

Total No. of Questions : 9] [Total No. of Printed Pages : 4
(1107)

**UG (CBCS) RUSA Ist Semester (Old)
Examination**

112

BOTANY

(Phycology, Mycology and Plant Pathology)

(Major/Minor)

BSCBOT-0101

Time : 3 Hours]

[Maximum Marks : 40

Note :- (i) Attempt *five* questions in all. Question No. 1 is compulsory.

(ii) Attempt *one* question each from Sections B, C, D and E.

Section-A

1. (a) (i) Luxuriant growth of algae in water often imparting colour to water is called

(ii) is the reserve food in class Phodophyceal.

- (iii) In volvocales, the excess photosynthates are stored in form of
- (iv) A thick strand of underground hyphae resembling a root is known as
- (v) Unlike plant cell-walls which contain cellulose, the cell-wall in most fungi contain
- (vi) The obligate parasitic fungi absorb their nourishment from host cell through 6×1=6

- (b) (i) Differentiate between rust and smut disease.
- (ii) Differentiate between asexual and sexual reproduction. 2×2=4

Section-B

- 2. (a) Describe the mode of reproduction in diatoms. 3½
- (b) Write short notes on the following :
 - (i) Heterocyst
 - (ii) Pigment constitution of phaeophyceal and Rhodophyceal 1½+2½

3. (a) Explain post-fertilization change in *Polysiphonia*.
(b) Describe the mode of reproduction in oedogonium. 3+4½

Section-C

4. (a) With suitable diagrams only explain the mode of reproduction in *Penicillium*. 5
(b) Haplo-diplontic life-cycle in *Neurospora*. 2½
5. (a) Write short notes on any *two* of the following :
(i) Sporophore of *Agaricus*
(ii) Structure of yeast
(iii) *Colletotrichum* 2½×2
- (b) Explain aecidial cup in *Puccinia*. 2½

Section-D

Describe the symptoms and life-cycle of the following diseases :

- (i) Late-blight of potato
(ii) Loose smut of wheat
(iii) Citrus Canker 2½×3

7. Write pathological notes on the following :

(i) Apple Scals

(ii) Black stem rust of wheat

3+4½

Section-E

8. Write notes on the following :

(i) Foliose lichen

(ii) Soredium

(iii) Reproduction in lichens

2+2+3½

9. Give an account of ecological and economic importance of lichens.

7½

Roll No.

Total No. of Questions : 9]
(2042)

[Total No. of Printed Pages : 3

**UGC (CBCS) Vith Semester (New)
Examination**

246

B.Sc. BOTANY

(Cell and Molecular Biology)

(DSE)

Paper : BOTA 601

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in total. Question No. 1 of Part-A is compulsory. Attempt *one* question each from Parts-B, C, D and E. Attempt all parts of a question together. Draw neat and clean well-labelled diagrams wherever required.

Part-A

(Compulsory Question)

1. All parts of this question are compulsory :
 - (a) Define resolving power of microscope.
 - (b) Which type of ribosomes are found in prokaryotic cell ?

CH-446

(1)

Turn Over

- (c) Name any *one* marker enzyme of mitochondria.
- (d) Which organelle is known as suicidal bags of the cell ?
- (e) Who proposed nucleosome model of chromosome structure ?
- (f) Middle lamella is primarily composed of
- (g) In which stage of prophase-I of meiosis crossing-over takes place ?
- (h) G_1 , S and G_2 phases collectively constitute which phase of cell cycle ?
- (i) Nucleotide consists of, and
- (j) Name any *one* termination codon. 1×10=1

Part-B

2. (a) Differentiate between light microscope and electron microscope.
- (b) Write short note on sample preparation for electron microscopy. 5,
3. (a) Draw well-labelled diagram of eukaryotic cell.
- (b) Write postulates of cell theory and give its limitations. 5,

Part-C

4. (a) Give an account of symbiont hypothesis of mitochondrial origin.
- (b) Enlist functions of peroxisomes. 5,5
5. Write short notes on the following :
- (a) Nuclear pore complex
- (b) Ribosome structure 5,5

Part-D

6. Write short notes on the following :
- (a) Membrane proteins
- (b) Cell wall 5,5
7. Write short notes on the following :
- (a) Cell cycle
- (b) Significance of meiosis 5,5

Part-E

8. Write short notes on the following :
- (a) Griffith's transformation experiment
- (b) DNA replication in prokaryotes 5,5
9. Write short notes on the following :
- (a) Genetic code
- (b) Lac operon 5,5

Roll No.

Total No. of Questions : 9]
(1048)

[Total No. of Printed Pages : 4

**UGC (CBCS) B.Sc. IInd Semester (New)
Examination**

977

BOTANY

(Plant Ecology and Taxonomy)

(Core)

Paper : BOTA-201

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all. Question No. 1 in Part-A is compulsory. Attempt *one* question each from Parts B, C, D and E. Attempt all parts of a question together.

Part-A

(Compulsory Question)

1. All parts are compulsory :

(i) Who coined the term ecosystem ?

(ii) Define biological spectrum.

(iii) Describe the Schimper's 2nd Law.

