

First Semester M. Sc. Degree Examination

Branch : Botany

BO 211 – PHYCOLOGY, MYCOLOGY, MICROBIOLOGY AND PLANT PATHOLOGY

(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

Instruction : Draw diagrams and illustrate with examples wherever necessary

1. Answer the following questions

- 1) What is Irish moss?
- 2) Define peridium.
- 3) What is a chemostat?
- 4) Name the reserve food material in brown algae.
- 5) Causative organism of quick wilt of pepper.
- 6) What is capillitium?
- 7) Name the organism responsible for the name Red sea.
- 8) What are mollicutes?
- 9) What is spermatium and carpogonium?
- 10) Define BOD.

(10x1= 10 marks)

II Answer the following questions in **not** more than **50** words

11) a) Give the thallus structure of *Scytonema* with suitable diagram.

OR

b) Differentiate autospores and auxospores

12) a) Write notes on sexual reproduction in *Codium*.

OR

b) Explain sporangia formation in *Phytophthora*.

13) a) Draw the fructification of *Polyporus*.

OR

b) Name any four Indian mycologists.

14) a) Write notes on MPN.

OR

b) Comment on the structure of HIV.

15) a) Comment on the different types of Mycorrhiza.

OR

b) Name the causative organism and symptoms of Red rust of tea.

(5x2= 10 marks)

III Answer the following questions in **not** more than **150** words

16) a) Comment on the evolutionary significance of Chaetophorales

OR

- b) Write on the post fertilization changes in any two members of Rhodophyceae.
17) a) Vocales represent a dead line in evolution. Substantiate the statement.

OR

- b) Give the contribution of Indian Algologists.
18) a) Describe the thallus structure and reproduction in *Helminthosporium*,

OR

- b) Comment on the economic and ecological significance of lichens.
19) a) Write short notes on the growth and nutrition of microorganisms.

OR

- b) Give a brief description of the ultra-structure of a typical bacterium.
20) a) Comment on the biological methods of disease control.

OR

- b) Explain the symptoms, causal organism and disease cycle of powdery mildew in rubber.
21) a) Write an account of the asexual reproduction methods in *Aspergillus*.

OR

- b) State the principle and procedure of plant quarantine measures.
22) a) Describe in brief the industrial importance of microorganisms.

OR

- b) Explain the different biochemical defence mechanism in plants.

(7x5= 35 marks)

IV. Answer the following questions in **not** more than **250** words

- 23) a) Describe in detail about the classification of algae proposed by Lee.

OR

- b) Give a detailed account on the thallus variation exhibited by members of Chlorophyceae.
24) a) Write an essay on the classification of fungi proposed by Kirk.

OR

- b) Give an account on the process of municipal waste water treatment.

(2x10= 20 marks)

First Semester M.Sc Degree Examination

Branch: Botany

BO 212 - Bryophyta, Pteridophyta & Gymnosperms

(2019 Admission Onwards)

Time: 3 Hours

Max.Marks : 75

I. Answer the following questions.

1. Name a fossil Showing Sparganium type of cortical tissue, mention the major group to which it belongs.
2. Mention the various subdivisions of Mesozoic era in the Geological time scale.
3. What are retort cells, and where are they found.
4. Name an extant Pteridophyte which shows Secondary thickening.
5. Give an example for a "Filmy fern".
6. Name the source plant of the fossilised resin "Amber".
7. Name a Pteridophyte which has a layer of xylem sandwiched between two layers of phloem, in its vascular cylinder.
8. What are Girdle traces, where are they found.
9. Name the monotypic living fossil found in the Namib Desert region of Africa.
10. What is the anatomical peculiarity associated with the leaves of *Salvinia*.

(10x1=10 marks)

II. Answer the following in not more than 50 words.

11. a) Write a short note on the nature of Endosperm tissue of Gymnosperms.

OR

- b) What are Pleurocarpic mosses, give an example.

