

2017

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions selecting either {(a),(b)}
or {(c),(d)} of each question

Draw neat and labelled diagram wherever necessary

1. a) Define "fungi". Give some general characteristics of fungi and mention the range of thallus organisation. 8
- b) Write short notes on the following : 2 × 2
 - i) General Characteristics of Chytridiomycetes.
 - ii) Chlamyospore formation in *Rhizopus*.

OR

- c) Describe in detail the asexual mode of reproduction in *Penicillium*. 8
- d) Write short notes on the following : 2 × 2
 - i) Budding in *Saccharomyces*
 - ii) Apothecia of *Peziza*

2. a) What are the different hosts of *Puccinia*? Describe the continuation of life cycle of this fungus between these hosts. 8
- b) Write short notes on the following : 2+2
- i) Symptoms of loose smut
 - ii) Fairy ring.

OR

- c) Describe the life cycle of *Phytophthora infestans*. Why is it important to study this fungus? 8
- d) Write short notes on the following : 2 × 2
- i) Characteristic features of Slimemolds
 - ii) Oospore in *Albugo*.
3. a) Give the general characteristics and range of thallus organization of Lichen. 8
- b) Write short notes on the following : 2 × 2
- i) Significance of endomycorrhiza
 - ii) Soredia in Lichen.

OR

[3]

- c) Describe in detail the sexual reproduction in Lichen. 8
- d) Write short notes on the following : 2 × 2
- i) Significance of ectomycorrhiza
 - ii) Isidia in Lichen.
4. a) Highlight the application of fungi in fermentation, baking and enzyme preparation processes on industrial scale. 8
- b) Write short notes on the following : 2 × 2
- i) Fungi as biofertilizers
 - ii) Mycoherbicides.

OR

- c) Give a note on the role of fungi in biotechnology. 8
- d) Write short notes on the following : 2 × 2
- i) Pharmaceuticals from fungi
 - ii) Mycofungicides.

5. a) Define the terms 'Host', 'Pathogen' and 'Symptoms'. Give a note on the host-pathogen relationships. 8
- b) Write short notes on the following : 2 × 2
- i) Role of quarantine in plant disease control.
 - ii) Control measures for early blight of Potato.

OR

- c) Describe the symptoms, etiology and control measures of the disease Citrus Carkey. 8
- d) Write short notes on the following : 2 × 2
- i) Control measures for viral diseases in Plants with reference tobacco mosaic virus.
 - ii) Symptoms in white rust of crucifers.

2017

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions selecting either {(a),(b)}

or {(c),(d)} for each question

Give diagrams wherever necessary

1. a) Distinguish dicot stem from monocot stem with suitable anatomical diagram. 8
- b) Write short notes on the following : 2+2
- i) apical meristem
- ii) Dorsiventral leaf.

OR

- c) Describe different types of simple and complex tissues with diagram. 8
- d) Write short notes on the following : 2+2
- i) Monocot root
- ii) Monocot leaf.

2. a) Describe the process of secondary growth in dicot stem. 8
- b) Write short notes on the following : 2+2
- i) Sunken stomata
 - ii) Heart wood and sap wood.

OR

- c) Give an account of adaptations in Xerophytes and hydrophytes. 8
- d) Write short notes on the following : 2+2
- i) Spring wood and autumn wood
 - ii) Vascular cambium.
3. a) Discuss the process of double fertilization in angiospermic plants. 8
- b) Write short notes on the following : 2+2
- i) T.S. of anther
 - ii) Types of Ovule.

OR

c) Discuss the adaptations and mechanism of pollination in angiospermic plants. 8

d) Write short notes on the following : 2+2

i) Embryo-sac

ii) Structure of dicot seed.

4. a) Describe the structure and function of endosperm in angiospermic seeds. 8

b) Write short notes on the following : 2+2

i) Helobial endosperm

ii) Monocot embryo.

OR

c) Discuss the embryo-endosperm relationship in angiospermic plants. 8

d) Write short notes on the following : 2+2

i) Dicot embryo

ii) Nuclear endosperm.

