UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No. .....

Subject: Botany **Paper: VIII (Plant Anatomy and Taxonomy of Angiosperms)** **Time: 3 Hrs.** **Marks: 60**

NOTE: Attempt any FIVE questions from the following. Each question carry equal marks. Support your answers with the required figures.

1- (a) Define plant systematics. Explain natural system of Classification.

(b) Explain the Objectives/Aims of plant systematics.

2- (a) What is meristem? Describe organization of cells in root apical meristem.

(b) What are the characteristics of meristematic tissues?

3- (a) Give the development of a typical Dicot embryo in an Angiosperm.

(b) What is secondary growth? Briefly describe it in Dicot stem.

4- (a) Describe the various types of simple tissues and their functions.

(b) Describe the Sub microscopic structures of cell wall.

P.T.O.

5- (a) What is Xylem? Describe the different components and types of Xylem.

(b) What is Parenchyma? Describe its structure, types and functions.

6- (a) Define species. Also differentiate b/w typological and biological species concept.

(b) What is the role of Embryology and Paleobotany in taxonomic evidences?

7- Write brief notes on the followings.

(a) Epidermal Appendages

(b) Periderm

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M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Botany **Paper: IX (Plant Physiology)**

Roll No. .....

Time: 3 Hrs. **Marks: 60**

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.1 A. Differentiates between photosystem I and photosystem II. How they co-ordinate in harvesting light? (6)

B. C3 plants are expected to benefit more than C4 or CAM plants from elevated CO2. Why is it so? (6)

Q.2 A. Why gene regulation among eukaryotes is so complex? Justify your opinion with suitable examples. (6)

B. How signaling in two components system and in many component system regulate response? Justify your opinion with suitable example? (6)

Q.3 A. Differentiate between macronutrients and micronutrients? (6)

B. Differentiate between essential and non-essential elements. Discuss the deficiency symptoms of Potassium and phosphorus in plants. (6)

Q.4 A. Describe the process of phloem loading. (6)

B. Write a note on various materials translocated in phloem (6)

Q.5 A. Write a note on Krebs cycle. (6)

P.T.O.

B. Define the respiratory substrate. How respiratory quotient predict the nature of respiratory substrate. (6)

Q.6

A. Define water potential. Discuss its basic components? (6)
B. Which are usually wider, tracheids or vessels? How does increased xylem diameter affect flow and sensitivity to cavitation? (6)

Q.7

A. Using cereal endosperm as an example, discuss the mechanism of the mobilization of seed storage reserves. (6)
B. Discuss the starch-statolith hypothesis in relation to gravitropism in roots. (6)

Q.8

C. Discuss the floral organ identity genes. Illustrate the ABC model as well. (6)
D. Discuss the role of photoperiodism in flowering. (6)

Q.9

A. Describe the mechanism of stomatal movement? (6)
B. Discuss the different factors that affect the stomatal movement. (6)

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M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Botany **Paper: X (Molecular Genetics)**

Roll No. .....

Time: 3 Hrs. **Marks: 60**

NOTE: Attempt any FIVE questions. All questions carry equal marks.

1. What is site specific recombination? How recombination and rearrangement of chromosomes take place? Explain. **(12 marks)**
2. Describe recombination of genetic material in bacteria. How one can use conjugation, transformation and transduction to map bacterial chromosome? Do describe the merits and demerits of all three processes. Describe conjugation in detail. **(12 marks)**
3. What are insertion sequences (IS)? Describe their role in creating variation and changes in chromosomes and their role in conservational genetics. **(12 marks)**
4. What are operons? Explain the negative and positive control of lac operons? How they control the transcription and gene regulation in eukaryotes? **(6+6= 12 marks)**
5. Describe in detail the mechanisms/controls in transposition of various transposable genetic elements. Also describe in detail the Barbara and Rhodes experiment they performed on maize plant **(6+6=12 marks)**

P.T.O.

6. (a) What are mutagens? How many types of mutagens / mutations are there? Describe somatic versus germinal mutations. **(8 marks)**

   (b) What is the evolutionary significance of mutation? **(4 marks)**

7. (a) Why we called DNA a genetic material? How DNA replications take place in eukaryotes? How many different types of proteins are involved? **(8 marks)**
   (b). Why DNA replication is always from 5'-3' end. Explain.**(4marks)**

8. Define/ differentiate between following terms clearly **(2x6= 12 marks)**

a. Restriction Endonucleases II / Restriction endonuclease III
b. RNA polymerase I / RNA polymerase II
c. Point mutation/ deletion mutation
d. Wobble Hypothesis/ Degeneracy
e. Three point linkage/ two point linkage
f. Multiple alleles/ lethal alleles

9. Discuss linkage in detail with emphasis on recombination and linkage of gene on X chromosome. **(12 marks)**

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Roll No. .....