- 12.a) List out the methods of asexual reproduction among thalloid Liverworts.

OR

- b) Explain the terms, Overtopping and Syngensis.

13. a) What are Petrifications, explain.

OR

- b) Diagrammatically represent the various parts of the sporophyte of *Rhynia*.

14. a) Define the term Tent Pole, where is it found.

OR

- b) "Gymnosperm wood is generally termed as Soft wood", in spite of the fact that they contain some of the hardest timber trees like *Cedrus deodara*, Explain the reason for this disparity.

15. a) Discuss the term Cyadofilicales.

OR

- b) Differentiate Bract scales from Ovuliferous scales.

(5 x 2=10 marks)

III. Answer the following questions in not more than 150 words.

16. a) Anthocerotales are considered as the transition group, between thalloid liverworts and the more advanced true mosses, Discuss.

OR

b) Polytricales are considered to be the most advanced among the bryophytes, list out the reasons for this.

17. a) With suitable diagrams explain anatomy of the sorus in *Adiantum*.

OR

b) Diagrammatically explain the anatomy of the Sporocarp of *Salvinia*.

18. a) Explain the salient features of the *Pentoxylales*.

OR

b) Discuss the salient features of *Heterangium*.

19. a) Discuss the various trends in Gametophyte evolution among the Pteridophytes.

OR

b) Explain the various theories behind the origin of Sporophylls among the Pteridophytes.

20. a) With a diagram explain the anatomy of the Capsule of *Sphagnum*.

OR

b) Explain the structure of the male and female cones in *Welwitschia*.

21. a) Discuss the contributions of Prof. Birbal Sahni, in the field of Gymnosperm fossil history.

OR

b) "Prof. Shiv Ram Kashyap, is considered a giant among Indian Bryologists", Substantiate the statement, giving suitable reasons.

22. a) Discuss the role played by Pteridophytes as ecological indicators.

OR

b) Throw light on the role of Bryophytes as indicators of pollution.

(7x5 = 35 marks)

IV. Answer the following in not more than 250 words.

23. a) Discuss on the Economic importance of Gymnosperms.

OR

b) What is meant by the term Geological Time scale, explain how the time scale is organised.

24. a) Explain the life cycle of *Reboulia* with suitable diagrams, wherever necessary.

OR

b) Discuss the various views regarding Stellar evolution among Pteridophytes.

(2 x 10 = 20 marks)

First Semester M.Sc Degree Examination

Branch: Botany

**BO 213. HISTOLOGY, REPRODUCTIVE BIOLOGY, MICROTECHNIQUE AND
HISTOCHEMISTRY
(2019 Admission Onwards)**

Time: 3 Hours

Max.Marks : 75

V. Answer the following questions.

12. What are accessory cambia.
13. What is the speciality of the blade used in an Ultratome.
14. What is a stage micrometer, what is it used for.
15. Differentiate Anemophily from Entemophily.
16. Define GSI and SSI.
17. Differentiate Tension wood from Compression wood.
18. Define Pericycle, list its role in Root and Stem of dicots.
19. What are Pollen wall layers, name them.
20. What is acetolysis, why is it necessary for studying pollen grains?
21. Name the types of Cambia found in Primary stem of plants.

(10x1=10 marks)

VI. Answer the following in not more than 50 words.

22. a) Define the term "Sputter Coating", what is it used for.

OR

- b) What is the role played by Glutaraldehyde, in tissue processing for electron microscopy.

- 12.a) Differentiate squashes from smear preparations.

OR

- b) What type of microtome is preferred for taking Hardwood sections, substantiate your choice.

13. a) What is ameoboid tapetum, what is its role in Microspore development.

OR

- b) What is Pollenkitt, explain its role.

14. a) Differentiate spring wood from autumn wood.

OR

- b) Give two examples where anatomy has played a role in solving taxonomical problems.

15. a) How can you differentiate between a TLS and RLS of a stem.

