5. Describe different types of trophic and nastic movements in plants. **12**

OR

Explain the following :

A) Photoperiodism. **6**

B) Water and salinity stress. **6**

6. Comment on :

A) Temperature as a ecological factor. **4**

B) Soil profile. **4**

C) Anatomical adaptation in xerophytes. **4**

OR

P) Morphological adaptation in hydrophytes. **4**

Q) Soil Biota. **4**

R) Composition of atmosphere. **4**

7. Explain :

A) Density. **4**

B) Xerosere. **4**

C) Pond ecosystem. **4**

OR

P) Frequency. **4**

Q) Energy flow model. **4**

R) Desert ecosystem. **4**

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B. Sc. (Part - III) Fifth Semester : Botany

Plant Physiology and Ecology

P. Pages : 4

Time : Three Hours Max. Marks : 80

Note : 1. There are seven questions in all.
2. Question No **1** is compulsory and carries **8** marks.
3. Question No **2** to **6** carry equal marks.
4. Draw well labelled diagrams wherever necessary.

1. A) Fill in the blanks :

i) The induction of flowering in plants by cold temperature treatment is called as ..... ½

ii) ..... is photosynthetic apparatus. ½

iii) ..... is the hormone responsible for fruit ripening. ½

iv) Percentage of nitrogen is ..... in atmosphere. ½

B) Choose correct alternative (MCQ). **2**

v) Plant hormone responsible for Abscission is :

a) Auxin b) Ethylene
c) Abscissic Acid d) Cytokinine

vi) Glycolysis takes place in :

a) Mitochondria b) Cytoplasm
c) Golgi complex d) Chloroplast.

vii) The increase in the number of individuals in a population under given environmental condition is called as :

a) Mortality b) Natality
c) Specificity d) Frequency.

viii) Presence of sunken stomata is the characteristics of :

a) Hydrophytes b) Xerophytes
c) Mesophytes d) Halophytes.

C) Answer in one sentence : **4**

i) What is anaerobic respiration ?

ii) Define photoperiodism.

iii) Define ecology.

iv) What is nitrification ?

2. Explain the followings.

A) Transpiration pull theory. **4**

B) Diffusion. **4**

C) Significance of transpiration. **4**

OR

P) Active absorbtion of water. **4**

Q) Ion exchange. **4**

R) Antitranspirant. **4**

3. Describe in detail calvin cycle. **12**

OR

Explain :

A) Glycolysis. **6**

B) Non - cyclic photophosphorylation. **6**

4. Explain the following.

A) Sources of Nitrogen. **4**

B) Phases of growth. **4**

C) Physiological role of Gibberellins. **4**

OR

P) Role of ethylene. **4**

Q) Abscission. **4**

R) Growth curve. **4**

OR

(p) Vernalization. 4

(q) Seismonastic movement. 4

(r) Day neutral plant. 4

6. Explain :—

(a) Morphological adaptions in Xerophytes. 4

(b) Light as an ecological factor. 4

(c) Process of soil formation. 4

OR

(p) Anatomical adaptions of Hydrophytes. 4

(q) Soil Profile. 4

(r) Composition of atmosphere. 4

7. Explain :—

(a) Natality. 4

(b) Food chain. 4

(c) Pond ecosystem. 4

OR

(p) Density. 4

(q) Desert Ecosystem. 4

(r) Xerosere. 4

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Fifth Semester B. Sc. (Part – III) Examination

BOTANY

(Plant Physiology And Ecology)

P. Pages : 4

Time : Three Hours] [Max. Marks : 80

Note : (1) There are **seven** questions in all.
(2) Question No. **1** is compulsory and carries **8** marks.
(3) Question No. **2** to **6** carry equal marks.
(4) Draw well labelled diagrams wherever necessary.

1. (A) Fill in the blanks :—

(i) Swelling of dry seed in water is the process of ———— . 1/2

(ii) ———— movement found in Mimosa Pudica. 1/2

(iii) Nymphea and Hydrilla shows ——— ecological adaptations. 1/2

(iv) Power house of cell is known as —. 1/2

(B) Choose correct alternative (MCQ) :—

(v) Guttation takes place through————.

(a) Stomata

(b) Hydathodes

(c) Lenticels

(d) Cuticle. 1/2

(vi) Presence of aerenchyma is the characteristic of ———— .

(a) Hydrophytes

(b) Xerophytes

(c) Mesophytes

(d) Halophytes. 1/2

(vii) Plant absorbs Ditrogen in the form of – ———— .

(a) Nitrate

(b) Nitrite

(c) Ammonia

(d) Nitrogen. 1/2

(viii) R. Q. of carbohydrate is —— .

(a) Less than one

(b) Infinity.

