



DEPARTMENT OF BOTANY

NAMBOL L. SANOI COLLEGE, NAMBOL

QUESTION BANK

5TH Semester BOT: SE H—506 (HONOURS)

PREVIOUS 5 YEARS (2016-2020)

PAPER-V / BOT: SE H-506: Primitive seed plants and Palaeobotany, Advanced Plant Taxonomy, Plant Resources , Anatomy of Angiosperm , Embryology and Palynology .

UNIT-1: PRIMITIVE SEED PLANTS AND PALAEOBOTANY

VERY SHORT ANSWER TYPE

(1 MARK QUESTIONS)

- (a) **What is *Palmoxylon*? (2016)**
- (b) **Why is *Rhynia* regarded as primitive vascular plant? (2016)**
- (c) **Name a gymnosperm in which arillate ovule is present. (2017)**
- (d) **What are stromatolites? (2017)**
- (e) **Why is *Rhynia* called early vascular plant? (2018)**
- (f) **Differentiate between syndetocheilic and haplocheilic stomata in gymnosperms. (2018)**
- (g) **Distinguish between Manoxylic and Pycnoxylic woods of gymnosperms. (2019)**
- (h) **Why is *Spirulina* considered as single cell protein? (2019)**
- (i) **Give the botanical name of any fossil fungi. (2020)**
- (j) **What is stigmarian root system. (2020)**
- (k) **Give one point of difference between Syndetocheilic and Haplocheilic stomata in gymnosperms. (2020)**

SHORT ANSWER TYPE

(3 MARKS QUESTIONS)

- (a) Enumerate the features required for the successful establishment of early vascular plant in remote past. (2016)
- (b) Write the salient morphological features of *Ephedra*. (2016)
- (c) Name a gymnosperm in which arillate ovule is present. (2017)
- (d) What are stromatolites? (2017)
- (e) Name the fossil Bennettitales reconstructed by Birbal Sahni (1932). Mention the different form genus of the reconstructed plant. (2018)
- (f) Draw and label a portion of female dwarf shoot of *Ginkgo* showing Microsporangia. (2018)
- (g) Describe in short the concept of progymnosperms in regarded to the origin of gymnospermous structure. (2019)
- (h) Write a short note on *Sahnianthus*. (2019)
- (i) Give the scientific names of any three species of gymnosperms originally found in Manipur. (2020)
- (j) Draw a neat labelled diagram of a sporophytic plant of Sphenophyllum. (2020)
- (k) Enumerate the features required for the successful establishment of early vascular plant in remote past. (2020)

ESSAY TYPE (12 MARKS QUESTIONS)

- (a) Describe with neat labelled diagrams, the Staminate and ovulate strobilus of *Ginkgo biloba*. 6 (2016)
- (b) On the basis of morphological and anatomical characters, differentiate between *Lepidodendron* and *Calamites*. 6 (2016)
- (c) Enumerate the characteristic features of the fossil order Cordaitales. 6 (2017)
- (d) Trace the sequences of development of male gametophyte in *Taxus* with suitable diagrams. 6 (2017)
- (e) With neat labelled diagrams, describe the staminate and ovulate strobilus of *ephedra*. 6 (2018)
- (f) Compare *Sphenophyllum* and *Calamities* with reference to the Morphological and anatomical

features. 6 (2018)

(g) Differentiate between Rhynia and Calamities on the basis of morphological and anatomical Characters. 6 (2019)

Or

(h) Draw and describe the female strobilus of Ephedra. 6 (2019)

(i) Compare the general characters of Bennettitales with that of Corditales with six points. 6 (2020)

Or

(j) Trace the sequence of development of male gametophyte of Taxus with suitable diagrams. 6 (2020)

UNIT II: ADVANCED PLANT TAXONOMY

VERY SHORT ANSWER TYPE

(1 MARK QUESTIONS)

- (a) What does '80 phenon' signify in numerical taxonomy? (2016)
- (b) What is gynostemium? (2016)
- (c) When did (year) J.D. Hooker first publish Flora of British India? How many volumes it had? (2017)
- (d) What is folk taxonomy? (2017)
- (e) Who established Central National Herbarium (CNH) and in which year. (2018)
- (f) What is 'doctrine of signature'? (2018)
- (g) Who wrote the book, On the Plants of Kohima and Muneypore? (2019)
- (h) In a botanical field study tour, a student has collected a plant possessing following morphological characters: Herbs with milky latex; flowers gynandrous; stamens 5 adnate to the pistil forming gynostegium; bicarpellary; stigma 5-angular; fruit of two follicles. Assign the family to which this plant could belong.
- (h) Who wrote the book, Plant Hunter in Manipur? (2020)
- (i) In which city 'The Central National Herbarium' is located? (2020)