OR

b) Differentiate Fascicular cambium from Interfascicular cambium.

(5 x 2=10 marks)

VII. Answer the following questions in not more than 150 words.

16. a) Define Palynology, Discuss cases where Palynological data has been helpful in solving angiosperm taxonomical problems.

OR

b) With suitable diagrams explain the mode of development of endosperm in flowering plants.

17. a) With suitable diagrams explain the type of anomalous cambial activity in *Bignonia* stem.

OR

b) With suitable diagrams explain the type of anomalous cambial activity in *Piper* stem.

18. a) Discuss merits and demerits of theories related to shoot apex organisation in plants.

OR

b) Explain the floral anatomy, of Angiosperms.

19. a) Discuss the various types of Nodal anatomy encountered in flowering plants.

OR

b) Define phyllotaxy. Describe with diagrams the types of phyllotaxy found in plants.

20. a) Define tissue dehydration, list a few of the reagents used in plant microtechnique for this purpose.

OR

b) Differentiate squashes from smears.

21. a) What are the common primary metabolites in plants, briefly explain the methods to localise any two of them.

OR

b) Explain the various steps in processing tissues for electron microscopy.

22. a) Critically discuss the terms infiltration & embedding, from the point of view of plant microtechnique.

OR

- b) Discuss the method used to measure the diameter of an Algal filament using a Micrometer.

(7x5 = 35 Marks)

VIII. Answer the following in not more than 250 words.

23. a) What are stains, how are they classified. Discuss the process of double staining with any two stains for staining an anatomical section.

OR

- b) Explain the peculiarities in wood anatomy of any three popular hardwood timber trees of Kerala.

24. a). With suitable diagrams explain the various types of Embryo sac organisation encountered in plants.

OR

- b) Write an account on the origin, structure and function of Cambium in Angiosperms.

(2 x 10 = 20 Marks)

Second Semester M.Sc. Degree Examination

Branch: BOTANY

BO 221 : TAXONOMY OF ANGIOSPERMS, ECONOMIC BOTANY AND ETHNOBOTANY

(2019 Admission Onwards)

Time: 3Hours

Max. Mark: 75

Instruction: Draw diagrams wherever specified

I. Answer the following questions:

1. What is the status of family *Ranunculaceae* in APG III Classification?
2. Write correctly *Acalypha Indica* linn
3. Where do you see “*Kaatunaikkan*” Tribes in Kerala?
4. What Latin term or abbreviation will you use for naked names?
5. Name the drug derived from *Andrographis paniculata*
6. What is the commercial source of digitalin?
7. Expand ICNCP
8. In author abbreviation what does R.Br. stands for?
9. Name the binomial of a plant with homomorphic capitulum
10. Expand KIRTADS

(10×1=10 marks)

II. Answer the following question in **not** more than **50** words

11. a) Differentiate indented and bracketed taxonomic keys.
Or
b) Give the binomial of Star anise and Allspice
12. a) Give the binomial of two ethno-medicinal plants used by *Kaani* tribes of Thiruvananthapuram district
Or
b) List out the contributions of two pioneers of Indian taxonomy
13. a) Explain double citation with an example
Or
b) Briefly discuss about *nomina conservanda*
14. a) Distinguish between lectotype and holotype
Or

- b) What is the importance of Biosystematics Study?
15. a) What are OTU's?

Or

- b) Role of BSI in taxonomy

(5×2=10 marks)

III. Answer the following questions in **not** more than **150** words

16. a) Explain the rules of priority with example.

Or

- b) Explain author citation. Give example.

17. a) Give a note on taxonomical literature.

Or

- b) Why Poaceae is considered as an advanced family

18. a) Write briefly on Molecular taxonomy

Or

- b) Give an account of Botanical gardens and importance of botanical gardens in taxonomic studies. Give the name of 5 National and international Botanic gardens

19. a) Describe briefly the economic importance of Rosaceae

Or

- b) Compare and contrast the flowers of Polygalaceae and Fabaceae

20. a) How do you prepare a herbarium? What are its uses? List out at least three well known international and national herbaria.