5. a) Describe different types of apomixis found in angiospermic plants. 8
- b) Write short notes on the following : 2+2
- i) Cleavage polyembryony
 - ii) Significance of apomixis.

OR

- c) Describe different types of polyembryony with their practical applications. 8
- d) Write short notes on the following : 2+2
- i) Parthenogenesis
 - ii) Non-recurrent apomixis.

2019

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Draw neat labelled diagrams wherever necessary

1. a) Define fungi. Mention the general characteristics and Cell wall composition of fungi. 8
- b) Write short notes on the following : 2×2
- i) Heterothallism in *Rhizopus*.
- ii) Apothecium of *Peziza*.

OR

- c) Give an account of the life cycle of *Alternaria solani*. 8
- d) Write short notes on the following : 2×2
- i) Mode of nutrition in fungi.
- ii) Conidia of *Penicillium*.

2. a) Describe the life cycle of *Puccinia* in barberry plant. 8

b) Write short notes on the following : 2 × 2

i) Fairy ring.

ii) Oospore of *Albugo*.

OR

c) Describe the life cycle of *Phytophthora*. 8

d) Write short notes on the following : 2 × 2

i) Mushroom cultivation.

ii) General characteristics of slime molds.

3. a) Give an account of the range of thallus organisation in Lichen. 8

b) Write short notes on the following : 2 × 2

i) Endomycorrhiza.

ii) Isidia in Lichen.

OR

- c) Give an account of the reproduction of mycobiont of lichen thallus. 8
- d) Write short notes on the following : 2 × 2
- i) V.S. of Apothecium of Lichen (labelled diagram only)
- ii) Role of phycobiont in lichen thallus.
4. a) Describe the application of fungi in food industry. 8
- b) Write short notes on the following : 2 × 2
- i) Fungi used as biofertilizers.
- ii) Mycofungicides.

OR

- c) Describe the application of fungi in pharmaceutical industry. 8
- d) Write short notes on the following : 2 × 2
- i) Mycoproteins.
- ii) Mycoinsecticides.

5. a) Give an account of the geographical distribution of plant diseases. 8
- b) Write short notes on the following : 2 × 2
- i) Causal organism and general symptoms of early blight of potato.
 - ii) Control measures of tobacco mosaic disease.

OR

- c) Describe the causal organism, disease cycle and control measures of white rust of crucifer. 8
- d) Write short notes on the following : 2 × 2
- i) Symptoms of angular leaf spot disease of cotton.
 - ii) Control measures of black stem rust of wheat.

2019

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Give labelled diagrams wherever necessary

1. a) Plants of which classes are included under Archegoniata ? Describe the unifying features of these classes. 8
- b) Write short notes on the following : 2 × 2
 - i) Transformation from poikilohydry to Homoiohydry.
 - ii) Diplobiontic life cycle.

OR

- c) What are the challenges the plants faced when they migrated from aquatic to land surface ? What adaptive strategies were evolved in plants to survive on land ? 8

d) Write short notes on the following : 2×2

i) Heterospory in Archegoniates.

ii) Haplobiontic life cycle.

2. a) Give an account of the range of thallus organization in bryophytes. 8

b) Write short notes on the following : 2×2

i) Archegonium in *Anthoceros*

ii) Economic importance of *Sphagnum*.

OR

c) Describe the reproduction and evolutionary trends of *Marchantia*. 8

d) Write short notes on the following : 2×2

i) Classification of Bryophytes.

ii) Thallus of *Porella*.

3. a) Describe the morphology and reproduction of *Marsilea*. 8
- b) Write short notes on the following : 2 × 2
- i) Telome theory.
 - ii) Economic importance of *Pteridophytes*.

OR

- c) Give an account of the general characteristics and classification of *Pteridophytes*. 8
- d) Write short notes on the following : 2 × 2
- i) Apogamy
 - ii) Morphology and Anatomy (L.S.) of *Equisetum* cone (Diagrams only).
4. a) Describe the process of reproduction in *cycas*. 8
- b) Write short notes on the following : 2 × 2
- i) *Pinus* needle.
 - ii) Advanced character of *Gnetum*.

