes on any eight of the following :

5 × 8

- (a) Lytic life cycle of virus
- (b) Vaccine production using viruses
- (c) Cell structure of bacteria
- (d) Heterocyst and its function
- (e) Thallus organisation of algae
- (f) Morphology and life cycle of Oedogonium
- (g) Reproduction in Coleochaete
- (h) Morphology of Ectocarpus
- (i) Pigment system of Rhodophyceae

SECTION – D

4. Answer any four of the following :

8 × 4

- (a) Give an account of the discovery, nature and general structure of viruses.
- (b) Describe the vegetative, asexual and sexual (recombination) methods of reproduction in bacteria.
- (c) Describe the morphology and life cycle of Volvox.
- (d) Give an account of the structure and life cycle of Chara and discuss its evolutionary significance.
- (e) Describe the morphology, cell structure and reproduction in Ectocarpus.

DINAKRUSHNA COLLEGE, JALESWAR

VST – 3

Botany

Class – UG 1st Semester

Full Marks : 100

Paper – Core1 Major- I

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

1. Fill in the blanks :

1 × 10

- (a) _____ are infectious protein particles devoid of nucleic acid, responsible for diseases such as scrapie and Creutzfeldt–Jakob disease.
- (b) The DNA virus that infects bacteria and is used as a model to study the lytic cycle is the _____.
- (c) The bacterial cell wall is composed mainly of _____.
- (d) _____ is the group of bacteria adapted to extreme environments such as high salinity, temperature or acidity.
- (e) In Nostoc, the specialised cell responsible for perennation and asexual reproduction under unfavourable conditions is the _____.
- (f) The flagella found in Chlorophyceae are typically of the _____ type.
- (g) The reserve food material stored in Phaeophyceae is mainly _____.
- (h) In Chara, the female sex organ is called the _____.
- (i) _____ is the resting spore stage occurring in Vaucheria under unfavourable conditions.
- (j) The life cycle of Polysiphonia shows _____ distinct types of thalli/generations, hence it is described as triphasic.

SECTION – B

2. Answer the following questions :

2 × 9

- (a) What is the nature and general structure of a virus?
- (b) Differentiate between DNA and RNA viruses with one example each.
- (c) What is meant by conjugation in bacteria?
- (d) What are the economic uses of bacteria in industry?
- (e) Define heterocyst and mention its function.
- (f) What is meant by range of thallus organisation in algae?
- (g) What is oogamy? Give one algal example.
- (h) What is the significance of Coleochaete in evolution?

- (i) What is a receptacle in *Fucus*?

SECTION – C

3. Write notes on any eight of the following :

5 × 8

- (a) Prions
- (b) Economic importance of bacteria in agriculture
- (c) Reproduction in cyanobacteria
- (d) Classification of algae (Lee's evolutionary system)
- (e) Structure and reproduction of *Chlamydomonas*
- (f) Morphology and life cycle of *Vaucheria*
- (g) Plurilocular and unilocular sporangia
- (h) Economic importance of Rhodophyceae
- (i) Palmelloid stage in algae

SECTION – D

4. Answer any four of the following :

8 × 4

- (a) Describe the classification (Baltimore system), general structure and replication of viruses.
- (b) Give an account of the cell structure, nutrition and economic importance of bacteria.
- (c) Describe the range of thallus organisation, cell structure and methods of reproduction in algae.
- (d) Give an account of the morphology and life cycle of *Chara*.
- (e) Describe the structure and life cycle of *Fucus*.

DINAKRUSHNA COLLEGE, JALESWAR

VST – 4

Botany

Class – UG 1st Semester

Full Marks : 100

Paper – Core1 Major- I

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

SECTION – A

1. Fill in the blanks :

1 × 10

- (a) The protein coat enclosing the genetic material of a virus is called the _____.
- (b) _____ is the type of viral life cycle in which the phage genome integrates into the host chromosome and remains dormant.
- (c) Bacteria which have lost their cell wall due to enzymatic action or antibiotics, but remain intact due to a protective medium, are called _____.
- (d) _____ is the type of nutrition in which bacteria derive their carbon from organic compounds.
- (e) The general characteristics of *chlorophyll a* and *b* containing prokaryotes are seen in the group _____.
- (f) _____ is the term for the colonial arrangement of daughter colonies seen in Volvox.
- (g) In Oedogonium, cell division leaves behind characteristic ring-like structures called _____.
- (h) _____ is the type of thallus organisation seen in *Ectocarpus*.
- (i) The male gametangium in *Vaucheria* is called the _____.
- (j) _____ is the arrangement of cells surrounding the central axial cell, characteristic of the genus *Polysiphonia*.

SECTION – B

2. Answer the following questions :

2 × 9

- (a) What is a viroid? Give one example.
- (b) What is the role of viruses in medicine and diagnostics?
- (c) What is the difference between vegetative and asexual reproduction in bacteria?
- (d) What is the economic importance of *Nostoc*?
- (e) What is an akinete?
- (f) What is anisogamy? Give an algal example.
- (g) What is the reserve food material in Xanthophyceae?

- (h) Define carposporophyte.
- (i) What is the significance of the evolutionary classification of Lee?

