

M.Sc. Botany
March 2016

कल्पक - 001

Seat Number

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Botany

BOT-3.1 :
Gymnosperm and Paleobotany (New)
(141301)

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions taking two questions from each section.
5. Answer to the two sections should be written in separate answer books.
6. All questions carry equal marks.
7. Draw labelled diagrams wherever necessary.

SECTION - I

1. Explain how different families of coniferales show combination of primitive and advance characters. **20**
2. Comment on Interrelationships and affinities of Gnetales. **20**
3. a) How Taxales separate from coniferales. **10**
b) Classification of gymnosperms by D.D. pant (1957) **10**
4. Write short notes on **any four**. **20**
 - a) Affinity of cycadales with pteridospermales.
 - b) Vegetative structure of Welwit schiq.
 - c) Morphological nature of Aril in Taxus.
 - d) Economic importance of Gymnosperms.
 - e) Female strobilus of Ginkgo.
 - f) Distribution of Gymnosperms in India.

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SECTION – II

5. Explain the role of Paleobotany in oil & coal exploration. 20
6. Explain geological time table with prevailing climatic conditions & relevant major plant groups. 20
7. a) Fructifications of calamitales. 10
b) External & internal morphology of Lyginopteris & Cordaites. 10
8. Write notes on any four. 20
a) Psilophyton Princeps.
b) Lepidodendron.
c) Pentoxylon.
d) Stauropteris.
e) Enigmocarpus.
f) Ground tuin section.

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BOT-4.1

Developmental Botany (New)
(141401)

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions taking two questions from each section.
5. Answer to the two sections should be written in separate answer book.
6. All questions carry equal marks.
7. Neat diagrams must be drawn wherever necessary.

SECTION – I

- | | | |
|----|--|----|
| 1. | Describe the development, structure and function of microsporangium in Angiosperm and add a note on tapetum. | 20 |
| 2. | a) Rammayya's Classification of trichomes. | 10 |
| | b) Stomatal classification by stace. | 10 |
| 3. | Describe the structure and development of dicotyledonous embryo. Add a note on nutrition's of embryos. | 20 |
| 4. | Write notes on any four of the following. | 20 |
| | a) Pollen kitt | |
| | b) Causes of polyembryony. | |
| | c) Pollen-pistil interaction. | |
| | d) Structure of endosperm. | |
| | e) Pollen allergy. | |
| | f) Megasporogenesis. | |

SECTION – II

5. Describe different theories of zonation and differentiation. 20
6. Give Schnarf's classification of dicot embryos and describe salient features of each type. 20
7. Describe with suitable examples. 20
- a) Geopalynology.
- b) Melittopalynology.
8. Write notes on **any four** of the followings. 20
- a) Anther and Pollen culture.
- b) Syngial Polyembryony .
- c) Anomalous secondary growth in Dracaena.
- d) Pollen embryo sac
- e) Aerobiology
- f) Types of cambium.

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**BOT-3.2**

**Plant Biotechnology and Bioinformatics
(New) (141302)**

P. Pages : 1

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** question, taking two question from each section.
5. Answer to the two section should be written in separate answer book.

SECTION – I

1. What is MS media ? Describe the role of different ingredients in MS media. **20**
2. Explain somatic embryogenesis and gametic embryogenesis. **20**
3. What is cloning vector ? why they are necessary. **20**
4. Write short note on **any four**. **20**
 - a) Totipotency
 - b) Southern blotting
 - c) Cryopreservation & germplasm storage.
 - d) PCR
 - e) Construction of chimeric DNA
 - f) Meristem culture

SECTION – II

5. What is Bioinformatics ? Describe possible application of Bioinformatics. **20**
6. Give details about DNA sequencing. **20**
7. Explain in details the Role of Transgenic plant in improvement of crop productivity & in medicine. **20**
8. Write short note on **any four**. **20**

a) Secondary metabolites	b) Genomics
c) Cybrid	d) Biotechnology in India
e) Direct gene transfer	f) Agrobacterium

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BOT-3.2

**Environmental Botany and Biostatistics
(Old) (302)**

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions, taking at least two questions from each section
5. Use separate answer book for each section.
6. All question carry equal marks.

SECTION – I

1. Give the detail account of legislation related to environment. 20
2. What is ecotourism? Explain its type and impact on environment. 20
3. What is environmental management? Give its scope & procedure of EIA (Environmental Impact Assessment) 20
4. Write short note on any four. 20
 - a) Social Forestry.
 - b) Wild life protection Act - 1972.
 - c) Biotic component.
 - d) Green Belt.
 - e) Disadvantages of agrochemicals.
 - f) Types & source of solid -waste.

