

Roll No.

Question Booklet Number

O. M. R. Serial No.

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Question Booklet Number

M. Sc. (Second Semester)
(NEP) EXAMINATION, 2025-26

BOTANY

(Taxonomy of Angiosperms And Biosystematics)

Paper Code							
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Questions Booklet
Series

D

Time : 1:30 Hours]

[Maximum Marks : 75

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page)

(शेष निर्देश अन्तिम पृष्ठ पर)

(Only for Rough Work)

1. In Brassicaceae, pollen grains are typically :
 - (A) Monosulcate
 - (B) Tricolpate
 - (C) Monoporate
 - (D) Winged
2. Fossil pollen studies are useful in :
 - (A) Cytotaxonomy
 - (B) Paleobotany
 - (C) Chemotaxonomy
 - (D) Ecology only
3. Which of the following plants from the Rubiaceae family is used for the production of quinine, a treatment for malaria?
 - (A) *Coffea arabica*
 - (B) *Cinchona officinalis*
 - (C) *Gardenia jasminoides*
 - (D) *Morinda citrifolia*
4. The evolutionary advancement from monosulcate to tricolpate pollen indicates :
 - (A) Reduction
 - (B) Primitive condition
 - (C) Advancement in angiosperms
 - (D) Degeneration
5. Palynological evidence strongly supports the separation of :
 - (A) Gymnosperms and Angiosperms
 - (B) Monocots and Dicots
 - (C) Algae and Fungi
 - (D) Bryophytes and Pteridophytes
6. Pollen characters are considered taxonomically valuable because they are :
 - (A) Highly variable
 - (B) Environmentally unstable
 - (C) Genetically controlled and stable
 - (D) Visible to naked eye
7. Palynotaxonomy is useful in determining :
 - (A) Economic value
 - (B) Evolutionary relationships
 - (C) Soil fertility
 - (D) Water absorption
8. Tricolpate pollen grains are characteristic of :
 - (A) Monocots
 - (B) Gymnosperms
 - (C) Dicots (Eudicots)
 - (D) Bryophytes
9. The resistant material present in exine is :
 - (A) Lignin
 - (B) Cellulose
 - (C) Sporopollenin
 - (D) Suberin

10. The outer wall of a pollen grain is called :
- (A) Intine
 - (B) Exine
 - (C) Cortex
 - (D) Endodermis
11. The process of drying plant specimens for herbarium preparation is called :
- (A) Fixation
 - (B) Mounting
 - (C) Pressing
 - (D) Embedding
12. Palynotaxonomy is the study of :
- (A) Leaves
 - (B) Wood anatomy
 - (C) Pollen morphology for classification
 - (D) Fossils only
13. Betalains are most significant at the taxonomic level of :
- (A) Kingdom
 - (B) Division
 - (C) Order and Family
 - (D) Species only
14. Betalains are mainly found in the order :
- (A) Rosales
 - (B) Caryophyllales
 - (C) Asterales
 - (D) Poales
15. Essential oils are important taxonomic characters in :
- (A) Lamiaceae
 - (B) Poaceae
 - (C) Fabaceae
 - (D) Orchidaceae
16. Cyanogenic glycosides are found in :
- (A) Fabaceae
 - (B) Brassicaceae
 - (C) Asteraceae
 - (D) Orchidaceae
17. Presence of glucosinolates is a characteristic of :
- (A) Solanaceae
 - (B) Brassicaceae
 - (C) Poaceae
 - (D) Lamiaceae

18. Which technique is widely used for separation of plant chemicals?
- (A) Hybridization
 - (B) Chromatography
 - (C) Karyotyping
 - (D) Fossil dating
19. Proteins and amino acid sequences used in taxonomy fall under :
- (A) Serotaxonomy
 - (B) Cytotaxonomy
 - (C) Numerical taxonomy
 - (D) Artificial classification
20. Chemotaxonomy mainly deals with :
- (A) Primary metabolites only
 - (B) Secondary metabolites
 - (C) DNA sequences only
 - (D) Chromosome numbers
21. Cluster analysis in numerical taxonomy is mainly :
- (A) Subjective
 - (B) Statistical
 - (C) Fossil-based
 - (D) Artificial
22. OTU stands for :
- (A) Operational Taxonomic Unit
 - (B) Original Taxonomic Unit
 - (C) Organized Taxonomic Unit
 - (D) Observed Taxonomic Utility
23. In numerical taxonomy, characters are usually coded as :
- (A) A, B, C
 - (B) + and -
 - (C) 0 and 1
 - (D) Roman numerals
24. The principle of numerical taxonomy includes :
- (A) Maximum use of characters
 - (B) Few important characters
 - (C) Only reproductive characters
 - (D) Only floral characters
25. The graphical representation of relationships in numerical taxonomy is called :
- (A) Cladogram
 - (B) Dendrogram
 - (C) Herbarium sheet
 - (D) Phylogram