- (j) In a botanical field study tour, a student has collected a plant possessing following Morphological characters: Herb with 3-angled stem, solid clum; leaves entire with sheathing leaf base; flowers Spikelet of glume subtended by a single glume, naked, stames tree; tricarPELLary, Ovary superior with single ovule. Assign the family to which this plant could belong. (2020)

SHORT ANSWER TYPE

(3 MARKS QUESTIONS)

- (a) What is cytotaxonomy? Discuss its limitations. (2016)
- (b) Identify the family of the following taxonomic features and assign a species belonging each family: (2016)
- (i) Trees or shrubs with latex; flowers unisexual, perianths 2-4; stamens 2-6; ovary 1-2 embryo curved
 - (ii) Trees with unbranched stem and a crown of leaves; flowers generally unisexual in spadix subtended by spathaceous bract; perianth 6, free, persistent; ovary 3-chambered
 - (iii) Herbs or shrubs; leaves with ochreate stipule; flower bisexual, perianth 6, free; stamens 6-9; ovary triangular, 1-celled
- (c) List three reasons for using chemical characters for taxonomic purposes. (2017)
- (d) Define the following terms and mention the name of the family in which these terms have been describe. Cite the scientific name of a plant each from these families: (2017)
- (i) Jaculator
 - (ii) Hypanthodium
 - (iii) Rostellum
- (h) What activities have been undertaken by the Botanical Survey of India(BSI) for the conservation of biodiversity?
- (i) Assign the family to the following genera: (2018)
Strobilanthes, Holigarna, Cascabela, Kaempferia, Trchosanthes and Syzygium
- (j) Compare the timbers of *Melanorrhoea* and *Pinus* in terms of their wood and Characters. (2018)
- (k) Differentiate between Dipterocarpaceae and Rubiaceae on the basis of their floral

conservation. (2019)

- (l) Comment on the role of DNA markers in taxonomic studies. (2020)
- (m) Name any two plant taxonomic journals published in India. In which respect does Flora differ Monographs? (2020)
- (n) Assign the family of the plant with which the following identifying characters are associated and mention one species from each family: (2020)
 - (i) Big trees with resin, coriaceous leaves, sepals persistent, polypetalous, stamen many, tricarpeal, syncarpous, fruit samara enclosed in persistent calyx
 - (ii) Plant rarely trees, gamopetalous, corona arising as outgrowth of petals or stamens, Stamen fused with stigmatic disc forming gynostegium, style free, pollinia formed
 - (iii) Generally shrubs and trees, presence of gum or acrid juice, polypetalous Actinomorphic, stamens inserted on intra-staminal disc, carpel 1-2, fruit drupe

ESSAY TYPE (12 MARKS QUESTIONS)

- (a) Compare the diagnostic features of the family Myrtaceae and Rutaceae emphasizing on the floral organization and floral formula, and also provide one economically important plant from each family. 6 (2016)
- (b) What is herbarium? Describe the techniques involved in the preparation of herbarium specimens. 1+5=6 (2016)
- (c) What is numerical taxonomy? Briefly state the steps employed in the construction of taxonomy groups in numerical taxonomy. 6 (2017)
- (d) Compare the distinctive characters of Plamae and Musaceae by furnishing floral formula. Mention one economically important plant each from the families. 5+1=6 (2017)
- (e) By referring specific examples, highlight the role of chemotaxonomy in solving certain taxonomic problems. 6 (2018)
- (f) Give a critical assessment of the classification of Bentham and Hooker. 6 (2018)

Or

Substantiate the following:

- (a) Asteraceae is regarded as the most highly evolved taxon. 6

- (b) **Magnoliaceae possesses evolutionary primitive characters. 6**
- (g) **Discuss the role of biochemical markers in taxonomic studies. 6 (2019)**
- (h) **Which family is considered to be the most highly evolved among the dicotyledons? Give reasons in support of your answer. 6 (2019)**
- (i) **Which family is the most highly evolved among monocotyledons? Give reasons in support of your answer. 6 (2020)**

Or

What is numerical taxonomy? Briefly state the states employed in the construction of taxonomic groups in numerical taxonomy.

