

Booklet Serial No.

Signature Invigilator

Maulana Azad National Urdu University
PhD (Botany)
Entrance Test May 2026
Question Paper cum Answer Script

Hall Ticket No.

OMR Serial No.

Time: 2hrs**Maximum Marks: 70****INSTRUCTIONS FOR CANDIDATES**

1. Candidate should write their Hall Ticket number and OMR number on the space provided above. Candidate should not write their Hall Ticket and OMR number at any other place.
2. This question booklet contains (24) pages. The Candidate should check the booklet before taking the Test. In case of any discrepancy, a new booklet may be provided by the Invigilator.
3. The question booklet consists of Part A and Part B. Part A contains 50 multiple-choice questions, each with four options. The candidate must select the correct answer and mark the corresponding circle on the OMR sheet using a blue or black ballpoint pen. Each question carries one mark. No marks will be awarded if the correct answer is not properly marked against the corresponding question number in the OMR sheet. Further, if more than one option is marked for any question, no marks will be awarded for that question.
4. Part B consists of four descriptive questions, each carrying 5 marks. The answers must be written only in the 8-page answer booklet provided. No additional answer booklet will be issued.
5. There are no Negative marks.
6. At the end of Entrance Test, candidates are allowed to take their question booklet and handover the OMR Sheet and answer booklet to the Invigilator.

Part A**Section 1 – Research Methodology**

1. In a plant growth experiment, a researcher wants to control for the spatial heterogeneity of soil fertility across a field. Which experimental design would be most appropriate to minimize experimental error?
 - (A) Randomized Block Design (RBD)
 - (B) Systemic Sampling
 - (C) Complete Randomized Design (CRD)
 - (D) Simple Random Sampling
2. Which type of hypothesis assumes that there is no significant difference between the groups being studied?
 - (A) Directional hypothesis
 - (B) Null hypothesis
 - (C) Complex hypothesis
 - (D) Alternative hypothesis
3. In phylogenetic studies using molecular data, which method utilizes a 'substitution model' to estimate the most likely evolutionary tree given the observed DNA sequences?
 - (A) Maximum Parsimony
 - (B) UPGMA
 - (C) Neighbor-joining
 - (D) Maximum-likelihood
4. Which of the following is the first step in starting a botanical research project?
 - (A) Statistical Analysis
 - (B) Data Collection
 - (C) Writing the research report
 - (D) Identification of a research problem
5. A researcher wants to test the effect of different light wavelengths on seed germination. In this experiment, what is the 'light wavelength'?
 - (A) Extraneous variable
 - (B) Dependent variable
 - (C) Independent variable
 - (D) Control group
6. What is the primary purpose of a 'Control' in a botanical experiment?
 - (A) To minimize the number of sample needed
 - (B) To provide the standard for comparison
 - (C) To increase the speed of plant growth
 - (D) To reduce the cost of research

7. If a researcher measures the height of 100 pea plants, what kind of data are they collecting?
- (A) Nominal data (B) Ordinal data
(C) Qualitative data (D) Quantitative data
8. Which section of a research paper provides a summary of the entire study, including the objectives, methods, and results?
- (A) Abstract (B) Bibliography
(C) Conclusion (D) Discussion
9. Which of these is a measure of the central tendency of a data set?
- (A) Standard deviation (B) Standard error
(C) Mean (D) Variation
10. When a researcher uses someone else's ideas or data without giving proper credit, it is called:
- (A) Peer review (B) Plagiarism
(C) Citation (D) Replication
11. What is the primary goal of the 'Materials and Methods' section in a botanical research paper?
- (A) To argue why research is important
(B) To list the name of research assistant
(C) To present the final conclusion
(D) To allow other researchers to replicate the study
12. Which of the following is considered a primary source of scientific information in botany?
- (A) An original research article in a peer reviewed journal
(B) A newspaper article about a new park opening
(C) An encyclopedia entry about photosynthesis
(D) A text book on plant physiology

13. In a study measuring how fertilizer concentration affects the number of leaves on a plant, what is the dependent variable?
- (A) Fertilizer concentration (B) The amount of water given
(C) The number of leaves (D) The type of soil used
14. What is the most common method for preserving plant specimens for long-term study in a herbarium?
- (A) Pressing and drying
(B) Freezing them in liquid nitrogen
(C) Keeping them in a jar of water
(D) Storing them in plastic bags at room temperature
15. Which statistical value represents the middle point of a data set when the numbers are arranged in order?
- (A) Mean (B) Median
(C) Mode (D) Variation
16. A researcher selects every 10th plant along a trail for a survey. This is an example of:
- (A) Convenience sampling (B) Simple random sampling
(C) Stratified sampling (D) Systematic sampling
17. Why is it important to use 'Replication' in botanical experiments?
- (A) To ensure only one plant is tested at a time
(B) To save money on seeds
(C) To make the experiment take longer
(D) To account for natural variation between individual plants
18. Which of the following is a 'Qualitative' observation of a flower?
- (A) The flower is 12 cm wide (B) The flower weighs 2 grams
(C) The flower is bright red (D) The flower has 5 petals
19. What is the main purpose of a 'Peer Review' before a research paper is published?
- (A) To translate the paper into other languages
(B) To ensure the research is valid and follows scientific standards
(C) To advertise the research to the public
(D) To check for spelling errors only