Or

- b) Briefly explain Chemotaxonomy

21. a) Mention the Botanical names and Economic importance of the two tuber crops.

Or

- b) What are the utilities of spices and condiments?

22. a) Discuss about the contributions of S. K. Jain and E. K. Janaki Ammal in Ethnobotany

Or

- b) Explain the methodology of collection of ethnobotanical data.

(7×5=35 marks)

IV. Answer the following question in **not** more than **250** words

23. a) Discuss briefly the major Ethnic Societies of Kerala and give the binomial and family of two traditional herbs of each.

Or

- b) Mention the binomials of any 10 medicinal plants and the families to which they belong. Bring out the medicinal importance of these plants

24. a) Compare the two phylogenetic systems classifications you have studied.

Or

- b) Critically evaluate the traditional and APG systems of classification. On the light of APG III, evaluate the status and circumscription of Apocynaceae and Asclepiadaceae.

(2×10= 20 marks)

Second Semester M.Sc. Degree Examination
Branch Botany
BO 222 : ENVIRONMENTAL BIOLOGY, FOREST BOTANY,
PHYTOGEOGRAPHY AND CONSERVATION BIOLOGY
(2019 Admission Onwards)

Time : 3 Hours

Max. marks : 75

I. Answer the following

- 1) Write two Key Stone species
- 2) Define Continental drift
- 3) What is meant by "Extinct in the wild"?
- 4) Discuss the applications of remote sensing
- 5) Write the causes of acid rain
- 6) State Ecotone with the help of an example.
- 7) Expand IBP
- 8) Explain Eutrophication
- 9) Define Carrying capacity
- 10) Discuss Gaia hypothesis

(10 X 1 = 10 Marks)

II. Answer the following questions in not more than 50 words

- 11) Explain Biological Clocks in plants.

OR

Define Phytoremediation and state its relevance.

- 12) Scope and relevance of GIS

OR

Discuss Consequence of deforestation

- 13) Differentiate between *r* and *K* selection

OR

Differentiate between social forestry and agroforestry

- 14) What are flagship species? Explain with two examples.

OR

Explain about Red data Book.

- 15) Explain Y – shaped energy flow.

OR

Explain energy flow and mineral cycling

(5 X 2 = 10 Marks)

III. Answer the following questions in not more than 150 words

- 16) Describe different energy flow models in an ecosystem

OR

Explain different aspects of Ecosystem management.

- 17) Explain the concept of Climax, taking lithosere as an example.

OR

Explain briefly genecology and Synecology

- 18) Innumerate different forest types

OR

Explain "Sustainable use of bioresources" with suitable examples.

- 19) Write on continuous distribution of Plants

OR

Explain centres of Origin of cultivated plants.

20) Describe different methods of *In-situ* conservation

OR

Describe Plant as a source of renewable energy.

21) Explain wild life preservation act in 1972.

OR

Describe any two novel agricultural technologies

22) Write on different causes of Climate Change.

OR

Explain desert ecosystems

(7 X 5 = 35 marks)

IV. Answer the following questions in not more than 250 words

23) Explain the role of NGOs in Environmental protection and conservation

OR

Discuss Phytogeographic regions of the India

24) Give an account of forest products of Kerala

OR

Give a detailed account of Global environmental problems

(2 X 10 = 20 marks)

Second Semester M. Sc. Degree Examination

Branch : Botany

BO 223 – CELL BIOLOGY, GENETICS AND EVOLUTION

(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

Instruction : Draw diagrams and illustrate with examples wherever necessary

1. Answer the following questions

- 1) What is sympatric speciation?
- 2) Explain dosage compensation.
- 3) What are SSB proteins? Give its function.
- 4) Comment on Founder effect.
- 5) What is Blooms syndrome? How it is caused?
- 6) Comment on hn RNA.
- 7) What is Lod score analysis?
- 8) What is meant by Ames test?
- 9) Name any two human diseases caused by genomic imprinting.
- 10) Give the importance of Cadherins.