(c) More than one

(d) One. 1/2

(C) Answer in **one** sentence (MCQ) :—

(ix) Define Transpiration. 1

(x) What is salinity stress ? 1

(xi) What are plant growth hormones ? 1

(xii) What are the components of atmosphere ? 1

2. Explain :—

(a) Plasmolysis. 4

(b) Importance of water to plant life. 4

(c) Carrier concept. 4

OR

(p) Diffusion. 4

(q) Guttation. 4

(r) Transpiration pull theory.. 4

3. Explain :—

(a) Glycolysis. 6

(b) Photosynthetic apparatus. 6

OR

Describe in detail Calvin cycle, in photosynthesis. 12

4. Give an account on sources of Nitrogen and explain symbiotic nitrogen fixation. 12

OR

(a) Explain practical applications of Auxin. 6

(b) Phases of Growth and Growth Curve. 6

5. Explain :—

(a) Long day plants. 4

(b) Geotropic movements. 4

(c) Water stress. 4

OR

(c) Describe in detail sources and characteristics of hazardous waste. 6

(d) Describe the sources and classification of radioactive waste. 6

6. Explain in brief :—

(a) Concept of biomedical waste. 4

(b) Classification of biomedical waste. 4

(c) Handling of radioactive waste. 4

OR

(d) Composting as a method of biomedical waste treatment. 4

(e) Storage of radioactive waste. 4

(f) Incineration. 4

7. Explain in brief :—

(a) Precaution in the processes involving explosive substances. 4

(b) Definitions and concept of indoor safety. 4

(c) Precaution in the processes involving toxic substances. 4

OR

(d) Respiratory personal protective equipment. 4

(e) Care and maintenance of non–respiratory protective equipment. 4

(f) Non respiratory protective equipment for ear and face protection. 4

(x) Long day plants 4

(y) Seismonastic movements 4

(z) Water stress. 4

6. Describe the morphological and anatomical adaptations of Xerophytes. 12

OR

(a) Process of soil formation 6

(b) Climatic factors. 6

7. Explain the follwing :

(a) Natality 4

(b) Density 4

(c) Desert ecosystem. 4

OR

(x) Hydrosere 4

(y) Energy flow model 4

(z) Pond ecosystem. 4

B.Sc. Semester—V (Part – III) Examination

BOTANY

Plant Physiology and Ecology

Time—Three Hours] [Maximum Marks—80

Note :— (1) There are **SEVEN** questions in all.

(2) Question no. **1** is compulsory and carries **8** marks.

(3) Question nos. **2** to **6** carry equal marks.

(4) Draw well labelled diagrams wherever neecssary.

1. (a) Fill in the blanks :

(i) The loss of water in form of vapour through the _____ is called stomatal transpiration. ½

(ii) Light reaction of photosynthes is takes place in _____ region of chloroplast. ½

(iii) Type of respiration which takes place in presence of _____ is called aerobic respiration. ½

(iv) _____ is an example of seismonastic movement. ½

(b) Choose correct alternatives (MCQ) :

(v) Starch-sugar hypothesis is given by :

(a) Steward

(b) Stahl

(c) Sayre

(d) None of these ½

(vi) CO_2 acceptor in C_3 pathway is :

(a) Phosphoenol pyruvate

(b) Ribulose diphosphate

(c) Phosphoglyceraldehyde

(d) Oxalo acetic acid ½

(vii) F.W. Went isolated the growth hormone from *Avena* coleoptile tips :

(a) Auxin

(b) Gibberllins

(c) Cytokinins

(d) None of these ½

(viii) Temperature is :

(a) Climatic factor

(b) Biotic factor

(c) Topographic factor

(d) Edaphic factor ½

(c) Answer in **one** sentence :

(ix) Define Photophosphorylation. 1

(x) What is Anaerobic respiration ? 1

(xi) Define Photoperiodism. 1

(xii) What is mortality ? 1

2. Explain the following :

(a) Plasmolysis 4

(b) Active absorption of water 4

(c) Significance of transpiration. 4

OR

(x) Osmosis 4

(y) Guttation 4

(z) Carrier concept. 4

3. Give detailed account of Calvin cycle. 12

OR

(a) Glycolysis 6

(b) Respiratory quotient. 6

4. Explain the following :

(a) Role of nitrate reductase 4

(b) Physiological role of auxins 4

(c) Scenescence. 4

OR

(x) Mechanism of symbiotic nitrogen fixation. 4

(y) Phases of growth 4

(z) Physiological role of gibberllins. 4

5. Explain the following :

(a) Concept of florigen 4

(b) Significance of vernalization 4

(c) Phototropic movement. 4

OR

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B.Sc. Part—III (Semester—V) Examination

BOTANY

(Plant Physiology and Ecology)

Time : Three Hours] [Maximum Marks : 80

Note :—(1) There are seven questions in all.
(2) Q. **1** is compulsory and carries 8 marks.
(3) Q. **2** to **7** carry equal marks.
(4) Draw well labelled diagram wherever necessary.