26. The basic unit of study in numerical taxonomy is :
- (A) Character
 - (B) Taxon
 - (C) Operational Taxonomic Unit (OTU)
 - (D) Species
27. Numerical taxonomy is based on :
- (A) Evolutionary relationships
 - (B) Overall similarity of characters
 - (C) Fossil evidence
 - (D) Economic importance
28. Numerical taxonomy was developed by :
- (A) Linnaeus
 - (B) Bentham & Hooker
 - (C) Sneath and Sokal
 - (D) Takhtajan
29. Numerical taxonomy is also known as :
- (A) Cladistics
 - (B) Phenetics
 - (C) Cytotaxonomy
 - (D) Biosystematics
30. The study of variation within and between populations is important in :
- (A) Artificial system
 - (B) Classical taxonomy
 - (C) Biosystematics
 - (D) Economic botany
31. Biosystematics mainly studies :
- (A) Morphological characters only
 - (B) Evolutionary and genetic relationships
 - (C) Economic uses of plants
 - (D) Fossil plants only
32. Biosystematics is also known as :
- (A) Classical taxonomy
 - (B) Experimental taxonomy
 - (C) Artificial classification
 - (D) Numerical taxonomy
33. A is the original or base name of a taxon that is later transferred to a new genus or rank, with the original epithet (species name) being retained.
- (A) Basionym
 - (B) Homonym
 - (C) Tautonym
 - (D) Synonym

34. Two or more different names for the same taxon are called :
- (A) Homonyms
 - (B) Synonyms
 - (C) Antonyms
 - (D) Autonyms
35. Which of the following "suffixes" used for units of classification in plants indicate a taxonomic category of "family" ?
- (A) -ale
 - (B) -onae
 - (C) -aceae
 - (D) -ae
36. If the original holotype is lost, the selected substitute specimen is called :
- (A) Neotype
 - (B) Isotype
 - (C) Syntype
 - (D) Epitype
37. The specimen on which the description of a new species is based is called :
- (A) Isotype
 - (B) Paratype
 - (C) Holotype
 - (D) Lectotype
38. In binomial nomenclature, the first word indicates :
- (A) Species
 - (B) Variety
 - (C) Genus
 - (D) Family
39. The principle of Priority states that :
- (A) The oldest validly published name is accepted
 - (B) The shortest name is accepted
 - (C) The most common name is accepted
 - (D) The name given by Linnaeus is always accepted
40. ICBN stands for :
- (A) International Code of Botanical Nomenclature
 - (B) International Code of Biology Nomenclature
 - (C) Both (A) and (B)
 - (D) None of the above
41. The Takhtajan classification system is based on :
- (A) Only morphology.
 - (B) Morphology + anatomy + embryology + cytology + phylogeny
 - (C) Floral color
 - (D) Economic importance

42. In Takhtajan system, dicots are called :
- (A) Liliopsida
 (B) Magnoliopsida
 (C) Cycadopsida
 (D) Coniferopsida
43. Takhtajan placed angiosperms under division :
- (A) Magnoliophyta
 (B) Anthophyta
 (C) Spermatophyta
 (D) Tracheophyta
44. Takhtajan classification is mainly :
- (A) Artificial
 (B) Natural
 (C) Phylogenetic
 (D) Morphological
45. The major drawback of Bentham and Hooker system is :
- (A) Based on floral characters only
 (B) No phylogenetic basis
 (C) Based on molecular data
 (D) Too simple
46. Bentham and Hooker system is considered :
- (A) Artificial
 (B) Natural
 (C) Phylogenetic
 (D) Molecular
47. In Bentham & Hooker's system, Dicots are divided into :
- (A) Polypetalae, Gamopetalae, Monochlamydeae
 (B) Archichlamydeae and Metachlamydeae
 (C) Monochlamydeae and Polypetalae
 (D) Rosidae and Asteridae
48. Bentham and Hooker divided flowering plants into :
- (A) 2 classes
 (B) 3 classes
 (C) 4 classes
 (D) 5 classes
49. Bentham and Hooker's system is mainly based on :
- (A) Phylogeny
 (B) Evolutionary relationships
 (C) Natural affinities
 (D) Molecular data
50. The classification system proposed by Bentham and Hooker was published in :
- (A) *Species Plantarum*
 (B) *Genera Plantarum*
 (C) *Systema Naturae*
 (D) *Origin of Species*