C-377

(1)

Turn Over

- (iv) What is edge-effect ?
- (v) The bacteria and fungi in an ecosystem represents the
- (vi) Define beta taxonomy.
- (vii) Who is known as the father of Indian plant taxonomy ?
- (viii) Where is world's largest herbarium located ?
- (ix) What is lectotype ?
- (x) Who developed the concept of numerical taxonomy ? 1×10=10

Part-B

- (a) What is Soil Profile ? Discuss the various soil horizons.
- (b) (i) What are limiting factors ? Discuss with suitable examples.
- (ii) Discuss the various forms of precipitation. 5+5=10
- Or*
- (a) Discuss in detail the morphological and anatomical adaptations in xerophytes.
- (b) (i) Describe the ecophysiological responses of plants to light.
- (ii) Draw the nitrogen cycle. 5+5=10

Part-C

4. (a) Define Community. What are quantitative characteristics of a plant community ?
- (b) Define ecological succession. Discuss the various stages of hydrosere succession in a water body.
- 5+5=10

Or

5. (a) What is ecological pyramid ? Discuss the pyramids of number biomass and energy in ecosystem.
- (b) What do you understand by the term endemism ? Discuss endemism with reference to India.
- 5+5=10

Part-D

6. (a) What are the aims and objectives of plant taxonomy ?
- (b) Briefly discuss the role of molecular systematics in plant taxonomy.
- (c) What is taxonomic hierarchy ? Briefly discuss the ranks in taxonomic structure.
- (d) Discuss homonyms, basionyms and tautonyms.
- 4×2½=10

Or

7. (a) What are identification keys ? Discuss the various types of identification keys with suitable examples from the plant kingdom.

- (b) (i) Define a botanical garden. What is its role ?
- (ii) What do you understand by the limitation of the principle of priority ? 5+5=10

Part-E

8. (a) What is chemotaxonomy ? Discuss the various biomolecules used in taxonomic studies with examples.
- (b) (i) Discuss the rules of rejection of names of plants with suitable examples.
- (ii) What is effective publication ? Discuss with examples. 5+5=10

Or

9. (a) Give brief outline of Engler and Prantl system of plant classification. Also discuss its merits and demerits.
- (b) What is cluster analysis ? Differentiate between cladistic and phenetic methods with the help of suitable examples. 5+5=10

Total No. of Questions : 9]
(1049)

[Total No. of Printed Pages : 4

UG (CBCS) Ist Year Annual Examination
2010

B.Sc. BOTANY

(Plant Ecology and Taxonomy)

(Core)

Paper : BOTA 102

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all. Question No. 1 of Section-A is compulsory. Attempt *one* question each from Sections-B, C, D and E. Attempt all parts of a question together.

Section-A

(Compulsory Question)

1. All parts are compulsory :

- (i) The study of group of organisms interacting among themselves is called

- (ii) The uppermost layer of water body is known as
- (iii) is the water falling as large balls composed of ice.
- (iv) Who is considered as 'Father of Ecology' ?
- (v) are the woody climbers.
- (vi) The organisms which breakdown complex organic matter in plants are called
- (vii) Which is the greatest herbarium of the world ?
- (viii) Who coined the term 'Taxonomy' ?
- (ix) is the basic unit of taxonomic studies.
- (x) What is an Isotype ? 1×10=10

Section-B

2. (a) Explain the origin and formation of Soil.
- (b) Give an account of morphological adaptations in Hydrophytes with examples. 5+5=10

Or

- (a) Explain the influence of water and wind on the distribution of vegetation
- (b) Discuss anatomical adaptations in Xerophytes. $5+5=10$

Section-C

- (a) Describe the various life forms and biological spectrum in detail.
- (b) What is Ecological Succession ? Describe the stages of succession on a bare rocky area. $5+5=10$

Or

- (a) What is Food Chain and Food Web ? Explain in detail.
- (b) Explain the quantitative characters of a plant community. $5+5=10$

Section-D

- (a) What is a Herbarium ? How is it prepared and preserved ?
- (b) Explain the different Taxonomic Groups. $5+5=10$

Or

7. What are Taxonomic Identification Keys ? Explain the different types of keys in detail and give the merits and demerits of them. 10

Section-E

8. (a) Give the principles and rules of ICBN. What is Typification ?
- (b) Give the brief outline of Bentham and Hooker's system of classification. Give its merits and demerits. 5+5=10

Or

9. Write short notes on the following :

- (a) Biometrics
- (b) Operative taxonomic units
- (c) Cluster models
- (d) Binomial nomenclature
- (e) Cladograms 2×5=10

Roll No.

Total No. of Questions : 9]
(2093)

[Total No. of Printed Pages : 4

UG (CBCS) IInd Year (Suppl.) Examination
2095

B.Sc. BOTANY

(Plant Anatomy and Embryology)

(DSC-IA)

Paper : III BOTA 201

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all, selecting *one* question from each Section-B, C, D and E. Question No. 1 of Section-A is compulsory. Attempt all subparts of a question together.

Section-A

(Compulsory Question)

1. (i) What is Dendrochronology ?
- (ii) Who proposed Tunica corpus theory ?
- (iii) Who is autogamy ?

(iv) Which meristem helps in increasing girth of stem ?

(v) Sunken stomata are present in hydrophytes.

(True/False)

(vi) Bone like sclereids are known as

(vii) wood and autumn wood of one year constitutes an annual ring.

(viii) The knob like terminal part of stamen is known as

(ix) Double fertilization was discovered by

(x) An ovule surrounded by one integument is known as ovule.

1×10=10

Section-B

(a) What is shoot apical meristem ? Explain different theories regarding shoot apical meristem.

(b) What is phloem ? Explain its components and function in detail.

5+5=10

3. Differentiate between :

(i) Parenchyma and Collenchyma

(ii) Protoxylem and Metaxylem

(iii) Fibre and Sclereid

(iv) Tracheid and Vessel.