1. (A) Fill in the blanks :—
(i) _____ is called as power house of cell. ½
(ii) Minute apertures present on leaf surface and involved in transpiration are ____. ½
(iii) The percentage of oxygen in atmosphere is _____. ½
(iv) The symbiotic nitrogen fixing bacterium in Leguminous plant is _____. ½

(B) Choose correct alternatives (MCQ) :—
(v) Grana is a part of following cell organelle : ½
(a) Mitochondria (b) Ribosome
(c) Chloroplast (d) Endoplasmic Reticulum

(vi) Upper most layer of soil profile is : ½
(a) 'O' horizon (b) 'A' horizon
(c) 'B' horizon (d) 'C' horizon

(vii) The green plants are playing role of _____ in an ecosystem. ½
(a) Decomposers (b) Producers
(c) Consumers (d) Reducers

(viii) R.Q. value of Carbohydrate is _____. ½
(a) Zero (b) Unity
(c) More than unity (d) Less than unity

(C) Answer in one sentence :—
(ix) Define anaerobic respiration. 1
(x) What is hydrosere ? 1
(xi) Mention types of transpiration. 1
(xii) Name any two abiotic components of ecosystem. 1

2. Explain the following :—
(a) Passive water absorption. 4
(b) Starch—sugar conversion hypothesis. 4
(c) Osmosis. 4

OR

(d) Significance of transpiration. 4
(e) Ion-exchange theory 4
(f) Plasmolysis. 4

3. Describe in detail Kreb's Cycle. 12

OR

Describe in detail HSK pathway. 12

4. Explain :—

(a) Ethylene 4

(b) Physiological Role of auxin (any two) 4

(c) Sources of Nitrogen to plants 4

OR

(d) Role of nitrate reductase 4

(e) Phases of Growth 4

(f) Senescence. 4

5. Explain :—

(a) Long day plants 4

(b) Vernalization 4

(c) Phototropic movement 4

OR

(d) Seismonastic movement 4

(e) Role of Phytochrome 4

(f) Salinity stress. 4

6. Describe in detail morphological and anatomical adaptation in Hydrophyte. 12

OR

Explain :—

(a) Light as ecological factor. 6

(b) Process of soil formation. 6

7. Explain :—

(a) Natality and Mortality. 4

(b) Desert Ecosystem. 4

(c) Single channel energy flow model 4

OR

(d) Food web 4

(e) Xerosere 4

(f) Pond ecosystem. 4

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B.Sc. Part—III Semester—V Examination

BOTANY

(Plant Physiology and Ecology)

Time : Three Hours] [Maximum Marks : 80

Note :—(1) There are **SEVEN** questions in all.

(2) Question No. 1 is compulsory and carries 8 marks.

(3) Question No. 2 to 7 carry equal marks.

(4) Draw a well labelled diagram wherever necessary.

1. (a) Fill in the blanks :—

(i) The first stable compound in C_3 cycle is _____. ½

(ii) The _____ hormone was first time extracted from fungus *Gibbrella fujikuroi*. ½

(iii) The movement that takes place in response to light is called _____ movement. ½

(iv) _____ and abiotic components are the main part of ecosystem. ½

(b) Choose correct alternative (MCQ) :—

(v) Guttation takes place through : ½

(a) Hydathode (b) Stomata

(c) Lenticel (d) Cuticle

(vi) CAM pathway was first reported in family : ½

(a) Orchidaceae (b) Cactaceae

(c) Crassulaceae (d) Verbenaceae

(vii) *Nymphaea, Trapa, Nelumbo* show ecological adaptations : ½

(a) Epiphytic (b) Mesophytic

(c) Xerophytic (d) Hydrophytic

(viii) The phenomenon of photoperiodism was discovered by : ½

(a) Brain (b) Garner and Allard

(c) Wetlensiek (d) Melvin Calvin

(c) Answer in one sentence :