51. The formula $\% \begin{matrix} \text{♂} \\ \text{♀} \end{matrix} K(5) C1+2+(2) A(9)+1 G1$ belongs to :
- (A) Fabaceae
(B) Solanaceae
(C) Lamiaceae
(D) Poaceae
52. The floral formula of Poaceae is :
- (A) $\begin{matrix} \text{♂} \\ \text{♀} \end{matrix} K(5) C(5) A5 G(2)$
(B) $\begin{matrix} \text{♂} \\ \text{♀} \end{matrix} P3+3 A3+3 G(3)$
(C) $\begin{matrix} \text{♂} \\ \text{♀} \end{matrix} P2 A3 G(3)$
(D) $\begin{matrix} \text{♂} \\ \text{♀} \end{matrix} K(5) C1+2+(2) A(9)+1 G1$
53. Perianth in Poaceae is represented by :
- (A) Petals
(B) Pappus
(C) Lodicules
(D) Corona
54. Inflorescence in Arecaceae is :
- (A) Spike
(B) Spadix with spathe
(C) Capitulum
(D) Umbel
55. Fusion of androecium and gynoecium forms :
- (A) Corona
(B) Gynophore
(C) Column (Gynandrium)
(D) Spur
56. Orchidaceae is characterized by :
- (A) Actinomorphic flowers
(B) Resupinate flowers
(C) Cruciform corolla
(D) Capitulum inflorescence
57. Presence of milky latex is common in :
- (A) Lamiaceae
(B) Euphorbiaceae
(C) Solanaceae
(D) Asteraceae
58. A special type of inflorescence in Euphorbiaceae is :
- (A) Verticillaster
(B) Cyathium
(C) Capitulum
(D) Spike

59. Inflorescence in Lamiaceae is commonly :
- (A) Capitulum
 - (B) Verticillaster
 - (C) Umbel
 - (D) Corymb
60. A special feature of Acanthaceae fruit is :
- (A) Pappus
 - (B) Retinacula (jaculators)
 - (C) Pollinia
 - (D) Gynophore
61. Placentation in Solanaceae is :
- (A) Parietal
 - (B) Basal
 - (C) Axile
 - (D) Free central
62. Plants of Apocynaceae usually contain :
- (A) Alkaloids and latex
 - (B) Essential oils
 - (C) Tannins
 - (D) Resins only
63. Presence of pollinia is a characteristic of :
- (A) Solanaceae
 - (B) Asclepiadaceae
 - (C) Asteraceae
 - (D) Acanthaceae
64. Fruit of Asteraceae is :
- (A) Berry
 - (B) Cypsela
 - (C) Legume
 - (D) Capsule
65. Anthers in Asteraceae are :
- (A) Free
 - (B) Monadelphous
 - (C) Syngenesious
 - (D) Diadelphous
66. Calyx in Asteraceae is modified into :
- (A) Corona
 - (B) Pappus
 - (C) Spur
 - (D) Ligule
67. The inflorescence of Asteraceae is :
- (A) Corymb
 - (B) Umbel
 - (C) Capitulum
 - (D) Spike
68. Economic importance of Rubiaceae includes :
- (A) Rubber
 - (B) Coffee
 - (C) Opium
 - (D) Tea

69. Leaves in Rubiaceae are :
- (A) Alternate
 - (B) Opposite with interpetiolar stipules
 - (C) Whorled without stipules
 - (D) Compound
70. Placentation in Myrtaceae is :
- (A) Parietal
 - (B) Free central
 - (C) Axile
 - (D) Basal
71. Leaves of Myrtaceae are :
- (A) Exstipulate with oil glands
 - (B) Stipulate
 - (C) Compound
 - (D) Parallel venation
72. Stamens in Fabaceae are usually :
- (A) Polyandrous
 - (B) Diadelphous (9 + 1)
 - (C) Syngenesious
 - (D) Epipetalous
73. Aestivation in Fabaceae is :
- (A) Valvate
 - (B) Twisted
 - (C) Vexillary
 - (D) Imbricate
74. The corolla in Fabaceae is :
- (A) Cruciform
 - (B) Papilionaceous
 - (C) Tubular
 - (D) Ligulate
75. Gynophore is commonly found in :
- (A) Fabaceae
 - (B) Capparidaceae
 - (C) Myrtaceae
 - (D) Rubiaceae
76. Androecium in Capparidaceae is often :
- (A) Tetradynamous
 - (B) Polyandrous
 - (C) Monadelphous
 - (D) Syngenesious