OR

[4]

- c) Give an account of economic importance of gymnosperms. 8
- d) Write short notes on the following : 2 × 2
- i) Microsporangiate strobilus of *Ginkgo*.
 - ii) The female strobilus of *Gnetum*.
5. a) Define fossil. Why are fossils important ? What are the conditions required for fossilization ? 8
- b) Write short notes on the following : 2 × 2
- i) Morphology and Anatomy of *Rhynia*.
 - ii) Affinities of *Lepidodendron*.

OR

- c) Describe the morphology, anatomy and affinities of *Lyginopteris*. 8
- d) Write short notes on the following : 2 × 2
- i) The Paleozoic era.
 - ii) Stem anatomy of *Calamites*.

2019

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Give labelled diagrams wherever necessary

1. a) Define tissue. Describe the various types of simple tissues with suitable diagrams. 8
- b) Write short notes on the following : 2 × 2
- i) Anatomy of dicot root (diagram only)
 - ii) Anatomy of monocot leaf.

OR

- c) Distinguish the dicot stem from the monocot stem with suitable diagrams. 8
- d) Write short notes on the following : 2 × 2
- i) Vessels.
 - ii) Apical meristem.

2. a) Describe the secondary growth in dicot root giving neat and labelled diagram. 8
- b) Write short notes on the following : 2 × 2
- i) Cuticle
 - ii) Types of stomata.

OR

- c) Describe the various adaptations found in Xerophytes. 8
- d) Write short notes on the following : 2 × 2
- i) Sap wood
 - ii) Vascular Cambium.
3. a) Describe the structures of different types of ovules with diagram. 8
- b) Write short notes on the following : 2 × 2
- i) Seed dispersal mechanisms
 - ii) Structure of monocot seed.

OR

[3]

- c) Define pollination. Describe the mechanism of pollination in angiosperms. 8
- d) Write short notes on the following : 2 × 2
- i) Ultrastructure of mature embryo sac.
 - ii) Structure of Ovule in Angiosperm.
4. a) Describe the development of a typical monocot embryo. 8
- b) Write short notes on the following : 2 × 2
- i) Helobial endosperm.
 - ii) Types of embryos in dicots.

OR

- c) Describe the process of formation of nuclear type of endosperm. How does it differ from cellular type. 8

[4]

d) Write short notes on the following : 2×2

- i) Embryo-endosperm relationship.
- ii) Asterad type of embryo development.

5. a) Define polyembryony. What are the causes of polyembryony ? Give a short note about false polyembryony. 8

b) Write short notes on the following : 2×2

- i) Significance of Apomixis.
- ii) Recurrent apomixis.

OR

c) What do you mean by apomixis ? Describe the types and causes of apomixis with its practical applications. 8

d) Write short notes on the following : 2×2

- i) True Polyembryony
- ii) Twins and Triplets.

2022

Full Marks - 80

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Part-I

1. Fill in the blanks :

1 × 12

ଶୂନ୍ୟସ୍ଥାନ ପୂରଣ କର :

a) _____ gas is present in the air in maximum amount

ବାୟୁ ମଣ୍ଡଳରେ _____ ଗ୍ୟାସ ସର୍ବାଧିକ ମାତ୍ରାରେ ରହିଛି ।

b) The ozone layer is present in _____

ଓଜନ ସ୍ତର _____ ରେ ଉପସ୍ଥିତ ଅଛି ।

c) The World Environment Day is celebrated on _____.