$2\frac{1}{2} \times 4 = 10$

Section-C

4. (a) What is periderm ? Describe its structure in detail.

(b) Write a note on formation of annual rings. $5+5=10$

5. (a) Describe secondary growth in dicot stem.

(b) Differentiate between :

(i) Softwood and Heartwood

(ii) Phellem and Phelloderm

$5+5=10$

Section-D

6. (a) Comment upon the statement "A flower is a modified shoot".

(b) Describe with suitable diagrams various types of ovules found in angiosperms. $5+5=10$

7. (a) Write a note on entomophily.

(b) Describe the development of typical monosporic polygonum type of embryo sac. $5+5=10$

Section-E

8. (a) Define double fertilization in detail. Explain the process of double fertilization in an angiospermic plant.
- (b) Explain the various mechanisms for dispersal of fruits and seeds. 5+5=10
9. (a) Describe the development of typical dicot embryo. Give necessary diagrams.
- (b) Explain polyembryony in detail. 5+5=10

Roll No.

Total No. of Questions : 9]
(2041)

[Total No. of Printed Pages : 4

UG (CBCS) IIIrd Year (Annual) Examination
2536

B.Sc. BOTANY

(Economic Botany and Biotechnology)

(DSE-1A)

Paper : BOTA 301

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all, selecting *one* question from each of the Sections–B, C, D and E. Question No. 1 of Section–A is compulsory. Attempt all subparts of a question together.

Section–A

(Compulsory Question)

1. Attempt all the subparts. Each subpart carries 1 mark.
 - (i) DNA Ligase performs the functions of :
 - (a) Joining the two DNA fragments
 - (b) Cutting the two DNA fragments

(c) 5' → 3' polymerase activity

(d) 3' → 5' polymerase activity

(Choose the correct option).

(ii) Red rust of tea is caused by green algae. This statement is True or False.

(iii) Expand the term ELISA.

(iv) Name the plant where a positively geotropic Gynophore is formed after the fertilization.

(v) Which part of *Curcuma longa* is used as spice ?

(vi) The fruit of family Poaceae is known as

(vii) Name the bacteria used for gene mediated transfer in plants.

(viii) What is the name of the protein present in wheat ?

(ix) Haploid plants are raised from male gametophytes through the technique known as

(x) Central Rice Research Institute is situated at

Section-B

4. (a) Explain the center of origin, cultivation practices, varieties and economic importance of wheat.
- (b) Write the botanical name, family and plant part used as the spice and other uses of black pepper and clove. 6+4=10
5. (a) Write a note on morphology, cultivation, varieties and uses of Soyabean and Potato.
- (b) What are the centers of origin ? Write the name of geographical centers explained by N.I. Vavilov. 6+4=10

Section-C

4. (a) What is Black Tea ? Explain the processing of black tea in detail.
- (b) Write the botanical name, family and medicinal uses of *Tinospora* and *Ocimum*. 5+5=10
5. (a) Write a note on morphology, cultivation practices of sugarcane. Explain the process of preparation of sugar from it.
- (b) Write a note on morphology and uses of cotton plants. 6+4=10

Section-D

6. (a) Write down the application of plant tissue culture in agriculture.
- (b) Write a note on sterilizations techniques used in plant tissue culture. $5+5=10$
7. (a) Explain the various steps involved in Protoplast culture technique.
- (b) Write a note on culture media, its components and its sterilization used in plant tissue culture. $5+5=10$

Section-E

8. (a) What is Southern blotting ? Explain the various steps of this technique.
- (b) Write a note on cloning vehicles used in biotechnology. $5+5=10$
9. (a) What are monoclonal antibodies ? Write the process of Hybridoma production.
- (b) What is DNA sequencing ? Explain the chain termination process of DNA sequencing. $6+4=10$

Roll No.

Total No. of Questions : 9]
(2093)

[Total No. of Printed Pages : 4

UG (CBCS) IIIrd Year (Suppl.) Examination

2249

B.Sc. BOTANY

(Economic Botany and Biotechnology)

(DSE-1A)

Paper : BOTA 301

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all, selecting *one* question from each of the Section B, C, D and E. Question No. 1 of Section-A is compulsory. Attempt all parts of a question together.

Section-A

(Compulsory Question)

1. Do as directed :

(i) Give the botanical name of Gram.

(ii) Name a country which is regarded as '*The Home of Spices*'.

C-249

(1)

Turn Over

- (iii) In India, wheat is grown as Rabi crop.
(True/False)
- (iv) Coffee and Tea are beverages.
- (v) Morphine is obtained from :
- (a) *Rauvolfia serpentina*
 - (b) *Withania somnifera*
 - (c) *Papaver somnifera*
 - (d) *Datura inoxia*
- (vi) is the ability of a single cell to grow and form all the differentiated cells in an organism.
- (vii) is an excised piece of leaf or stem tissue used in micropropagation.
- (viii) A plasmid :
- (a) is a circular DNA
 - (b) always contain an origin of replication
 - (c) contains one or more restriction sites
 - (d) All of these

(ix) Flavr Savr is genetically engineered variety of crop. (Tomato/Apple)

(x) Plant genetic engineering helps in production of golden rice rich in :

(a) Protein

(b) Vitamin A

(c) Carbohydrate

(d) Gold

1×10=10

Section-B

2. (a) Give the scientific name and family of wheat. Describe in brief cultivation practices and uses of wheat.

(b) Give the scientific name, family, part used and location of research centre of Potato. 6,4

3. Discuss in detail the botanical characteristics and uses of rice. Name high yielding cultivars of rice. 10

Section-C

4. (a) Give the botanical name and family of cotton. Discuss its botanical characters.