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SECTION – II

5. What is terrestrial ecosystem? Explain forest ecosystem and grassland ecosystem. 20
6. Calculate mean, median, mode & range for following data. 20
Height of 10 cotton plants in cms.
16, 18, 20, 20, 20, 22, 22, 22, 24, 26.
7. Explain different types of soil. 20
8. Write short note on any four. 20
- a) Merits & demerits of median.
 - b) Scope of statistics.
 - c) Advantages of drip irrigation.
 - d) Watershed management.
 - e) Forest conservation
 - f) Scope of environmental science.

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BOT-4.23

Genetics and Plant Breeding Special Paper - II (New)
(141404)

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions taking two questions from each section.
5. Use separate answer book for each section.
6. All questions carry equal marks.

SECTION - I

1. Describe different approaches to analyze gene expression. 20
2. What is C-value paradox? Discuss the role of transposons in genome deviation. 20
3. Attempt **any two** among following. 20
 - a) Development of carcinoma.
 - b) Gene trapping and gene silencing.
 - c) RNA polymerase and gene regulation.
4. Write **any four** short notes; among following. 20
 - a) Split genes.
 - b) Cellular basis of immunity.
 - c) SNP Markers.
 - d) Proteome analysis.
 - e) Human genome project.
 - f) DNA microarray.

SECTION - II

5. Describe with suitable example breeding methodology applied to overcome from the susceptibility of disease in local variety. 20
6. What is ideotype concept? Explain procedure of ideotype development with suitable example. 20
7. Solve **any two** among the following. 20
- a) Chilling stress at cellular and plant level.
 - b) Describe procedure applied in mutation breeding.
 - c) Improvement of quality characters in cash crops.
8. Write short notes on **any four**. 20
- a) Seed industries in India.
 - b) CIMMYT.
 - c) Salinity tolerance
 - d) Seed multiplication.
 - e) Distant hybridization.
 - f) Breeding for oil quality.

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BOT-2.2
Diversity of Higher Cryptogams
(New) (141202)

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions, two questions from each section.
5. Answer to the two section should be written in separate answer book.
6. All questions carry equal marks.
7. Draw labelled diagrams wherever necessary.

SECTION – I

1. Trace the evolution of sporophytes of Bryophyte. 20
2. Give the salient features of the order Jungermanniales, state in what respect do the Jungermanniales (a) differs and (b) Resembles the Marchantiales ? 20
3. Give distinguishing features of the order Calobryales and comment on its interrelationship and evolutionary tendencies. 20
4. Write short notes on **any four**. 20
 - a) Takakia.
 - b) Capsule of Sphagnum.
 - c) Contribution of Kashyap.
 - d) Anthoceros sporophyte.
 - e) Gemma cup.
 - f) Distribution of Bryophytes in India.

SECTION – II

5. Write an essay on soral evolution in pteridophytes. 20
6. Give an account of distinguishing features, morphology, anatomy and gametophyte of osmundales. 20
7. a) Outline Reimers classification of the pteridophytes. 10
b) Primitive and advanced characters of Filicales. 10
8. Write short notes on any four. 20
- a) Xerophytic characters of Equisetum.
- b) Synangium of Psilotum.
- c) Spike of Ophioglossum.
- d) Sporophylls of Isoetes.
- e) Economic importance of pteridophytes.
- f) Strobilus of Selaginella.

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BOT-4.33

**Genetics and Plant Breeding Special
Paper - III (New) (141408)**

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions taking **two** questions from each section.
5. Use separate answer books for each section.
6. All questions carry equal marks.

SECTION – I

1. How marker assisted selection is applied in plant breeding explain? 20
2. How gene transfer technology is applied to improve cash crops in recent years explain? 20
3. Solve **any two** among following. 20
 - a) Applications of plant tissue culture.
 - b) Gene transfer through A. tumefaciens.
 - c) Information management system.
4. Write short notes on **any four**. 20

a) Bt Brinjal	b) Gene pyramiding.
c) Cryo-preservation.	d) Embryo culture.
e) Molecular mapping.	f) QTL analysis.

SECTION – II

5. Describe in detail Indian legislation for the protection of plant varieties, farmers rights and patents. 20
6. Explain food safety assessment approval procedure for G. M. foods. 20
7. Solve any two among the following. 20
- a) Proteome analysis.
 - b) Role of microarrays in functional genomics.
 - c) Importance of research collaboration and license agreement.
8. Write short notes on any four. 20
- a) HPLC
 - b) Proteomics and mass spectroscopy.
 - c) Protein expression.
 - d) SNP detection.
 - e) ISO electrical focusing.
 - f) TRIPS.

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BOT-2.3

Plant Physiology and Biochemistry (New)
(141203)

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions, taking at least two questions from each section.
5. Use separate answer book for each section.
6. All questions carry equal marks.