(10x1= 10 marks)

II Answer the following questions in **not** more than **50** words

11) a) Differentiate functional and structural allelism.

OR

b) What is genetic drift?

12) a) Differentiate between Shine Dalgarno sequence and Kozak sequence.

OR

b) State one gene one enzyme hypothesis.

13) a) What is Synaptonemal complex? Mention its function.

OR

b) What are house keeping genes? Give one example.

14) a) Mention the role of NPCs

OR

b) What are cell cycle check points?

15) a) State the role of sn RNA in splicing.

OR

b) What is the role of Gro EL/Gro Es in *E.coli*

(5x2= 10 marks)

III Answer the following questions in **not** more than **150** words

16) a) Briefly illustrate how transformation mapping is carried out in bacteria.

OR

b) Give an account of the different mechanisms of sex determination.

17) a) Narrate the different mechanisms of reproductive isolation.

OR

b) Explain in detail how transcription is terminated in prokaryotes?

18) a) Briefly explain the structure and organisation of nucleus

OR

b) How the expression of enzymes for lactose metabolism is regulated in the presence of glucose.

19) a) Briefly explain the molecular mechanism of cell differentiation

OR

b) Mention the role of telomerase in aging.

20) a) Describe the organisation of mitochondrial genome.

OR

b) Comment on molecular evolution.

21) a) Write in detail about the any two types of DNA repair mechanisms.

OR

b) Briefly explain transcription in eukaryotes.

22) a) Isoleucyl tRNA synthetase could recognize Isoleucine and Valine as they are structurally similar. But the enzyme maintains a high accuracy in incorporating isoleucine to isoleucyl-tRNA. Explain the mechanism

OR

- b) Explain translocation process and the intermediate states of ribosome during elongation.
(7x5= 35 marks)

IV. Answer the following questions in **not** more than **250** words

- 23) a) Explain Cell cycle and write briefly on the controlling mechanisms.

OR

- b) Mention various types of numerical variations in chromosomes and add a note on its evolutionary significance.

- 24) a) Explain in detail Hardy Weinberg law and the factors that influence it.

OR

- b) Comment on the mechanism of DNA replication in prokaryotes. Mention the role of various enzymes involved in the process.
(2x10 = 20 marks)

Third Semester M. Sc. Degree Examination

Branch : Botany

BO 231 – PLANT BREEDING, HORTICULTURE AND BIOSTATISTICS

(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

I. Answer the following questions

1. What is Super rice?
2. What is the significance of ANOVA?
3. Expand IRRI
4. What is F test?
5. Distinguish between A lines and R lines
6. What is Gamma garden?
7. Name the natural fruit ripening hormone
8. What do you mean by vertical farming ?
9. What is vermi wash ?
10. Define inbreeding

(10x1=10 marks)

II . Answer the following questions in not more than 50 words:-

- 11a. What is the significance of Multiline selection

OR

- b. Explain self incompatibility and its applications in crop improvement

12a. Distinguish between lawns and landscape:

OR

b. Give a brief account of biofertilizers

13 a. Distinguish between auto and allopolyploids

OR

b. What do you mean by recurrent irradiation ?

14a. What is PBR? How it can be achieved?

OR

b. Give an account of major Centres of origin

15a. Define Ideotype? Name any two ideotypes of wheat.

b. Differentiate mean and median with examples

(5x2=10 marks)

III. Answer the following questions in not more than 150 words:-

16a. What is pureline selection? Explain the procedure and its applications

OR

b. Briefly explain the major problems for the production of distant hybrids

17a. Write a note on Bonsai

OR

b. Give an account on Commercial floriculture

18a. Compare and contrast correlation and regression

OR

b. Write an account on Chi-square test and its applications

19a .Give a brief account of Seed certification procedure

OR

b: What is Heterosis? Explain its genetic basis

20 a. Explain the role of chromosome manipulations in crop improvement programme
OR

b. Give a brief account of the activities of NBPGR

21a. Give an account of experimental designs

OR

b. What is Probability? Explain the theorems of probability.