(b) Discuss the importance of peanut. 6,4

5. (a) Give the botanical characteristic of sugarcane. Discuss the processing of sugarcane.

(b) What is difference between Green and Black Tea ? 6,4

Section-D

6. Write short notes on the following :

(i) Micropropagation

(ii) Endosperm Culture

5×2=10

7. What do you understand by Plant Tissue Culture Technique ? Explain its significance in horticulture and forestry.

10

Section-E

8. (a) What are Cloning Vehicles ? Explain its various kinds.

(b) Explain the uses of recombinant DNA technology.

5,5

9. (a) Explain in brief the process of DNA fingerprinting.

5

(b) Write short notes on the following :

(i) Molecular Markers

(ii) Blotting techniques

2½ + 2½ = 5

Roll No.

Total No. of Questions : 9]
(2093)

[Total No. of Printed Pages : 4

UG (CBCS) IIIrd Year (Suppl.) Examination

2250

B.Sc. BOTANY

(Cell and Molecular Biology)

(DSE-1B)

Paper : BOTA 303

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all. Q. No. 1 is compulsory.
Attempt *one* question from each Section-B, C, D
and E.

Section-A

(Compulsory Question)

1. Do as directed :

(i) Light microscope was discovered by

(ii) Semi-conservative DNA replication was proved
by

C-250

(1)

Turn Over

- (iii) DNA from RNA is synthesized by enzyme
- (iv) Who gave cell theory ?
- (v) Pyrimidines in DNA are and
- (vi) Photorespiration occurs in
- (vii) Synaptonemal complex is formed during stage of Prophase I.
- (viii) Lagging strand of DNA produce fragments.
- (ix) DNA segment that joins two nucleosomes is called
- (x) Name the suicidal bags of the cell. 1×10=10

Section-B

2. (a) Describe the principle and working of a simple compound microscope.
- (b) Draw well labelled plant cell.
- (c) Write a note on fixation. 5,3,2
3. (a) Describe the structure and functions of mitochondria.
- (b) What is the composition of chloroplast ?
- (c) Differentiate between STEM and TEM. 5,3,2

Section-C

4. (a) Explain the Ultrastructure of Nucleus. What is Nuclear Pore Complex ? Give its importance.
- (b) Why Golgi bodies are called traffic police of the cell ?
- (c) Differentiate between Peroxisomes and Lysosomes. 5,2,3
5. (a) What is Plasmalemma ? Explain fluid mosaic model of plasma membrane.
- (b) What are the functions of cell wall ?
- (c) Differentiate between RER and SER. 5,3,2

Section-D

6. (a) Define Mitosis. Why is it called equational division ? Draw well labelled diagrams of stages of mitosis.
- (b) Define cell cycle and give its importance.
- (c) Write a note on types of Genetic Material. 5,3,2
7. (a) What is DNA replication ? Describe the experiment that proves its semiconservative nature.
- (b) Draw well labelled DNA double helix.
- (c) Differentiate between DNA and RNA. 5,3,2

Section-E

8. (a) What is transcription ? Discuss various steps and enzymes of transcription.
- (b) Define genetic code and give its characteristics. 6,4
9. (a) Explain in detail the gene regulation in Eukaryotes.
- (b) Describe the structure and function of ribosomes. 6,4

Roll No.

Total No. of Questions : 9]
(2033)

[Total No. of Printed Pages : 4

UG (CBCS) Ist Year Annual Examination

3009

B.Sc. BOTANY

[Biodiversity (Algae, Microbes, Fungi and
Archegoniates)]

(Core)

Paper : BOTA-101

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all. Q. No. 1 is compulsory. Attempt *one* question each from Sections A, B, C and D. Draw well-labelled diagrams wherever necessary. All questions carry equal marks.

(Compulsory Question)

1. Fill in the blanks/Give one word/one sentence answers to the following (All parts are compulsory) :

- (i) Biologists consider viruses as while biochemists consider them as
- (ii) Ribosomes of bacteria are of type.

CA-209

(1)

Turn Over

- (iii) Gongrosira stage occurs in
- (iv) Cell wall of fungal cell is made up of
- (v) The fertile portion of *Funaria* capsule is called
- (vi) Asexual reproduction in *Polysiphonia* occurs by
- (vii) What is the common name of *Equisetum* ?
- (viii) The wonder drug 'Pencillin' is obtained from which species of *Penicillium* ?
- (ix) Mycorrhizal roots are found in which gymnosperm ?
- (x) What is the nature of association between algae and fungi in Lichens ?

1×10=10

Section-A

- (a) Give an account of economic importance of Algae.
- (b) Give a detail account of sexual reproduction in *Polysiphonia*.

Or

3. (a) What are the various types of life-cycles found in algae ? Draw diagrams also.
- (b) Describe the process of cell-division in *Oedogonium*.
- (c) Describe the position of sex organs in *Vaucheria*. 5,3,2

Section-B

- (a) Draw diagrams only to show the various stages in the life-cycle of *Puccinia Graminis*.
- (b) Describe sexual reproduction in *Rhizopus*. 6,4

Or

- (a) Describe the morphology and disease cycle of the pathogen which causes apple scab disease.
- (b) Give the detailed structure of basidiocarp of *Agraricus*. 5,5

Section-C

- (a) Explain the lytic and lysogenic life-cycles in viruses.
- (b) Describe the type of bacteria on the basis of shape, flagellation and nutrition. 5,5

Or

7. (a) Draw a neat and well-labelled diagram of *Funaria* sporogonium.
- (b) Explain sexual reproduction in *Marchantia*. 5,5

Section-D

8. (a) Describe the spore producing organs and asexual reproduction in *Selaginella*.
- (b) Draw a neat and well-labelled diagram of *Pinus* needle and mention its xerophytic characters.
- (c) Give the external features of *Eqisetum*. 4,4,2

Or

9. (a) Draw internal structure of stem of *Eqisetum*.
What is the difference in the nodal and internodal regions ?
- (b) Describe the structure of male cone, microsporangia, microspores and megasporophyll and ovule of *Cycas*. 4,6

Roll No.

