UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 2nd Semester Examination, 2022

GE1-P2-BOTANY

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.

The question paper contains Paper-GE-1, Paper-GE-2, Paper-GE-3, Paper-GE-4, Paper-GE-5 and Paper-GE-6. Candidates are required to answer any *one* from the *six* papers and they should mention it clearly on the Answer Book.

PAPER-GE-1

BIODIVERSITY

MICROBES, ALGAE, FUNGI AND ARCHEGONIATES

GROUP-A

1.   Answer any *five* questions from the following: 1×5 = 5

   (a) Name one economically important bacteria.

   (b) What is ectomycorrhiza?

   (c) Name one aquatic bryophyte.

   (d) What is coralloid root?

   (e) What is shower of sulfur?

   (f) What are elaters?

   (g) Name one Indian species of *Oedogonium*.

   (h) What is lytic cycle?

GROUP-B

2.   Answer any *three* questions from the following: 5×3 = 15

   (a) Write down the economic importance of *Pinus*.   5

   (b) With suitable diagram, describe the internal structure of the thallus of *Marchantia*.   5

   (c) Write the economic importance of fungi. Give examples of two poisonous fungi.   3+2 = 5

   (d) "Bryophytes are amphibians of plant kingdom". Justify this statement.

   (e) Describe briefly the lysogenic cycle of virus.   5

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20

(a) Describe the cell wall structure of bacteria. Write down the economic importance of bacteria. 7+3 = 10

(b) Describe the life cycle of the nannandrous form of *Oedogonium*. 10

(c) What is stele? Describe with suitable sketches, the stelar evolution in pteridophytes. 2+8 = 10

(d) What is alternation of generation? Compare the sporophytes of *Marchantia* and *Funaria*. 2+4+4 = 10

PAPER-GE-2
PLANT ECOLOGY AND TAXONOMY
GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5

(a) What is binomial nomenclature?

(b) State the Shelford law of tolerance.

(c) What is ecesis?

(d) Give the full form of ICN.

(e) Name one important herbarium of India.

(f) What is pappus?

(g) Give one example of phylogenetic system of classification.

(h) What is endemism?

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15

(a) What is author citation? Discuss the various types of author citation. 1+4 = 5

(b) What is ecological pyramid? Write the different types of ecological pyramid. 1+4 = 5

(c) Write the roles of botanical garden? 5

(d) What is herbarium? Write down the function of herbarium. 1+4 = 5

(e) Write down the floral characteristics of Solanaceae. Give examples of two economically important plants of this family. 3+2 = 5

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20

(a) Write down the adaptive features of xerophytes and hydrophytes. 5+5 = 10

(b) What is ecotone? Write down the plant succession in a hydrosere. 2+8 = 10

(c) What is natural system of classification? Discuss the outline of the Bentham and Hooker's system of classification. Write down the merits of this classification system.   2+6+2 =10

(d) What is typification? Discuss the different types of nomenclatural types.   2+8 = 10

PAPER-GE-3

PLANT ANATOMY AND EMBRYOLOGY

GROUP-A

1.   Answer any *five* questions from the following: 1×5 = 5

   (a) What is the function of protoderm?

   (b) What is the main function of aerenchyma tissue?

   (c) What are sclereids?

   (d) What is meant by endarch xylem?

   (e) What is sunken stomata?

   (f) What is pollinia?

   (g) What is the role of tapetum in anther?

   (h) What is meant by lysigenous cavity?

GROUP-B

2.   Answer any *three* questions from the following: 5×3 = 15

   (a) Describe in detail the different types of epidermal outgrowths in plant.   5

   (b) What are the components of xylem? Describe briefly with suitable diagrams.   1+2+2 = 5

   (c) Differentiate dicot stem with monocot stem.   5

   (d) Describe the mode of development of typical dicotyledonous embryo.   5

   (e) Write a short notes on: $2\frac{1}{2}+2\frac{1}{2}=5$

     (i) Polyembryony

     (ii) Periderm.

GROUP-C

3.   Answer any *two* questions from the following: 10×2 = 20

   (a) Differentiate between root apical meristem and shoot apical meristem. Explain the different theories on shoot apical meristem.   4+6 = 10

   (b) What are tyloses? What is interfascicular cambium? Describe the secondary growth in dicot stem with labelled diagram.   2+2+6 =10

   (c) What are xerophytes? Describe the various anatomical adaptation in the xerophytes.   2+8 = 10

   (d) What is cleistogamy? Describe the contrivances for cross pollination. Write down the advantages of cross-pollination.   2+6+2 =10

PAPER-GE-4

PLANT PHYSIOLOGY AND METABOLISM

GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5

    (a) Write the full form of RuBisCO.