- (j) **Compare the flowers of Musaceae, zingiberaceae and Marantaceae citing one species from each family. 6 (2020)**

Or

Discuss the role of cytological characters in solving some taxonomic problems by giving a few suitable examples. 6

UNIT III: PLANT RESOURCES – MANAGEMENT AND UTILIZATION

VERY SHORT ANSWER TYPE

(1 MARK QUESTIONS)

- (a) **Name the plant and its part from which safflower oil is extracted. (2016)**
- (b) **Mention one anticoagulant used during the process of tapping latex from rubber plant. (2016)**
- (c) **Name a plant each which belongs to Kharif and Rabi crops respectively. (2017)**
- (d) **Which chemical compound is responsible for the pungency of mustard plant/oil? (2017)**
- (e) **What is SCP? Give an example. (2018)**
- (f) **Distinguish between economic botany and ethnobotany. (2018)**
- (g) **Who wrote the book, On the Plants of Kohima and Moneypore? (2019)**
- (h) **Why is *Spirulina* considered as single cell protein? (2019)**
- (i) **Where is the center of origin of maize? (2019)**

(j) Distinguish between Pharmacology and Pharmacognosy. (2020)

(k) Which chemical compound is responsible for the pungency of mustard oil? (2020)

SHORT ANSWER TYPE

(3 MARKS QUESTIONS)

- a) The chemical compound is banned in the sporting world for stimulating sympathetic nervous system but is an important compound used in the manufacture of drugs for the treatment of bronchial coughs, asthma, etc. Identify the chemical compound. Give the botanical name of the plant from which it is extracted and its family. (2016)**
- (b) Give the botanical name, family and the part of the medicinal plant which yields the following Chemical compounds: (2016)**
- (i) Vincristine**
 - (ii) Carthamin**
 - (iii) Aloin**
- (c) "Ethnobotany plays an important role in germplasm and gene pool conservation." Support the statement with your views. (2017)**
- (d) Outline the steps involved in the preparation of crude drugs for commercial market. (2017)**
- (e) Mention the scientific name, family and parts of the plant from which the following are obtained: (2018)**
- (i) Burmese lacquer**
 - (ii) Corn syrup**
 - (iii) Gurjan plywood**
- (f) Compare the timbers of Melanorrhoea and Pinus in terms of their wood and Characters. (2018)**
- (g) Write in brief the role of ethnobotany in germplasm conservation. (2019)**
- (h) Distinguish between Drying oil and Semi-drying oil by giving suitable examples. (2019)**
- (i) Give the scientific names of one drug-yielding plant each from, Apocynaceae and compositae, mentioning the names of active chemical compounds present and the therapeutic uses. (2020)**
- (j) Why is banana regarded as one of the most nutritious and nourishing foods? (2020)**

ESSAY TYPE (12 MARKS QUESTIONS)

- (a) Classify the economically important plants according to Hill (1952). 6 (2016)
- (b) Write an account on the cultivation and improvement of maize. 6 (2016)
- (c) Describe the origin, cultivation and uses of banana. 6 (2017)
- (d) Mention the non-mechanical properties of woods. 6 (2017)
- (e) Outline the history, method of cultivation and steps of processing of rubber. 3+3+6=1 (2018)
- (f) Classify economically important plants according to B. Brouk (1975). 6 (2018)
- (g) Give the scientific names of one drug-yielding plant each from Apocynaceae, Compositae and Liliaceae mentioning one active chemical compound present. Mention their therapeutic uses. 2+2+2=6 (2019)
- (h) Describe the origin, cultivation and uses of pea. 6 (2020)

Or

Write an account on the improvement of mustard. 6

- (i) What is timber? Describe the different mechanical properties of wood. 6 (2020)

Or

Describe the different steps involved in the processing of crude rubber. 6

UNIT IV: ANATOMY OF ANGIOSPERM

VERY SHORT ANSWER TYPE

(1 MARK QUESTIONS)

- (a) What is quiescent centre? (2016)
- (b) Name two specialized parenchymatous cell. (2016)
- (c) Name the two main types of sclerenchyma. (2017)
- (d) Mention a primary and a secondary anomalous structure found in stems with Example. (2017)
- (e) What is the name of the most primitive type of stele found in vascular plants? (2018)
- (f) Draw a labelled diagram of a monocotyledonous stomata. (2018)
- (g) Differentiate between Early wood and Late wood by one point only. (2019)
- (h) Which component of cambium gives rise to tracheid and vessel elements? (2019)
- (i) What is the name of the most primitive type of stele found in vascular plants? (2020)

(j) From the ontogenetic point of view, differentiate a sieve tube from a sieve cell. (2020)

SHORT ANSWER TYPE

(3 MARKS QUESTIONS)

- (a) On what basis did Metcalfe and Chalk recognize how many types of stomata? Name them. (2016)
- (b) What are growth rings? How are these formed? (2016)
- (c) Describe in short, the structure and function in tapetum. (2017)
- (d) Mention three reasons for the development of anomalous secondary growth in Dicotyledonous stem. (2017)
- (e) What are the characteristic features of collenchyma? Classify it on the basis of distribution of wall thickenings. (2018)
- (f) Distinguish between Histogen theory and Tunica corpus theory with three points. (2018)
- (g) Write a short note on the anatomical changes involved in root-stem Transition zone. (2019)
- (h) Differentiate between primary and secondary cambial cells. (2019)
- (i) What are the characteristic features of collenchyma? Classify it on the basis of distribution of wall thickenings. (2020)
- (k) How can you distinguish Histogen theory from Tunica corpus theory? Give three points. (2020)
- (l) Draw a labelled diagram of a paracytic and diacytic types of stomata. (2020)