22a. Explain the genetic basis of resistance breeding

OR

b. Explain the significances of back cross breeding

(7x5=35 marks)

1V. Answer the following questions in not more than 250 words

23. a. Explain the methods of Conservation and utilization of germplasm in crop improvement programs

OR

b. Give an account of Mutation Breeding and its significances in crop improvement program

24. What are the measures of dispersion? Explain various measures of dispersion and their merits and demerits.

OR

b. Give an account of plant growing structures

(2x10=20 marks)

Model Question paper
Third semester M.Sc. Degree Examination
BRANCH : BOTANY
Paper BO 232: BIOCHEMISTRY, PLANT PHYSIOLOGY AND RESEARCH
METHODOLOGY
(2019 Admission onwards)

Time : 3 Hours

Maximum Marks: 75

I. Answer the following questions.

1. Explain the role of phytoalexins in defense mechanism of plants.
2. How membrane lipids of organelles different?
3. What are Aquaporins?
4. What are predatory journals?
5. What is Peer review?
6. What are Zeitgebers?
7. How the activation of Rubisco is is achieved?
8. Differentiate between climacteric and nonclimacteric fruits.
9. Explain the concept of quantum yield.
10. Name an imino acid.

(10 X 1 = 10 marks)

II. Answer the following questions in not more than 50 words.

- 11 a. Describe the formulation of hypothesis in research.

OR

- b. Write the significance of review of literature.

- 12 a. Give a short account on abzymes.

OR

- b. Describe the catabolism of purine nucleotides.
- 13 a. Describe a method for the purification of proteins.
- OR
- b. Explain the zwitterionic nature of aminoacids.
- 14 a. Discuss the developmental and physiological effects of abscissic acid.
- OR
- b. Discuss the physiology behind vernalisation.
- 15 a. How energy dependent process of phloem loading takes place?
- OR
- b. Discuss the biochemical signaling involved in flowering. **(5 X 2 = 10 marks)**

III. Answer the following questions in not more than 150 words.

- 16 a). Briefly describe the major parts of Thesis. Discuss the significance of each.
- OR
- b). What are the significances of citation styles in research publications? Enlist the major citation styles.
- 17 a). Explain the catabolism of triacylglycerols during seed germination.
- OR
- b). Elucidate the pentose phosphate pathway.
- 18 a). Correlate photoperiodism and phytochrome action in flowering plants.
- OR
- b). Give an account on symbiotic and nonsymbiotic nitrogen fixation.
- 19 a). Describe the salt tolerance in plants.
- OR
- b). Describe the structure and function of Photosystem II
- 20 a). Derive the Henderson – Hasselbalch equation.
- OR
- b). Comment on Ramachandran plot.
- 21 a). Describe the structure and function of fatty acids.

OR

b). What is an allosteric enzyme? Explain the regulatory activity and kinetic properties.

22 a). Elaborate on water oxidizing clock with appropriate sketches.

OR

b). Give an account on chemiosmotic theory and oxidative phosphorylation.

(7 X 5 = 35 marks)

IV. Answer the following questions in **not** more than **250** words.

23 a). Compare C_3 and C_4 CO_2 fixation process in plants in terms of ecological advantage and energetics.

OR

b). What are the various physiological adaptations of the plants which enable plants to tolerate drought, cold and salinity stress.

24 a). Elaborate the different aspects to be taken care while designing a research programme.

OR

b). Give the classification of proteins based on structure, function and localization sites.