20. Which graph type is best for showing the relationship between two continuous variables, such as soil pH and plant height?
- (A) Flowchart (B) Scatter plot
(C) Pie chart (D) Bar graph
21. In botanical fieldwork, what is a 'Quadrat' used for?
- (A) Sampling plant populations in a specific area
(B) Identifying the genus of a flower
(C) Measuring the height of tall trees
(D) Grinding plant tissues for DNA extraction
22. What is the primary reason for keeping a detailed field notebook in botany?
- (A) To write personal stories about the trip
(B) To practice handwriting
(C) To draw pretty pictures for a museum
(D) To record context like location, date, and weather that might affect data
23. Which of the following is a type of secondary data in botany?
- (A) Using climate records from a national weather database
(B) Performing a laboratory assay on leaf extracts
(C) Recording flower colors in a meadow
(D) Measuring annual rings of a tree in a forest
24. If you are studying the medicinal properties of a plant, what is the best reason for identifying it to the species level?
- (A) To avoid having to take photos of the plant
(B) To make the name sound more professional
(C) Because chemical compounds can vary greatly between closely related species
(D) To follow the rules of the local library
25. What is 'Bias' in research?
- (A) A tool used for measuring leaf surface area
(B) A type of plant disease
(C) The total number of plants in a forest
(D) A prejudice or error that influences results in a particular direction

Section 2 – Botany

26. Which of the following is NOT a component of the plant cell wall?
- (A) Cellulose (B) Chitin
(C) Pectin (D) Hemicellulose
27. Which of the following is the site of ribosome synthesis in plant cells?
- (A) Nucleus (B) Cytoplasm
(C) Endoplasmic reticulum (D) Golgi apparatus
28. During mitosis, sister chromatids separate at which phase?
- (A) Prophase (B) Metaphase
(C) Anaphase (D) Telophase
29. What is the primary function of stomata in plants?
- (A) Water absorption (B) Gas exchange
(C) Growth regulation (D) Nutrient transport
30. What is the role of the Casparian strip in plant roots?
- (A) To prevent water and nutrient uptake
(B) To regulate water and nutrient uptake
(C) To facilitate lateral root development
(D) To protect against soil pathogens
31. Which of the following is NOT a macronutrient required by plants?
- (A) Phosphorus (B) Nitrogen
(C) Potassium (D) Iron
32. Which of the following is a type of simple fruit?
- (A) Aggregate fruit (B) Multiple fruit
(C) Berry (D) Pome
33. Which of the following is a key enzyme involved in carbon fixation during photosynthesis?
- (A) RuBisCo (B) PEP carboxylase
(C) ATP synthase (D) Nitrogenase

34. Which of the following fungal genera is commonly used in biocontrol of plant-parasitic nematodes?
- (A) *Trichoderma* (B) *Fusarium*
(C) *Verticillium* (D) *Myrothecium*
35. Which of the following is NOT a symptom of nematode infestation in plants?
- (A) Root knots or galls
(B) Reduced nutrient and water uptake
(C) Increased fruit size and yield
(D) Stunting and yellowing of leaves
36. Which of the following is a type of nematode that feeds on the outside of plant roots?
- (A) Endoparasitic nematode (B) Ectoparasitic nematode
(C) Migratory nematode (D) Sedentary nematode
37. Which of the following is a technique used to identify nematodes in soil samples?
- (A) Baermann funnel technique (B) PCR-based methods
(C) Microscopy (D) All of the above
38. Pathogenicity of bacteria is controlled by.
- (A) Type-III (B) Type-II
(C) Type-I (D) Type-IV
39. F-factor of bacterium is made up of.
- (A) DNA only (B) DNA and Protein
(C) RNA and Protein (D) DNA and RNA
40. Fungi imperfect includes in
- (A) Deuteromycotina (B) Basidiomycotina
(C) Ascomycotina (D) Oomycotina

41. Which of the following protein is associated with Prion disease?
(A) PrPc (B) PrP
(C) PrPsc (D) Interferon
42. What is the protein-nucleic acid ratio of TMV?
(A) 80:10 (B) 70:7.5
(C) 94.4:5.6 (D) 90:6.0
43. Systemic acquire resistance (SAR) in plant is triggered by.
(A) Localized infection with a pathogen
(B) Application of systemic fungicides
(C) High temperature
(D) Water stress
44. Hrp genes are discovered by
(A) Albersheim (B) Lindgren & Peet
(C) Morris (D) Staskawicz
45. Father of Indian Mycology
(A) E.J.Butler (B) K.C.Mehta
(C) Mundkur (D) R.S.Singh
46. Amphivasal vascular bundles are found in
(A) *Dracaena* (B) *Cucurbita*
(C) *Bignonia* (D) *Fern*
47. The protein part of an enzyme is
(A) Prosthetic group (B) Holoenzyme
(C) Zymogen (D) Apoenzyme
48. In PS-I reduced ferredoxin donates electrons to
(A) NADP (B) NADPH
(C) NAD (D) NADPH₂

49. $\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$ is the structure of
- (A) Oleic acid (B) Palmitoleic acid
(C) Stearic acid (D) Palmitic acid
50. The total amount of DNA present in a haploid genome of an organism is called as
- (A) C-Value (B) P-Value
(C) S-Value (D) T-Value

Part B (Descriptive Questions)

Answer all four questions

20 Marks

Research Methodology

1. Explain the different methods of data collection.
2. Write a note on
 - a. Impact Factor
 - b. Paper Citation Index

Botany

3. Briefly define Types of Classification.
4. Write the classification of Bentham & Hooker.

Rough Work

Rough Work

Rough Work