SECTION – C

3. Write notes on any eight of the following :

5 × 8

- (a) Viral plant diseases
- (b) Genetic recombination in bacteria
- (c) Morphology and life cycle of *Nostoc*
- (d) Economic importance of algae
- (e) Structure and reproduction of *Coleochaete*
- (f) Morphology and life cycle of *Oedogonium*
- (g) Evolutionary significance of *Chara*
- (h) Reproduction in *Fucus*
- (i) Pigment system of algae

SECTION – D

4. Answer any four of the following :

8 × 4

- (a) Describe the structure of TMV and discuss the economic importance of viruses.
- (b) Give an account of the cell structure, inclusions and reproduction (vegetative, asexual, recombination) in bacteria.
- (c) Describe the morphology and life cycle of *Chlamydomonas* with the help of labelled diagrams.
- (d) Give an account of the structure and life cycle of *Vaucheria*.
- (e) Describe the morphology, cell structure and life cycle of *Polysiphonia*.

DINAKRUSHNA COLLEGE, JALESWAR

VST – 5

Botany

Class – UG 1st Semester

Full Marks : 100

Paper – Core1 Major- I

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

1. Fill in the blanks : 1 × 10

- (a) The scientist credited with early studies on Tobacco Mosaic Disease that led to the discovery of viruses was _____.
- (b) _____ is the enzyme-mediated process by which a bacteriophage transfers bacterial DNA from one cell to another.
- (c) _____ bacteria thrive in extreme environments and are considered among the most primitive life forms.
- (d) The photosynthetic pigment mainly responsible for the blue-green colour of cyanobacteria is _____.
- (e) _____ is the term for asexual, non-motile spores formed under unfavourable conditions in some algae.
- (f) The cell wall of most algae is composed mainly of _____.
- (g) _____ is the reserve food material found in Rhodophyceae.
- (h) The Xanthophyceae member with a coenocytic, tubular thallus is _____.
- (i) _____ is the sexual reproductive structure that develops into the carposporophyte in red algae.
- (j) The bacterial cell wall is digested by the enzyme _____ to form a protoplast/spheroplast.

SECTION – B

2. Answer the following questions : 2 × 9

- (a) What is the Baltimore classification of viruses based on?
- (b) What is the significance of vaccine production using viruses?
- (c) What is mycoplasma? Mention one disease caused by it.
- (d) What is the role of cyanobacteria in biotechnology?
- (e) What is a nanodiamond?
- (f) What is the function of the contractile vacuole in *Chlamydomonas*?
- (g) What is the evolutionary significance of Prochloron?

- (h) What is a conceptacle in *Fucus*?
- (i) What is meant by the triphasic life cycle, as seen in *Polysiphonia*?

SECTION – C

3. Write notes on any eight of the following : 5 × 8

- (a) Structure and classification of viruses (Baltimore system)
- (b) Lysogenic cycle of bacteriophage
- (c) Economic importance of bacteria in medicine
- (d) Cell structure of cyanobacteria
- (e) Reproduction in *Chlamydomonas*
- (f) Structure and life cycle of *Coleochaete*
- (g) Morphology of *Ectocarpus*
- (h) Economic importance of Phaeophyceae and Rhodophyceae
- (i) Evolutionary classification of algae (Lee's system)

SECTION – D

4. Answer any four of the following : 8 × 4

- (a) Discuss the discovery, classification and economic importance of viruses.
- (b) Describe the general characteristics, cell structure and economic importance of cyanobacteria, with reference to *Nostoc*.
- (c) Give an account of the range of thallus organisation and methods of reproduction in algae.
- (d) Describe the structure and life cycle of *Chara* and discuss its evolutionary significance.
- (e) Give an account of the morphology, cell structure and reproduction of *Ectocarpus* and *Fucus*.

ANSWER KEY

Section – A (Fill in the Blanks) — All Sets

VST – 1

- (a) ssRNA
- (b) Viroids
- (c) Conjugation
- (d) Akinete
- (e) Heterocyst
- (f) Starch
- (g) Dwarf male (nannandrium)
- (h) Oedogonium
- (i) Phycoerythrin
- (j) male (antheridium)

VST – 2

- (a) genome (nucleic acid)
- (b) Mosaic
- (c) Mycoplasma
- (d) Transformation
- (e) Vaucheria (Xanthophyta)
- (f) Zoospore
- (g) Isogamy
- (h) Conceptacle
- (i) spherical
- (j) Chara

VST – 3

- (a) Prions
- (b) Bacteriophage (T-phage)
- (c) Peptidoglycan (murein)
- (d) Archaeobacteria
- (e) Akinete
- (f) whiplash
- (g) Laminarin / mannitol
- (h) Nucule (Oogonium)
- (i) Oospore
- (j) three

VST – 4

- (a) Capsid
- (b) Lysogenic
- (c) Spheroplasts
- (d) Heterotrophic
- (e) Prochlorophyceae
- (f) Coenobium
- (g) Caps (cap cells)
- (h) Filamentous, branched
- (i) Antheridium
- (j) Pericentral cells

VST – 5

- (a) Ivanowski / Beijerinck
- (b) Transduction
- (c) Archaeobacteria
- (d) Phycocyanin
- (e) Aplanospores
- (f) Cellulose
- (g) Floridean starch
- (h) Vaucheria
- (i) Carpogonium
- (j) Lysozyme