(2 X 10 = 20 marks)

Third Semester M.Sc. Degree Examination

Branch: BOTANY

**BO 233: MOLECULAR BIOLOGY, IMMUNOLOGY & PLANT BIOTECHNOLOGY
(2019 Admission Onwards)**

Time: 3Hours

Max. Mark: 75

Illustrate your answers wherever necessary

I Answer the following questions

1. Define totipotency
2. What are Phagemids
3. What do you mean by NGS
4. Distinguish between epitope and paratope
5. What are fusion proteins?
6. What is Golden rice ?
7. What is the use of CaMV in Biotechnology?
8. Expand GMF
9. What is RIA?
10. What are Tn elements?

(10 × 1=10 marks)

II. Answer the following questions in not more than 50 words

11. (a).What is cell line selection?

OR

(b) Write a note on artificial seeds

12. (a) Differentiate AFLP and RFLP

OR

(b) What is the role of molecular chaperons?

13. (a) Write an account on restriction endonucleases

OR

(b) Discuss telomere and telomerase

14. (a) Write about Sandwich ELISA

OR

(b) How does TB evade immune surveillance?

15. (a) Write the significance of meristem culture

OR

(b) Write a short account on Biopiracy

(5 × 2=10 marks)

III. Answer the following questions in not more than 150 words

16 (a) Describe the methods employed in plant secondary metabolite production in bioreactors. Write its advantages and significance

OR

(b) Briefly explain somatic hybridization and its application on plant breeding

17 (a) Give a brief description on blotting techniques

OR

(b) Write an explanatory note on Cloning vectors

18 (a) Explain briefly about molecular markers

OR

(b) Give a brief description on gene sequencing

19 (a) Explain the structure and functions of IgG, IgM and IgE

OR

(b) Explain the complimentary systems and its significance

20 (a) Differentiate between genomic and cDNA libraries

OR

(b) Explain gene transfer methods in plants

21. (a) Discuss how haploids are produced by plant tissue culture technique?

OR

(b) Explain the *in vitro* strategies for the conservation of plant germplasm

22. (a) Describe in detail the importance of humoral and cell mediated immune response

OR

(b) Explain the production of monoclonal antibodies

(7 × 5 =35 marks)

IV. Answer the following questions in not more than 250 words.

23. (a) Explain plant tissue culture and its applications

OR

(b) Write an essay on gene transfer methods in plants

24. (a) Explain PCR. Add an account on the applications of PCR

OR

(b) Write an essay on the application of plant biotechnology for the production of transgenic plants for improved traits citing suitable examples

(2 × 10=20 marks)

Fourth Semester M. Sc. Degree Examination

Branch : Botany

BO 241 – BIOINFORMATICS AND BIOPHYSICS

(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

Instruction : Draw diagrams and illustrate with examples wherever necessary

1. Answer the following questions

- 1) Mention the role of mercaptoethanol in SDS PAGE
- 2). Comment on first molecular database.
- 3) What is genome annotation?
- 4) What is Cerenkov radiation?
- 5) Give the importance of NCBI.
- 6) What is Rf value? How Rf value is calculated?
- 7) Comment on Neutral Theory.
- 8) Name any two nucleotide databases.
- 9) What is meant by resolving power of a microscope? How is it calculated?
- 10) What is CLADE?

(10x1= 10 marks)

II Answer the following questions in **not** more than **50** words

11) a) Give the applications of FTIR spectroscopy

OR

b) Explain Vander Vaal's forces.

12) a) State Braggs law.

OR

b) Comment on density gradient centrifugation.

13) a) Differentiate between global and local alignment.

OR

b). Write short note on pharmacogenomics.

14) a) What is the significance of PDB?

OR

b) Distinguish between Orthologous and Paralogous condition.

15) a) What are the different types of databases based on the data storage pattern in computer.

OR

b) Write note on personalized medicine.

(5x2= 10 marks)

III Answer the following questions in **not** more than **150** words

16) a) Comment on the principle and application of gel permeation chromatography.

OR

b) Give the principle and application of X-ray diffraction.