Subject: Botany **Paper: XI (Environmental Biology)** **Time: 3 Hrs.** **Marks: 60**

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.1. (a) What are rangelands and explained their types? (6)
(b) What are major problems of environment regarding to conservation strategies and management? (6)

Q.2. (a) Write a note on Noise pollution? (6)
(b) How radiation pollution effect on environment? (6)

Q.3. (a) What are hydroelectric dams? Discuss their role in environment? (6)
(b) What are main types of erosion? (6)

Q.4. (a) What are effects of organic and inorganic pollutants on plants? (6)
(b) Write a note on Acid rain? (6)

P.T.O.

Q.5. (a) Write a note on deforestation and desertification? (6)
(b) Write a note on formation of ozone layer? (6)

Q.6. (a) What is waterlogged? How waterlogging effect vegetation? (6)
(b) What are Wetlands? How they can be protected? (6)

Q.7. a) What is conservation strategy? Highlights its role in development of environment?(6)
b) Write a note on hydroelectric dams? (6)

Q.8. Write a note on

(a) Heavy Metal Pollution (6)
(b) Global Warming (6)

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M.A./M.Sc. Part – II Annual Exam – 2019

Roll No. .....

Subject: Botany (Special Paper)
Paper: Opt. I (Plant Tissue Culture and its Agricultural Applications)

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.1. What is Micro-propagation? How is it carried out? Explain its various stages with the help of suitable flow-diagram/figure. (15)

Q.2. (a) Describe the process of Callus formation. How is it maintained further? (8)

(b) Define Organogenesis. What potential benefits this phenomenon may offer? (7)

Q.3. Differentiate between the following terms:

(a) Apical Meristem and Shoot Apex (5)

(b) Pollen and Anther Cultures (5)

(c) In vitro and In vivo studies (5)

Q.4. (a) What is Cellular Totipotency? What its apparent significance? (8)

(b) What is Somatic Embryogenesis? Briefly explain the various steps involved in the formation of somatic embryos. (7)

Q.5. Write a short notes on the following:

a. Applications of Plant Tissue Culture
b. Role of Auxins in Plant Tissue Culture
c. Aseptic Techniques

Q.6. (a) What is the role of Auxins and Cytokinins in Plant Tissue Culture? What role GA, might play? (8)

(b) How is Somatic Embryogenesis different from Organogenesis? (7)

Q.7. Write a detailed account of isolation and purification of Plant Protoplasts. (15)

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M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Botany (Special Paper) Paper: Opt.VII (Advance Plant Anatomy)

Roll No. .....

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.1 (a) Discus the process of formation of cell wall also describes its properties in cell? (8)

(b) Define leaf also write a detail note on histology of gymnospermic leaf? (7)

Q.2 (a) Write a note on the anomalous secondary growth in plants? (8)

(b) Explain the morphology of periderm and pheloderm? (7)

Q.3 (a) Write a detail note on the formation of intercellular spaces? (8)

(b) Write note on morphological specialization of xylem vessels and trachery elements? (7)

Q.4 (a) Define apical meritsem, write down its types and properties (8)

(b) Discuss the role of secretary tissues in plants? (7)

Q.5 (a) How periderm helpful to evolve woody characteristics in plants? (8)

(b) Write down the comprehensive note on epidermis with special reference to stomata? (7)

P.T.O.

Q.6 (a) Write a note on sieve elements and sieve tube members in phelom? (7)

(b) Discuss the major types and modification of stem (8)

Q.7 (a) Define root also differentiates between root of monocot and dicot plants? (8)

(b) Write a note on economic aspects of applied plant anatomy? (7)

Q.8 (a) Write a note on root-shoot transition zone? (8)

(b) Discuss venation pattern of leaf in detail with the help of diagram? (7)

Q.9 (a) Describe the morphology of stem also elaborates the concept of stele? (8)

(b) Explain the role of phelome in evolution of conducting tissues? (7)