77. Cappariaceae shows close affinity with :
- (A) Malvaceae
 - (B) Brassicaceae
 - (C) Solanaceae
 - (D) Fabaceae
78. Fruit of Magnoliaceae is generally :
- (A) Berry
 - (B) Capsule
 - (C) Aggregate of follicles
 - (D) Drupe
79. The family Magnoliaceae is characterized by :
- (A) Inferior ovary
 - (B) Numerous free carpels arranged spirally
 - (C) Zygomorphic flowers
 - (D) Syngenesious stamens
80. An ideal DNA barcode region should be :
- (A) Highly conserved only
 - (B) Highly variable only
 - (C) Conserved with sufficient variation
 - (D) Random
81. Cladistics is based on :
- (A) Overall similarity
 - (B) Shared derived characters
 - (C) Artificial keys
 - (D) Habit
82. Molecular phylogeny primarily constructs :
- (A) Herbarium sheets
 - (B) Dendrograms
 - (C) Phylogenetic trees
 - (D) Fossils
83. The concept of DNA barcoding was proposed by :
- (A) Linnaeus
 - (B) Darwin
 - (C) Paul Hebert
 - (D) Takhtajan
84. The standard barcode regions for plants are :
- (A) COI gene
 - (B) rbcL and mat
 - (C) ITS only
 - (D) 18S rRNA only

85. DNA barcoding is especially useful in :
- (A) Morphological classification only
 - (B) Identifying cryptic species
 - (C) Studying fossils
 - (D) Economic botany only
86. The most primitive extant angiosperm according to APG is :
- (A) Magnolia
 - (B) Nymphaea
 - (C) Amborella
 - (D) Ranunculus
87. The most recent widely accepted APG system is :
- (A) APG I
 - (B) APG II
 - (C) APG III
 - (D) APG IV
88. The APG classification is mainly based on :
- (A) Morphology only
 - (B) Embryology only
 - (C) Molecular phylogeny
 - (D) Economic importance
89. Hypanthodium inflorescence is characteristic of which plant family?
- (A) Fabaceae
 - (B) Moraceae
 - (C) Asteraceae
 - (D) Poaceae
90. The most commonly used DNA in plant phylogeny is :
- (A) Mitochondrial DNA
 - (B) Chloroplast DNA
 - (C) Ribosomal DNA
 - (D) Satellite DNA
91. Who is recognized for integrating embryological evidence into plant taxonomy and establishing the foundation of embryotaxonomy?
- (A) Carolus Linnaeus
 - (B) G. L. Coulter
 - (C) P. Maheshwari
 - (D) Charles Darwin
92. Embryological evidence indicates that the Lamiaceae family evolved from :
- (A) Fabaceae
 - (B) Poaceae
 - (C) Orchidaceae
 - (D) Arecaceae

93. Polyembryony is taxonomically significant in :
- (A) Citrus
 - (B) Wheat
 - (C) Rice
 - (D) Mustard
94. The genus Agave was separated from Amaryllidaceae and kept under Agavaceae because it shows :
- (A) Variable chromosome number
 - (B) Different chromosomal behaviour
 - (C) Various chromosomal bending patterns
 - (D) Different chromosomal size
95. Helobial type of endosperm is commonly found in :
- (A) Dicots
 - (B) Monocots
 - (C) Gymnosperms
 - (D) Bryophytes
96. Unitegmic ovules are commonly found in :
- (A) Monocots
 - (B) Gymnosperms
 - (C) Dicots only
 - (D) Bryophytes
97. The most common type of ovule in angiosperms is :
- (A) Orthotropous
 - (B) Anatropous
 - (C) Campylotropous
 - (D) Amphitropous
98. Double fertilization is a characteristic of :
- (A) Gymnosperms
 - (B) Bryophytes
 - (C) Angiosperms
 - (D) Pteridophytes
99. Embryological characters are considered taxonomically important because they are :
- (A) Highly variable
 - (B) Environmentally influenced
 - (C) Genetically controlled and stable
 - (D) Temporary
100. The use of embryological characters in classification is called :
- (A) Cytotaxonomy
 - (B) Palynotaxonomy
 - (C) Embryotaxonomy
 - (D) Chemotaxonomy

(Only for Rough Work)

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the correct answer and mark the same in the OMR Answer-Sheet as per the direction :

Example :

Question :

- Q. 1 (A) ● (C) (D)
 Q. 2 (A) (B) ● (D)
 Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. : On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर—A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

- प्रश्न 1 (A) ● (C) (D)
 प्रश्न 2 (A) (B) ● (D)
 प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण : प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।