17) a) Explain the technique and applications of phase contrast microscopy.

OR

b) Give the principle and applications of NMR spectroscopy.

18) a) Describe the procedure and applications of various types of ELISA techniques.

OR

b) Give an account of the different fixation and staining techniques of electron microscopy.

19) a) Give a brief account on biological macromolecule sequence databases.

OR

b) Comment on multiple sequence alignment. What are the major tools used in MSA?

20) a) Give the basics of Cho and Fasman method.

OR

b) Comment on the basics and significance of Homology model.

21) a) Write a brief account on computer aided drug design

OR

b) Comment on the algorithm of BLAST.

22) a) With the help of two example briefly describe Scoring Matrices.

OR

b) Give an algorithmic description on UPGMA and NJ methods in Bioinformatics.

(7x5= 35 marks)

IV. Answer the following questions in **not** more than **250** words

23) a). Give the importance of electrophoresis in biological research. Explain the various types of electrophoretic methods.

OR

- b). Give the principle and applications of tracer techniques in biology.
- 24) a) Give an account of the major tools used in bioinformatics.

OR

- b) Write an essay on major steps involved in phylogenetic tree creation. Write two examples of application of Molecular Phylogeny. **(2x10= 20 marks)**

Fourth Semester M. Sc. Degree Examination
Branch : Botany
BO 242 a – SPECIAL PAPER II ELECTIVE
BIOTECHNOLOGY
(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

Instruction : Draw diagrams and illustrate with examples wherever necessary

1. Answer the following questions

- 1) Give the importance of YAC.
- 2). Differentiate type II and type III restriction endonuclease.
- 3) What is geographic indication? Give one example.
- 4) Comment on CRY protein.
- 5) What is STMS?
- 6) What is Roundup?
- 7) What is terminator seed?
- 8) Comment on humulin.
- 9) Give the importance of PEG.
- 10) What are probiotics?

(10x1= 10 marks)

II Answer the following questions in **not** more than **50** words

11) a) What is fed batch culture?

OR

b) Differentiate hybrids and cybrids.

12) a) What are dominant and co dominant markers? Give one example for each.

OR

b) What is DMSO? Give its importance in cryopreservation.

13) a) Distinguish somaclonal and gametoclonal variation.

OR

b). What is dot blot hybridization?

14) a) What are cell lines?

OR

b) Give the importance of Laminar air flow chamber.

15) a) What is meant by homopolymer tailing?

OR

b) What are synthetic seeds?

(5x2=10 marks)

III Answer the following questions in **not** more than **150** words

16) a) Write an account of the different types of direct gene transfer methods.

OR

b) Differentiate Southern and Western blotting techniques.

17) a) How strain improvement could be achieved for the enhanced production of microbial products?

OR

b) Give notes on the different vectors used in genetic engineering.

18) a) Differentiate cDNA and genomic DNA library.

OR

b) Elaborate on the technique of PCR. Give its major applications.

19) a) Give an account of radioactive and non-radioactive labelling techniques.

OR

b) Comment on the importance of transposons in genetic engineering.

20) a) Briefly explain the production of monoclonal antibodies hybridoma technology.

OR

b) Comment on the social and ethical issues of GMOs.

21) a) What is AFLP? State the procedure and applications of the technique.

OR

b) Comment on the different methods of site directed mutagenesis giving the advantages and disadvantages.

22) a) Write short account on the technique and applications of protoplast culture.

OR

b) Give in detail the technology for the production of flavr savr tomato.

(7x5=35 marks)

IV. Answer the following questions in **not** more than **250** words

23) a). Briefly describe the structure of a bioreactor. What are the methods used in downstream processing?

OR

b). What are the general requirements of plant tissue culture medium? Briefly explain the methodology to be followed in medium preparation.

24. a. Write a short note on the impact of biotechnology in agriculture.

OR

b) Explain suspension culture stating the kinetics of growth and the importance of different elicitation methods.

(2x10=20 marks)