(ix) Define Osmosis. 1

(x) What is repiratory quotient ? 1

(xi) Define geotropism. 1

(xii) What is Natality ? 1

2. Comment on :—

(a) Plasmolysis 4

(b) Passive absorption to water. 4

(c) Ion-Exchange Theory. 4

OR

(d) Diffusion. 4

(e) Transpiration pull theory. 4

(f) Starch sugar hypothesis. 4

3. Give detail account of cyclic and non-cyclic photophosphorylation. 12

OR

(g) Explain Glycolysis. 6

(h) Respiratory quotient. 6

4. Comment on :—

(i) Sources of nitrogen. 4

(j) Physiological role of Gibberellins. 4

(k) Growth curve. 4

OR

(l) Symbiotic nitrogen fixation. 4

(m) Physiological role of cytokinins 4

(n) Abscission. 4

5. Comment on :—

(o) Short day plants. 4

(p) Seismonastic movement. 4

(q) Salinity stress. 4

OR

(r) Role of phytochrome. 4

(s) Vernalization. 4

(t) Phototropic movement. 4

6. Comment on :—

(u) Scope of ecology. 4

(v) Composition of atmosphere. 4

(w) Morphological adaptations of Xerophytes. 4

OR

(x) Soil profile 4

(y) Climatic factor-temperature. 4

(z) Anatomical adaptations in hydrophytes. 4

7. Describe :—

(a) Hydrosere. 6

(b) Natality and Mortality. 6

OR

(c) Xerosere 6

(d) Pond ecosystem. 6

B. Sc. (Part - III) : Botany : Paper - VII

Plant Physiology

P. Pages : 3

Time : Three Hours | Max. Marks : 40

Note : 1. All questions are compulsory.
2. All question carry equal marks.
3. Draw neat and well labelled diagrams wherever necessary.

1. Comment on : **8**

a) Osmosis.

b) Carrier concept

c) Mechanism of active absorption.

d) Significance of transpiration

OR

e) Physical properties of water.

f) Plasmolysis

g) Ionic exchange theory

h) Factors affecting transpiration.

2. Comment on : 8

a) Cyclic photophosphorylation

b) Graphic sketch of HSK pathway

c) CAM - pathway

d) Significance of photorespiration

OR

e) Structure of chloroplast

f) Two-pigment system

g) Source - sink mechanism

h) Graphic sketch of photorespiration

3. Describe Kreb's cycle in plants. 8

OR

a) Pentose phosphate pathway.
b) Electron transport system in mitochondria.

4. Comment on : 8

a) Symbiotic nitrogen fixation

b) Functions of Lipids

c) Deficiency symptoms of nitrogen and sulphur.

d) Hydroponics

OR

e) Role of nitrate reductase

f) β - oxidation

g) Role of Phosphorus

h) Deficiency symptoms of copper.

5. What are plant hormones ? Explain the practical applications of Auxins. 8

OR

a) Factors causing seed dormancy.

b) Seismonastic movement.

****

5. Explain the following.

a) Role of phytochrome. 4

b) Vernalization. 4

c) Seismonesty movement. 4

OR

p) Salinity stress. 4

q) Phototropic movement. 4

r) Short day plants. 4

6. Describe morphological and anatomical adaptions of hydrophytes. 12

OR

Explain :

a) Process of soil formation. 6

b) Atmosphere and its composition. 6

7. Explain the following.

a) Mortality. 4

b) Food web. 4

c) Hydrosere. 4

OR

p) Frequency.

q) Pond ecosystem.

r) Abundance.

****

B.Sc. Part - III : Semester Fifth : Botany

Plant Physiology & Ecology

P. Pages : 4

Time : Three Hours Max. Marks : 80

Note : 1. There are seven question in all.
2. Question no. **1** is compulsory and carries 8 marks.
3. Question no. 2 to 6 carry equal marks.
4. Draw a well labelled diagrams wherever necessary.

1. a) Fill in the blanks.

i) Guttation take place through the ..... ½

ii) The enzymes required for Kreb's cycle are found in ..... part of mitochondria. ½

iii) The movement of stem towards light is known is ..... movement. ½

iv) Percentage of oxygen is ..... in atmosphere. ½

b) Choose correct alternative (MCQ)

v) The end product of Glycolysis is ½

i) Acetyl - CoA

ii) Citric acid

iii) Pyruvic acid

iv) $CO_2 + H_2O$

vi) Symbiontic nitrogen fixing bacteria in leguminoceae is..... ½
   i) Clostridium.
   ii) Rhizobium.
   iii) Azotobacter
   iv) Azospirillum.

vii) Casuarina, Nerium, Asparagus shows ecological adaptation. ½
   i) Xerophytic
   ii) Hydrophytic
   iii) Mesophytic
   iv) Epiphytic

viii) Soil is ... ½
   i) Climitic factor
   ii) Biotic factor
   iii) Edaphic factor
   iv) Abiotic factor

c) Answer in one sentence :

a) Define vernalization ? **1**

b) What are xerophytes ? **1**

c) Define short ray plants. **1**

d) What is plasmolysis ? **1**

2. Explain the following.

a) Osmosis. **4**

b) Starch sugar hypothesis. **4**

c) Guttation. **4**

OR

p) Passive absorption of water.

q) Root pressure theory.

r) Imbibition.

3. Describe in detail Kreb's cycle. **12**

OR

a) Cyclic photophos phorylation. **6**

b) Calvin cycle. **6**

4. Explain the following.

a) Symbiotic nitrogen Fixatation. **4**

b) Growth curve. **4**

c) Cytokinin. **4**

OR

p) Physiology of senescence.

q) Physiological role of abscissic acid.

r) Phases of growth.