Total No. of Questions : 9]
(2033)

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UG (CBCS) IInd Year Annual Examination

3111

B.Sc. BOTANY

(Plant Anatomy and Embryology)

(DSC-IA)

Paper : III BOTA 201

Time : 3 Hours]

[Maximum Marks : 50

Note :- Question paper contains nine questions. Each question carries equal marks. Question No. 1 is compulsory. Attempt one question each from Sections—A, B, C and D.

1. (i) What is syndetocheilic stomata ?

(ii) Which one is heart wood :

(a) Duramen

(b) Alburnum

(iii) Hairs are elongated out growth of
cells.

CA-311

(1)

Turn Over

(iv) Casparian strips or bands present on radial wall of endodermal cells are chiefly made up of

(v) The cells cut towards outside of phellogen form

(vi) Verticillaster inflorescence is found in the members of family

(vii) Tapetum is in function.

(viii) Pollination done by bats is known as

(ix) What is Chalazogamy ?

(x) The seeds which, store food materials in their cotyledons are called. 1×10=10

Section-A

2. (a) Classify meristems on the basis of their origin and method of development.

(b) Describe internal structure of a normal dicotyledonous leaf along with well labelled diagram. 5,5

Or

3. (a) What is permanent tissue ? Give detailed account of parenchymatous permanent tissue, along with functions.
- (b) Classify stomata on the basis of their distribution on leaf. 7,3

Section-B

4. (a) What is secondary growth ? Describe it in dicot stem.
- (b) Differentiate heartwood and sapwood. 7,3

Or

5. What do you understand by anomalous secondary growth ? Discuss it in *Boerhaavia* and *Dracaena* stem. 10

Section-C

6. (a) Describe various types of angiospermic rules on the basis of shape and orientation.

(b) Write short notes on the following :

(i) Epigynous flower

(ii) Parietal placentation

6,4

Or

7. (a) What is Self-pollination ? Discuss its types.

What are the advantages of Self-pollination ?

(b) Explain pollination in *Salvia*.

7,3

Section-D

8. What is double fertilization ? Explain the formation of three different types of endosperms along with suitable diagrams.

2+8=10

Or

9. Write short notes on the following :

(a) Albuminous and exalbuminous seeds

(b) Anemochory

(c) Scarification

(d) Stratification

3,3,2,2=10

Roll No.

Total No. of Questions : 9]
(2032)

[Total No. of Printed Pages : 4

**UG (CBCS) IIIrd Year (Annual)
Examination**

3236

B.Sc. BOTANY

(Economic Botany and Biotechnology)

(DSE-1A)

Paper : BOTA 301

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all, selecting *one* question from each of the Sections-B, C, D and E. Question No. 1 of Section-A is compulsory.

Section-A

(Compulsory Question)

- (i) Central potato research institute is situated in
- (ii) is the centre of origin of coffee.
- (iii) Write the botanical name of Tulsi.

- (iv) Who is known as father of plant tissue culture ?
- (v) Expand the term RAPD.
- (vi) Hybridoma technology was invented by
- (vii) Sugar is stored in part of the sugarcane plant.
- (viii) Write the role of DNA ligase.
- (ix) During DNA replication strand possess Okazaki fragments.
- (x) The refreshing property of tea is due to
1×10=10

Section-B

2. (a) What is a centre of origin ? Write the names of various centres of origin identified by N.I. Vavilov.
- (b) Write the botanical names of any *five* spices and assign them to their respective families. 5,5
3. (a) Give a detailed account on the origin of hexaploid wheat from its wild relatives.
- (b) Write the botanical names of old world and new world cotton species. 6,4

Section-C

4. Differentiate between the following :

(a) Spices and condiments.

(b) Bast fibres and surface fibres.

(c) Soft wheat and hard wheat.

(d) Cereals and pulses.

(e) Alcoholic and non-alcoholic beverages. $2 \times 5 = 10$

5. (a) Why tea is a refreshing beverage ? Compare the processing of tea leaves into black and green tea.

(b) Give a general account on the processing of coffee beans by dry and wet process. $6,4$

Section-D

6. (a) Discuss the applications of plant tissue culture in agriculture, horticulture and forestry.

(b) Write the various methods of sterilization used during plant tissue culture. $5,5$

7. What are Haploids ? Give a detailed account on the production of haploids by androgenesis. 10

Section-E

8. (a) Give an outline of gene cloning procedure and write the names of various cloning vehicles. 6,4
- (b) Write a note on restriction enzymes. 6,4
9. Give a general account on the following :
- (a) Hybridoma technology
- (b) ELISA 6,4

Or

Who discovered polymerase chain reaction ? With the help of suitable diagrams illustrate the procedure of polymerase chain reaction and discuss the significance. 10

Roll No.