    (b) What is solute potential?

    (c) What is meant by apical dominance?

    (d) Name one naturally occurring auxin.

    (e) What is substrate level phosphorylation?

    (f) What is Krantz anatomy?

    (g) What does Km signify?

    (h) Name the terminal electron acceptor in oxidative phosphorylation.

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15

    (a) What is photoperiodism? What is critical day length? Give an example of Short Day Plant and Long Day Plant. 1+2+1+1=5

    (b) What is transpiration? How is it different from guttation? 1+4 = 5

    (c) What is macronutrients? Write the roles of essential elements. 1+4 = 5

    (d) Write short notes on: $2\frac{1}{2}+2\frac{1}{2}=5$

    (i) Biological nitrogen fixation

    (ii) Properties of enzymes.

    (e) Give a brief outline of classification of enzymes with suitable examples. 5

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20

    (a) How does aerobic respiration differ from fermentation? Describe the biochemical steps of EMP pathway of glycolysis. 2+8 = 10

    (b) What are major components of phloem sap? Describe pressure flow hypothesis explaining movement of sap through phloem. Discuss the mechanism of phloem loading. 2+5+3 = 10

    (c) What is photophosphorylation? Describe the Calvin cycle in detail with appropriate flowchart. 2+8 = 10

    (d) Write short notes on: 5+5 = 10

    (i) Physiological role of auxin

    (ii) Cytochrome pump hypothesis.

PAPER-GE-5

ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY

GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5

   (a) Write down the scientific name of black pepper.

   (b) What is the morphological nature of clove that is economically important?

   (c) Name one high-yielding variety of wheat.

   (d) What is androgenesis?

   (e) What is DNA fingerprinting?

   (f) Write the full form of SNP.

   (g) Define totipotency.

   (h) Write down the family of soybean.

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15

   (a) Write down the processing of tea. 5

   (b) Define micropropagation. List out its important application. 5

   (c) Differentiate between RAPD and RFLP. 5

   (d) Write short notes on:

   (i) Haploid culture

   (ii) Application of ELISA.

   (e) Write the scientific name, family, parts used and uses of cotton. 1+1+1+2

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20

   (a) What do you mean by endosperm culture? Briefly describe the protocol of endosperm culture. Give important applications of endosperm culture. 1+6+3 =10

   (b) Write down the scientific name, family and uses of (i) soybean and (ii) ground nut. $(1\frac{1}{2}+1\frac{1}{2}+2)\times2$ = 10

   (c) Write short notes on: 5+5 = 10

   (i) Hybridoma and monoclonal antibodies

   (ii) Human gene therapy.

   (d) What is Vavilovian centres of origin of crop plants. Discuss the different centres of origin of crop plants as suggested by Vavilov. 2+8 = 10

PAPER-GE-6

ENVIRONMENTAL BIOTECHNOLOGY

GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5

   (a) What is green-house effect?

   (b) What is Ozone hole?

   (c) What is biomagnification?

   (d) What is activated sludge?

   (e) What is xenobiotics?

   (f) Where was Chipko Movement started?

   (g) What is the full form of UNCED?

   (h) What is meant by sustainable development?

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15

   (a) What are the different methods of treatments of household affluents?   5

   (b) What is environmental pollution? Write down the different types of environmental pollution.   1+4 = 5

   (c) What is acid rain? Discuss the anthropogenic activities responsible for acid rain.   1+4 = 5

   (d) What are biopesticides? How are they effective in controlling the pests?   1+4 = 5

   (e) Write short notes on: $2\frac{1}{2} + 2\frac{1}{2} = 5$

   (i) Ramsar sites

   (ii) Wildlife Protection Act, 1972.

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20

   (a) Briefly write down the roles played by N.G.Os in environmental movements in India.   10

   (b) What is water pollution? Write down the sources of water pollution. How can water pollution be controlled?   1+4+5 = 10

   (c) Write short notes on: 5+5 = 10

   (i) Xenobiotics in environment

   (ii) Environmental awareness.

   (d) Discuss the important features of Forest Conservation Act, 1980. Write down the important outcome of Kyoto Protocol.   5+5 = 10

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