ବିଶ୍ୱ ପରିବେଶ ଦିବସ _____ ତାରିଖ ଦିନ ପାଳନ କରାଯାଏ ।

d) CNG stands for _____

CNGର ପୂରାନାମ _____ ।

- e) The first trophic level in the food chain is occupied by _____
 ଖାଦ୍ୟ ଶୃଙ୍ଖଳର ପ୍ରଥମ ସ୍ତର _____ ମାନଙ୍କ ଦ୍ୱାରା ଅଧିକୃତ ।
- f) The species restricted to present in one region are called _____
 ଗୋଟିଏ ନିର୍ଦ୍ଦିଷ୍ଟ ଅଞ୍ଚଳ ମଧ୍ୟରେ ସୀମିତ ପ୍ରଜାତିକୁ _____ କୁହାଯାଏ ।
- g) The collection of rain water and stored for later use is known as _____
 ବର୍ଷାଜଳ ସଂଗ୍ରହ କରି ପରବର୍ତ୍ତୀ ସମୟରେ ବ୍ୟବହାର ପାଇଁ କରାଯାଉଥିବା ସଞ୍ଚୟକୁ _____ କୁହାଯାଏ ।
- h) Nitrogen fixation can be done by _____ Bacteria.
 ଯବକ୍ଷାରଯାନ ବିବଂଧନ _____ ବ୍ୟାକ୍ଟେରିଆ ଦ୍ୱାରା ହୋଇଥାଏ ।
- i) _____ gas causes 'Green House Effect'.
 _____ ଗ୍ୟାସ୍ ସବୁଜ ଗୃହର ପ୍ରଭାବ ପକାଇଥାଏ ।
- j) Rio Summit is associated with _____
 ରିଓ ବୈଠକ _____ ସମସ୍ୟା ସହ ସଂଶ୍ଳିଷ୍ଟ ।
- k) Acid rain is a result of excess amount of _____ gases.
 ଅମ୍ଳବୃଷ୍ଟି _____ ଗ୍ୟାସର ମାତ୍ରାଧିକତା ହେତୁ ହୋଇଥାଏ ।
- l) _____ causes depletion of ozone layer.
 _____ ଓଜନ ସ୍ତର ହ୍ରାସର କାରଣ ।

Part-II

2. Answer any **eight** of the following within two to three sentences **each** : 2 × 8

ନିମ୍ନୋକ୍ତ ଯେ କୌଣସି ଆଠଟିର ଉତ୍ତର ପ୍ରତ୍ୟେକ ଦୁଇରୁ ତିନୋଟି ବାକ୍ୟ ମଧ୍ୟରେ ପ୍ରଦାନ କର :

- a) What is communicable disease ?
ସଂକ୍ରାମକ ରୋଗ କହିଲେ କ'ଣ ବୁଝ ?
- b) What do you mean by radiation pollution ?
ବିକିରଣ ପ୍ରଦୂଷଣ କହିଲେ କ'ଣ ବୁଝ ?
- c) What are the functions of State Pollution Control Board ?
ରାଜ୍ୟ ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ମଣ୍ଡଳର କାର୍ଯ୍ୟ କ'ଣ ?
- d) What is the importance of Disaster Management ?
ବିପର୍ଯ୍ୟୟ ପରିଚାଳନାର ଗୁରୁତ୍ୱ କ'ଣ ?
- e) What is the objective of Environment Protection Act, 1986 ?
ପରିବେଶ ସୁରକ୍ଷା ଆଇନ, ୧୯୮୬ର ଅଭିପ୍ରାୟ କ'ଣ ?
- f) Explain various effects of Soil Pollution.
ମୃତ୍ତିକା ପ୍ରଦୂଷଣର ବିବିଧ ପ୍ରଭାବ ଗୁଡ଼ିକୁ ବ୍ୟାଖ୍ୟା କର ।

- g) Difference between community and population.
ଗୋଷ୍ଠୀ ଓ ଜନସଂଖ୍ୟା ମଧ୍ୟରେ ପ୍ରଭେଦ ଦର୍ଶାଅ ।
- h) Explain the effects of urbanisation on society.
ସମାଜରେ ସହରୀକରଣର ପ୍ରଭାବ ବ୍ୟାଖ୍ୟା କର ।
- i) What is Chipko Movement ?
ଚିପ୍କୋ ଆନ୍ଦୋଳନ କ'ଣ ?
- j) What is Natural Disaster ?
ପ୍ରକୃତିକ ବିପର୍ଯ୍ୟୟ କ'ଣ ?