Total No. of Questions : 9]
(2032)

[Total No. of Printed Pages : 4

UG (CBCS) IIIrd Year (Annual) Examination

3238

B.Sc. BOTANY

(Cell and Molecular Biology)

(DSE-1B)

Paper : BOTA 303

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all. Q. No. 1 is compulsory.
Attempt *one* question from each Section-B, C, D
and E. All questions carry equal marks.

Section-A

(Compulsory Question)

1. Do as required :

- (i) Which cell organelle is called protein factory ?
- (ii) Who assembled the first primitive microscope ?
- (iii) Write full form of DPX.

CH-38

(15)

Turn Over

- (iv) How many structural genes are present in Lac Operon ?
- (v) Write the names of pyrimidines present in DNA structure.
- (vi) A selectively permeable membrane allows the passage of both solvent and solute.

(True/False)

(vii) and are initiation codons.

(viii) What is Central Dogma ?

(ix) Karyokinesis refers to the division of

(x) DNA with left-handed rotation is :

(a) A-DNA

(b) B-DNA

(c) C-DNA

(d) Z-DNA

1×10=10

Section-B

2. (a) What is STEM ? Describe the principle, applications and parts of a STEM.

(b) Draw well labelled ultrastructure of a prokaryotic cell.

(c) How do plant cells differ from animal cells. 5,3,2

- (a) Draw well labelled diagram showing ultrastructure of a Mitochondrion. Why mitochondria are called power house of the cell ?
- (b) Write chemical composition of chloroplasts in higher plants and nature of chloroplast DNA.
- (c) Name any *two* marker enzymes present in chloroplast. 5,3,2

Section-C

- (a) Describe the structure and functions of the following :
- (i) Golgi apparatus
 - (ii) Lysosomes
- (b) Describe DNA packaging in Eukaryotes. 6,4
- (a) Describe the model of membrane proposed by Sanger and Nicolson in 1972.
- (b) Define Cell Wall. Who first saw the cell wall in the cork cells ? Write functions of the cell wall. 6,4

Section-D

6. (a) Describe Prophase-I stage of Meiosis-I.
- (b) Write significance of Mitosis.
- (c) Describe in brief the methods of plant cytokinesis. 5,3,2
7. (a) Describe Hershey-Chase bacteriophage experiment.
- (b) Describe Semiconservative mode of DNA replication.
- (c) Write note on 'Chargaff's Rules'. 5,3,2

Section-E

1. (a) Describe the mechanism for the synthesis of RNA from DNA.
- (b) Differentiate between *mRNA* and *tRNA*.
- (c) Write important properties of Genetic Code. 5,3,2
2. (a) Describe the mechanism for the synthesis of protein.
- (b) What do you mean by gene expression ?
Explain the mechanism for regulation of gene expression in prokaryotes. 5,5

Roll No.

Total No. of Questions : 9]
(2032)

[Total No. of Printed Pages : 4

UG (CBCS) IIIrd Year (Annual) Examination

3242

B.Sc. BOTANY

(Mushroom Cultivation)

(SEC-II)

Paper : BOTA 307

Time : 3 Hours]

[Maximum Marks : 70

Note :- Attempt *five* questions in all. Q. No. 1 (Part-A) is compulsory. Attempt *one* question from each Part B, C, D and E. Attempt all parts of a question together. Draw neat and clean, well labelled diagrams wherever required.

Part-A

(Compulsory Question)

1. (A) All parts of this question are compulsory :
- The National Centre for Mushroom Research and Training was established on
 - What is the scientific name of Guchhi ?

(iii) Mushroom proteins are rich in amino acids

.....

(iv) Poisonous mushrooms are commonly known as

(v) A mushroom which causes gastrointestinal irritations is :

(a) *Agaricus bisporous*

(b) *Agaricus placomyces*

(c) *Pleurotus sajor-caju*

(d) *Pleurotus ostreatus*

(vi) is called as seed of mushroom.

(vii) Which substrate material can be used for preparing spawn ?

(a) Wheat grains (b) Sorghum grains

(c) Saw dust (d) All of these

(viii) *Pleurotus flabellatus* is a poisonous mushroom. (True or False)

(ix) Which mushroom is known as Chinese mushroom ?

(x) Dry bubble of mushroom is caused by

.....

(a) *Mycogone pernicioso*

(b) *Verticillium fungicola*

(c) *Coprinus lagopus*

(d) *Diehliomyces microsporus*

1×10=10

(B) Write short notes on the following :

(i) Casing in *Agaricus* cultivation.

(ii) Pickling of Mushrooms.

2×2=4

Part-B

2. (a) Write a detailed note on history of mushroom cultivation.

(b) Describe sexual reproduction and development of fructification in *Agaricus*.

7,7

3. (a) Write an essay on wild edible mushrooms of India.

(b) Write a note on anti-tumor properties of Mushrooms.

(c) Discuss any *five* most toxic mushrooms found in India.

6,3,5

Part-C

(a) Discuss the important equipments used during mushroom cultivation.

(b) How the bed spawn is produced ?

(c) Briefly discuss different types of spawns.

7,3,4

(a) Define Pure Culture. Discuss the methods of preparing the pure culture of a mushroom.

(b) Write a detailed note on sterilisation techniques used in mushroom culture technology.

7,7

Part-D

- (a) Define cropping and discuss the process of cropping in *Agaricus* cultivation.
- (b) Discuss the short method of composting in *Agaricus* cultivation.
- (c) Discuss the various recommended strains of oyster mushroom for cultivation. 6,3,5
- (a) Discuss the steam sterilisation of substrates in *Pleurotus* cultivation.
- (b) Name four commercially cultivated species of *Volvariella* in the world.
- (c) Describe in detail the various steps in cultivation of paddy straw mushroom. 3,4,7

Part-E

- (a) Define long term preservation of mushrooms and discuss its various methods.
- (b) Write a detailed note on diseases, disease symptoms, causal organisms and chemical control of fungal diseases of button mushroom. 6,8
- (a) Write a detailed note on steeping and pickling.
- (b) Discuss the various pests of mushrooms with control measures. 6,8

Roll No.