ESSAY TYPE (12 MARKS QUESTIONS)

- (a) Give an illustrated account of the different types of root-stem transition of vascular tissue in angiosperms. 12 (2016)

Or

What do you mean by anomalous secondary growth? Describe how it occurs in

Bougainvillea and *Nyctanthes* with labelled diagrams. 4+8=12

- (b) What do you understand by the secondary growth in thickness? With outline sketches, describe how secondary growth takes place in the intrastelar regions of a dicotyledonous stem. 4+8=12 (2017)

Or

- (c) Enumerate three main theories relating to the structural development and differentiation of root apex organization in angiosperm with suitable diagrams. 12 (2018)
- (d) Describe the structure and function of vascular cambium with suitable diagrams. How do seasonal changes affect the cambial activity? 8+4=12 (2019)

Or

How is secondary xylem formed? Describe the various structural components secondary xylem and their arrangement with suitable diagram. 5+7=12 (2019)

- (e) Describe the anomalous secondary growth in *Nycanthes* with outline diagram. 6 (2020)

Or

Draw and describe the structure of cambium. 6

- (f) Discuss any two theories of structural development and of shoot apex in differentiation flowering plants. 6 (2020)

Or

Draw and describe any two types of root-stem transition found in angiosperms. 6

UNIT V: PLANT EMBRYOLOGY AND PALYNOLOGY

VERY SHORT ANSWER TYPE

(1 MARK QUESTIONS)

- (a) Distinguish between crassinucellate and tenuinucellate ovule. (2016)
- (b) What is adventive embryony? (2016)
- (c) What is sporopollenin? (2017)
- (d) Differentiate between Crucifer and Solanad type of embryo development in dicotyledons. (2017)
- (e) What is polyspermy? (2018)
- (f) Name the type of tetrasporic embryo sac in which antipodal nuclei are triploid and polar nucleus is tetraploid. (2018)

- (g) Write one point of difference between Basic Palynology and Applied Palynology. (2019)
- (h) Who is known as the 'father of Indian Palynology'? (2019)
- (i) What is mellitopalynology? (2020)
- (j) Define triple fusion. (2020)
- (k) Who proposed 'opposition S-allele concept' of genetic control of self-Incompatibility? (2020)

SHORT ANSWER TYPE

(3 MARKS QUESTIONS)

- (a) Distinguish between Melissopalynology and Forensic palynology with three points. (2016)
- (b) Distinguish between non-recurrent and recurrent type of apomixis with three points. (2017)
- (c) Represent diagrammatically the Gametophytic Self Incompatibility (GSI) on the basis of 'opposition S-allele concept'. (2017)
- (d) Define polyembryony and mention its significance. (2018)
- (e) Write a short note on the role of pollen morphology in taxonomy. (2018)
- (f) Draw and label a polygonum type of embryo sac. (2019)
- (g) Discuss the role of pollen morphology in taxonomic studies. (2019)
- (h) Describe the three main routes by which pollen tube may enter the ovule. (2020)
- (i) What is apomixis? Name its types. (2020)

ESSAY TYPE (12 MARKS QUESTIONS)

- (a) On what basis the tetrasporic embryo sac is classified? Provide only organization of all types of tetrasporic embryo sac. 5+7=12 (2016)

Or

Describe the post-fertilization changes that take place in the ovule of an

angiosperm leading to the formation of a seed. 12

- (b) What is microsporogenesis? Describe the sequential steps involved in the development of Microspores (pollen grains) in angiosperm with necessary diagrams. 2+10=12 (2017)**

Or

With suitable labelled diagrams, trace the development and fate of male gametes till fertilization in angiosperms. 12

- (c) Describe the structure and development of different types of endosperm found in angiosperms with neat labelled diagrams. 12 (2018)**

- (d) (a) Trace the development of male gametophytes till fertilization in angiosperms by giving suitable diagrams. 6 (2019)**

- (b) Give an illustrated account of various types of endosperm found in angiosperms. 6**

- (e) Compare the development of Polygonum type of embryo sac with that of plumbago type with labelled diagram. 6 (2020)**

Or

Describe the development of a typical dicotyledonous embryo giving suitable diagrams. 6

- (f) Describe the various types of polyembryony found in angiosperms. 6 (2020)**

Or

Describe with suitable diagrams the genetical basis of different types of self-incompatibility. 6