Part-III

3. Answer any *eight* of the following within 75 words each : 3 × 8
ନିମ୍ନୋକ୍ତ ଯେ କୌଣସି ଆଠଟିର ଉତ୍ତର ପ୍ରତ୍ୟେକ ୭୫ ଶବ୍ଦ ମଧ୍ୟରେ ପ୍ରଦାନ କର :

- a) What do you mean by Atmosphere ?
ବାୟୁ ମଣ୍ଡଳ କହିଲେ କ'ଣ ବୁଝ ?
- b) Difference between communicable and not-communicable diseases.
ସଂକ୍ରାମକ ଓ ଅସଂକ୍ରାମକ ରୋଗ ମଧ୍ୟରେ ପ୍ରଭେଦ ଦର୍ଶାଅ ।

c) List various birth control methods in human being.

ଜନ୍ମ ନିୟନ୍ତ୍ରଣର ବିବିଧ ପଦ୍ଧତିଗୁଡ଼ିକୁ ଉଲ୍ଲେଖ କର ।

d) What are the features of Lithosphere ?

ଭୂମଣ୍ଡଳ ବା ଅଶ୍ୱମଣ୍ଡଳର ଗଠନ ଲେଖ ।

e) Write a short note on Air Act 1981.

ବାୟୁ ଆଇନ, ୧୯୮୧ ଉପରେ ଏକ ସଂକ୍ଷିପ୍ତ ଚିତ୍ରଣା ଲେଖ ।

f) Explain various methods for the Conservation of Natural Resources.

ପ୍ରାକୃତିକ ସମ୍ପଦର ସଂରକ୍ଷଣ ପଦ୍ଧତି ଗୁଡ଼ିକୁ ବୁଝାଅ ।

g) Explain why management of Natural Disasters are important ?

ପ୍ରାକୃତିକ ବିପର୍ଯ୍ୟୟର ପରିଚାଳନା ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ କାହିଁକି ?

h) Write a short note on Central Pollution Control Board.

କେନ୍ଦ୍ରୀୟ ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡ଼ ଉପରେ ଏକ ସଂକ୍ଷିପ୍ତ ଚିତ୍ରଣା ପ୍ରଦାନ କର ।

i) What are the various causes of Water Pollution ?

ଜଳ ପ୍ରଦୂଷଣର ବିବିଧ କାରଣାବଳୀ ଦର୍ଶାଅ ।

j) What is carbon cycle ?

କାର୍ବନ ଚକ୍ର କ'ଣ ?

Part-IV

Answer the following within 500 words each

ନିମ୍ନୋକ୍ତ ଗୁଡ଼ିକର ଉତ୍ତର ପ୍ରତ୍ୟେକ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ ପ୍ରଦାନ କର

4. a) What is Bio-geochemical cycle ? Explain its importance in ecosystems.

7

ଜୈବ-ଭୌତିକ-ରାସାୟନିକ ଚକ୍ର କ'ଣ ? ପରିସଂସ୍ଥାରେ ଏହାର ଗୁରୁତ୍ୱ କ'ଣ ?

OR

b) Give an account of different sources and effects of Air Pollution.

ବାୟୁ ପ୍ରଦୂଷଣର ବିବିଧ ଉତ୍ସ/କାରଣ ଓ ଫଳାଫଳ ଆଲୋଚନା କର ।

5. a) Discuss various control methods of population. 7

ଜନସଂଖ୍ୟା ନିୟନ୍ତ୍ରଣର ବିବିଧ ପଦ୍ଧତି ଗୁଡ଼ିକ ଆଲୋଚନା କର ।

OR

- b) Explain the causes and effects of communicable diseases with examples.

ସଂକ୍ରାମକ ରୋଗର କାରଣ ଓ ଫଳାଫଳ ଗୁଡ଼ିକୁ ସୋଦାହରଣ ଆଲୋଚନା କର ।

6. a) Write in brief about the Environmental Movements in India. 7

ଭାରତରେ ଘଟିତ ପରିବେଶ ଆନ୍ଦୋଳନ ଗୁଡ଼ିକ ସଂପର୍କରେ ସଂକ୍ଷେପରେ ଆଲୋଚନା କର ।

OR

- b) Give an account of the objectives and functions of State and Central Pollution Control Board.