Total No. of Questions : 9]
(2033)

[Total No. of Printed Pages : 4

UG (CBCS) IIIrd Year Annual Examination
3305

B.Sc. BOTANY

(Economic Botany and Biotechnology)

(DSE-1A)

Paper : BOTA 301

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all, selecting *one* question from each of the Sections–B, C, D and E. Question No. 1 of Section–A is compulsory. Attempt all subparts of a question together.

Section–A

(Compulsory Question)

1. Do as directed :

(i) The source of cotton fibre is

(a) Roots

(b) Stems

(c) Leaves

(d) Seeds

CA–505

(1)

Turn Over

- (ii) Give the botanical name of rice.
- (iii) The vegetative propagation in sugarcane is done by
- (a) panicle (b) root
- (c) stem (d) bulbils
- (iv) Expand the term IARI.
- (v) Crushing, tearing and curling (CTC) are common method applied for the manufacturing of tea. (True/False)
- (vi) Organogenesis refers to :
- (a) Formation of callus tissue
- (b) Formation of roots and shoots from callus
- (c) Both (a) and (b)
- (d) None of the above
- (vii) is used for sterilization of media.
- (a) Incubator (b) Refrigerator
- (c) Laminar air flow (d) Autoclave
- (viii) ELISA stands for

(ix) Southern blotting technique is used to detect sequence in tissue sample.

- (a) DNA (b) RNA
(c) Protein (d) Starch

(x) Which of the following is not used as a vector for cloning of DNA ?

- (a) pBR322 (b) RAPD
(c) YAC (d) EMBL3 $1 \times 10 = 10$

Section-B

2. (a) Write a brief note on the major research institute of crop plants of India. 5
(b) Write short notes on the following :
(i) Dry cultivation and wet cultivation of rice.
(ii) Origin of wheat. $2\frac{1}{2} + 2\frac{1}{2}$
3. (a) Write the botanical name, family and part used of five common spices.
(b) Define Pulses. Give the uses of Soyabean. 5,5

Section-C

4. Write short notes on the following :
(a) Non-alcoholic beverages
(b) Groundnut $5 \times 2 = 10$

5. Write a botanical name, family, part used and medicinal property of *five* medicinal plants. 10

Section-D

6. Write short notes on the following :
- (a) Haploid production
 - (b) Eembryo culture 5×2=10
7. (a) Describe the steps required for plant tissue culture.
- (b) Discuss the application of plant tissue culture in agriculture. 6,4

Section-E

8. (a) What is *r*-DNA ? Write in brief the basic steps involved in cloning.
- (b) What are transgenic plants ? What role will such plants play in future crop improvement programmes ? 5,5
9. Write short notes on the following :
- (a) Monoclonal antibodies
 - (b) PCR 5×2=10

Roll No.

Total No. of Questions : 9]
(2033)

[Total No. of Printed Pages : 4

UG (CBCS) IIIrd Year Annual Examination

3307

B.Sc. BOTANY

(Cell and Molecular Biology)

(DSE-1B)

Paper : BOTA 303

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all. Q. No. 1 is compulsory.
Attempt *one* question from each Section-B, C, D
and E. All questions carry equal marks.

Section-A

(Compulsory Question)

1. Do as directed :

(i) microscope enable to study living cells.

(ii) Cell was discovered by

(iii) Which cell organelle is protein factory of cell ?

CA-507

(1)

Turn Over

- (iv) Nucleolus was discovered by
- (v) Crossing over occurs during stage.
- (vi) Middle lamella is made up of and
.....
- (vii) DNA replication occurs during phase.
- (viii) Name the purines present in DNA.
- (ix) Which enzyme is responsible for DNA replication ?
- (x) Name the initiation codon. 1×10=10

Section-B

2. (a) Draw well labelled prokaryotic cell. Differentiate between prokaryotic and eukaryotic cell.
- (b) How is light microscope differ from electron microscope ?
- (c) Define resolving and magnifying power of microscope. 5+3+2
3. (a) Describe ultrastructure and function of chloroplast.

(b) What do you mean by semiautonomous nature of mitochondria ?

(c) Describe the marker enzymes of mitochondria. 5+3+2

Section-C

i. (a) Discuss the structure and functions of endoplasmic reticulum.

(b) Explain briefly packaging of DNA in eukaryotes.

(c) Differentiate between Heterochromatin and Euchromatin. 5+3+2

i. (a) Describe the structure and functions of cell wall.

(b) Name the proteins and their functions present in cell membrane.

(c) What is selective permeable ? 5+3+2

Section-D

i. (a) Describe the cell cycle and its check points.

- (b) Draw well labelled diagrams of Zygotene and Pachytene.
- (c) What is B-DNA ? 5+3+2
7. (a) What is DNA replication ? Explain the various steps of replication of DNA.
- (b) Differentiate between RNA and DNA.
- (c) Write a short note on Satellite DNA. 5+3+2

Section-E

8. (a) Define Translation. What are different steps in Protein Synthesis ?
- (b) What is Genetic Code ? What are the characteristics of a genetic code ? 6+4
9. (a) Explain gene regulation in Prokaryotes with respect to Tryptophan Operon.
- (b) Give the structure and functions of *m*-RNA. 6+4

Roll No.