ରାଜ୍ୟ ଓ କେନ୍ଦ୍ର ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡର ଅଭିପ୍ରାୟ ଓ ପ୍ରକାର୍ଯ୍ୟ ବର୍ଣ୍ଣନା କର ।

2022

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Part-I

1. Answer the following : 1 × 8

- a) Loss of water in the form of liquid from the aerial parts of the plants is known as _____.
- b) Transport of ions across cell membrane is a _____ process.
- c) _____ is an example of C₄ plant.
- d) End product of glycolysis is _____.
- e) All enzymes are chemically _____.
- f) Enzyme _____ helps in nitrogen fixation.
- g) ABA is considered as a growth _____.
- h) Hormone _____ helps in flowering of plants.

Part-II

2. Write short notes any *eight* of the following : $1\frac{1}{2} \times 8$

- a) Cuticular transpiration.
- b) Criteria of essentiality of elements.
- c) Composition of phloem sap.
- d) Role of the pigment Carotene.
- e) What do you mean by anaerobic respiration ?
- f) Write down three important properties of enzymes.
- g) Describe the process of Nitrate assimilation.
- h) What do you mean by growth regulators ?
- i) Physiological roles of ethylene.
- j) What do you mean by vernalization ?

Part-III

3. Write notes on any *eight* of the following : 2×8

- a) Water potential
- b) Passive trans-~~port~~ of ions

[3]

- c) Root pressure
- d) CAM pathway of Carbon fixation
- e) Oxidative decarboxylation of pyruvic acid to acetyl Co ~ A.
- f) Explain the process of C₄ cycle.
- g) What do you mean by enzyme inhibition.
- h) Process of ammonia assimilation in plants.
- i) Write down the physiological roles of Gibberellins.
- j) Describe the discovery and chemical structure of phytochrome.

Part-IV

4. a) Describe the mechanism of stomatal transpiration.

6

OR

- b) Describe the mechanism of translocation of organic solutes in phloem.

[4]

5. a) Explain the steps of C_3 pathway of carbon fixation. 6

OR

- b) Describe in details regarding the process of glycolysis.

6. a) What do you mean by enzymes ? Describe the mechanism of enzyme catalysis. 6

OR

- b) Explain the process of biological nitrogen fixation.

7. a) Describe the discovery and physiological role of auxin. 6

OR

- b) What do you mean by photoperiodism ? Explain the role of phytochrome in photoperiodism.

2022

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Part-I

1. Answer the following by fill in the blanks or one word answer : 1 × 8

- a) The wall of fungal hypha is composed of _____.
- b) Rust of wheat is caused by _____.
- c) White rust of crucifers is caused by _____.
- d) Fruiting body of ascolichen is called as _____.
- e) Soya sauce is commercially produced by the help of fungus _____.
- f) _____ fungal species is mostly used as mycoherbicides.
- g) Etiology means what ?
- h) Early blight of Potato is caused by _____ ?

Part-II

2. Write short notes on any *eight* of the following : 1½ × 8

- a) Types of fungal nutrition with examples
- b) Important characters of Ascomycota
- c) Write down the types of Mycorrhiza
- d) General characters of Oomycota
- e) What are the important industrial applications of fungi
- f) Uses of VAM
- g) Name the commercially available mycoinsecticides
- h) Host-parasite relationship
- i) Symptoms of citrus canker.
- j) Controlling measures of early blight of Potato.

Part-III

3. Write short notes on any *eight* of the following : 2 × 8

- a) Composition of fungal cell wall
- b) Heterokaryosis
- c) Plasmodia of slime moulds
- d) Economic importance of Lichen
- e) Role of fungi in biotechnology
- f) Application of fungi in food industry
- g) Fungi as biofertilizer
- h) Difference between loose smut and covered smut
- i) Role of quarantine
- j) Mean by symptomology.

Part-IV

4. a) Describe the life cycle of *Aspergillus*. 6

OR

b) Describe the life cycle of *Puccinia*.

[4]

5. a) Describe the life cycle of Albugo. 6

OR

b) Give a note on Mycorrhizal association, and their significance.

6. a) Give a note on application of fungi in agriculture. 6

OR

b) Describe the techniques of Mushroom cultivation.

7. a) Give a note on symptoms and controlling measures of different fungal diseases. 6

OR

b) Explain the symptoms disease cycle and control of viral disease i.e Tobacco Mosaic.