Total No. of Questions : 9]
(2033)

[Total No. of Printed Pages : 4

UG (CBCS) IIIrd Year Annual Examination

3311

B.Sc. BOTANY

(Mushroom Cultivation Technology)

(SEC-II)

Paper : BOTA 307

Time : 3 Hours]

[Maximum Marks : 70

Note :- Attempt *five* questions in all. Q. No. 1 (Part-A) is compulsory. Attempt *one* question from each Part B, C, D and E. Attempt all parts of a question together.

Part-A

(Compulsory Question)

1. (A) (i) Formaldehyde is used as in mushroom cultivation.
- (ii) The common name of *Pleurotus sajor-kaju* is :
 - (a) Shitake mushroom

CA-511

(1)

Turn Over

- (b) Button mushroom
 - (c) Paddy straw mushroom
 - (d) Oyster mushroom
- (iii) The cultivation of Paddy straw mushroom started in which country ?
- (iv) Preservation methods of mushrooms are :
- (a) Pickling
 - (b) Canning
 - (c) Both (a) and (b)
 - (d) None of the above
- (v) What is the duration between the flushes in mushroom crop ?
- (vi) In India, *Agaricus bisporus* was first cultivated in which state ?
- (vii) In which country mushroom cultivation started first ?
- (viii) Components of mushroom farm are :
- (a) Spawn unit
 - (b) Inoculation room
 - (c) Incubation room
 - (d) All of the above

(ix) Spawn is the of mushroom.

(a) Spores

(b) Mycellium

(c) Fruit

(d) Both (a) and (b)

(x) Wet bubble disease of mushroom is caused

by $1 \times 10 = 10$

(B) (i) What is 'casing' in mushroom cultivation ?

(ii) What is mother spawn ? $2 \times 2 = 4$

Part-B

2. (i) Write a detailed note on the history of mushroom cultivation.

(ii) Describe about different types of edible mushrooms available in India. $7,7$

3. (i) Give the medicinal benefits of mushrooms.

(ii) Write a detailed note on the nutritional value of mushrooms. $7,7$

Part-C

4. (i) Give a general account of poisonous mushrooms.
(ii) Discuss the methods of spawn production for mushroom cultivation. 7,7
5. (i) Describe the composting technology in mushroom production.
(ii) Describe the paddy straw mushroom cultivation in detail. 7,7

Part-D

6. Describe in detail the post harvesting and value addition in mushrooms. 14
7. Explain about the storage of mushrooms. 14

Part-E

8. (i) Write a detailed note on the marketing of mushrooms.
(ii) Discuss the importance of Regional and National Research Institutes of mushroom cultivation in India. 7,7
9. (i) Describe the various recipes of mushrooms.
(ii) Write a detailed note on the pests of mushrooms. 7,7

Roll No.

Total No. of Questions : 9]
(2033)

[Total No. of Printed Pages : 4

UG (CBCS) IInd Year Annual Examination

3113

B.Sc. BOTANY

(Biofertilizers)

(SEC-I)

Paper : BOTA 203

Time : 3 Hours]

[Maximum Marks : 70

Note :- Attempt *five* questions in all. Question No. 1 is compulsory. Select *one* question each from Sections-B, C, D and E. All questions carry equal marks

Section-A

1. (A) Fill in the blanks/Give one word answers to the following :

(i) Who discovered microbial world ?

(ii) is the first species of Rhizobia described by Frank in 1869.

(iii) is the natural process of decomposition of organic matter by microbes under controlled conditions.

(iv) Earthworms are in nature.

(v) How many polar flagella are present in *Azospirillum* ?

(vi) is an actual site of Nitrogen fixation in *Anabaena*

(vii) Nitrite is converted into nitrate in the soil with the help of bacteria.

(viii) is commonly known as red wriggler.

(ix) Write full form of YEMA.

(x) Nitrogen fixation requires enzyme. 1×10=10

(B) Give short answers of the following (any *two*):

(i) Differentiate between aerobic and anaerobic composting.

(ii) Discuss briefly the process of sporulation in *Frankia*.

(iii) Differentiate between Organic manures and Biofertilizers.

(iv) Describe the morphology of *Anabaena*. 2×2=4

Section-B

2. (a) Define organic fertilizers. Discuss the various types of organic manures.
- (b) Discuss the advantages and disadvantages of using Biofertilizers.

Or

3. (a) Explain the different sources and methods of Nitrogen fixation.
- (b) Discuss the process of isolation and identification of Rhizobium. 7+7=14

Section-C

4. (a) Write a detailed note on crops response to Azospirillum.
- (b) Explain the methods of isolation and mass multiplication of Azotobacter and preparation of biofertilizer.

Or

5. (a) Write a detailed note on the field application of Azospirillum based Biofertilizers.
- (b) Give an account of isolation, culturing, multiplication and culturing of phosphate solubilising bacteria. 7+7=14

Section-D

6. (a) Write a detailed note on Ectomycorrhiza.
(b) Elaborate the role of Azollae-Anabaena association in rice culture.

Or

7. (a) Give an account of distribution, thallus structure and cell structure of Cyanophyceae.
(b) Write a detailed account of Endomycorrhiza. 7+7=14

Section-E

8. (a) Define Vermiculture. Discuss the various methods of culturing of earthworms.
(b) Give the advantages and disadvantages of green manures.

Or

9. (a) Define composting. Discuss the various methods of composting.
(b) Give a detailed account of earthworms and their role in composting. 7+7=14