2022

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Part-I

1. Fill in the blanks : 1 × 8
- a) The basal swollen portion of the archegonium is _____.
 - b) Marchantia belongs to class _____.
 - c) The leaves which bear the sporangia are called _____.
 - d) The protostele in which Xylem core is star shaped is called _____.
 - e) Coralloid roots are found in _____?
 - f) _____ is absent in the Xylem of gymnosperms.
 - g) The study of fossils is known as _____.
 - h) The pollen bearing organs of Lyginopteris belong to _____.

Part-II

2. Answer any *eight* of the following : $1\frac{1}{2} \times 8$
- a) Write three adaptations to land habit.
 - b) Morphological structure of Funaria.
 - c) What do you mean by heterospory ?
 - d) What is protostele ?
 - e) What is apospory ?
 - f) Megasporophyll of cycas.
 - g) Angiospermic characters of Gnetum.
 - h) Affinities of Rhynia.
 - i) Morphological features of Cycadeoidea.
 - j) What do you mean by Geological-time-scale ?

Part-III

3. Write short notes on any *eight* of the following : 2×8
- a) Write down the unifying features of archegoniates.

[3]

- b) Archegoniophore of Funaria.
- c) Anatomical features of Psilotum Rhizome.
- d) Telome theory
- e) What do you mean by apogamy ?
- f) Anatomical features of coralloid root
- g) Megasporophyll of Pinus
- h) Affinities of Gnetum
- i) Anatomical features of Rhynia
- j) Morphological features of lepidodendron.

Part-IV

4. a) Describe the types of alternation of generation found in archegoniates. 6

OR

- b) Describe the range of thallus organisation in Bryophytes.

5. a) What do you mean by heterospory ? How it leads in to seed habit ? 6

OR

[4]

- b) Describe the process of steter evolution found in Pteridophytes.
6. a) Describe the sporophytic generation of Pinus. 6

OR

- b) Describe the gametophytic phase of generation found in Gnetum.
7. a) What do you mean by fossils ? Describe various process of fossilization. 6

OR

- b) Describe the reproductive features of lyginopteris.

2017

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions selecting either {(a),(b)}
or {(c),(d)} of each question

Give labelled diagrams wherever necessary

1. a) Describe the unifying features of archegoniates. 8
- b) Write short notes on the following : 2+2
- i) Sporophytic generation
- ii) Gametophyte.

OR

- c) Write on transition to land habit of archegoniates. 8
- d) Write short notes on the following : 2+2
- i) Alternation of generation
- ii) Archegonia.

[2]

2. a) Discuss reproduction and evolutionary trends in *Riccia*. 8
- b) Write short notes on the following : 2+2
- i) Antheridiophore
 - ii) Archegoniophore.

OR

- c) Discuss ecological and economic importance of Bryophytes with special reference to *Sphagnum*. 8
- d) Write short notes on the following : 2+2
- i) Classification of Bryophytes
 - ii) Capsule of *Funaria*.
3. a) Describe the stelar evolution in Pteridophytes. 8
- b) Write short notes on the following : 2+2
- i) Telome theory
 - ii) Sporocarp of *Marsilea*.

OR

- c) Discuss heterospory and seed habit in Pteridophytes. 8
- d) Write short notes on the following : 2+2
- i) Economic importance of Pteridophytes
 - ii) Prothallus of *Psilotum*.
4. a) Discuss the process of reproduction in *Cycas*. 8
- b) Write short notes on the following : 2+2
- i) Economic importance of gymnosperms
 - ii) Female cone of *Pinus*.

OR

- c) Discuss the process of reproduction in *Ginkgo*. 8
- d) Write short notes on the following : 2+2
- i) Angiospermic characters of *Gnetum*.
 - ii) T.S. of *Pinus* needle.

5. a) Discuss the morphology, anatomy and affinities of *Rhynia*. 8
- b) Write short notes on the following : 2+2
- i) Carboniferous period
 - ii) Petrification.

OR

- c) Discuss the morphology, anatomy and affinities of *Cycadeoidea*. 8
- d) Write short notes on the following : 2+2
- i) Compression fossils
 - ii) *Lyginopteris* stem.