SECTION - I

- | | | |
|----|--|----|
| 1. | What is photosynthesis? Give the details of cyclic and non-cyclic photophosphorylation. | 20 |
| 2. | Define translocation. Explain mechanisms of loading and unloading photoassimilates. | 20 |
| 3. | What is hydrogen ion concentration? Give an illustrated account of p ^H scale. | 20 |
| 4. | Write short notes on any four . | 20 |
| | a) Salt stress. | |
| | b) RQ. (Respiratory quotient). | |
| | c) Factors affecting the respiration. | |
| | d) Formation of sucrose. | |
| | e) Receptor gateway. | |
| | f) Biological clock. | |

SECTION - II

5. What are secondary metabolites? Explain in brief biosynthesis of phenols. **20**
6. What is oxidation reduction? Give an account of redox potential and its measurement. **20**
7. Explain the TCA cycle. **20**
8. Write short notes on **any four**. **20**
- a) Scope of plant physiology.
 - b) Auxins.
 - c) Photosynthetic pigments.
 - d) Microelements.
 - e) G-protein coupled receptor.
 - f) Temperature stress.

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BOT-2.1

Diversity of Lower Cryptogams (141211)

P. Pages : 2

Time : Three Hours

Max. Marks : 60

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions carry equal marks.
5. Answer **any four** questions. Any two from each section.
6. Answer to the two sections written in separate answer books.

SECTION - I

1. Give the classification of algae by FE Fritch (1945) up to orders with suitable examples. 15
2. Give an account of thallus organisation, ultrastructure of heterocyst & reproduction in Cyanophyceae. 15
- Describe the life cycle pattern in Rhodophyceae with suitable example. 15
3. Write notes on **any three** 15
 - i) Phycology in India.
 - ii) Colonial thallus.
 - iii) Role of algae as food.
 - iv) Thallus organisation in cyanophyta.
 - v) Asexual reproduction in phaeophyceae.
 - vi) General characters of Euglenophyta.

SECTION – II

4. Give thallus structure, heterothallism & sexual reproduction in zygomycotina. 15
5. Give distinguishing characters, thallus structure & nutrition in fungi. 15

OR

Give distinguishing characters of Ascomycotina. Comment on thallus structure, asci and ascospores in Ascomycotina.

6. Write Notes on any three 15
- Role of fungi as food.
 - Thallus structure in myxomycotina.
 - Hyphal modifications in fungi.
 - Types of lichens.
 - Distinguishing characters of Basidiomycotina.
 - Types of conidia in Deuteromycotina.

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कल्पक - 052



BOT-1.1
Angiosperm Taxonomy
(141111)

P. Pages : 2

Time : Three Hours

Max. Marks : 60

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions carry equal marks.
5. Answer any **four** questions, any **two** from each section.
6. Answer to the two sections should be written in separate answer books.

SECTION – I

1. Describe following families with reference to range of floral variations, taxonomy and evolutionary trends of 15
- a) Orchidaceae.
- b) Ranunculaceae

2. Describe systems of classifications in pre-Darwinian period. 15

OR

Describe the role of embryological data in taxonomy.

3. Write short notes any three. 15
- i) Leaf structure.
- ii) Names of cultivated and hybrid plants.
- iii) Evolution of gynoecium.
- iv) Type method.
- v) Primitive carpel.

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BOT-2.2
Diversity of Higher Cryptogams
(141212)

P. Pages : 2

Time : Three Hours

Max. Marks : 60

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions, two questions from each section.
4. All questions carry equal marks.
5. Answer to the two section should be written in separate answer books.

SECTION - I

1. Write important characters of Bryophyta & give an outline classification of Bryophyta upto order as given by G.M. Smith with suitable example of each. 15
2. Give an account of the general Variations seen in the structure of the sporophyte of Bryophyta. 15

Describe salient features of Calobryales & discuss affinities.

3. Write short notes **any three**. 15
 - i) Economic importance of Bryophytes.
 - ii) Peristome.
 - iii) Amphigastria.
 - iv) Rhizoids and scales.
 - v) Advanced features of Sporophyte of Anthoceros.

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SECTION - II

4. With the help of labelled diagrams give an account of sporophyte of any one water fern. 15
5. Is Psilotales a primitive order? Explain in detail & add a note on their affinities. 15

OR

Write main characteristics of Lycopsida, Sphenopsida & Pteropsida.

6. Write short notes on any three. 15
- i) Heterospory.
 - ii) Economic Importance of pteridophytes.
 - iii) Sorus & types of Sori.
 - iv) Steles in Filicales.
 - v) Eusporangium & Leptosporangium.

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BOT-1.2
Environmental Botany and Biostatistics
(141112)

P. Pages : 2**Time : Three Hours****Max. Marks : 60**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions, taking at least two question from each section.
5. Use separate answer book for each section.
6. Log table and calculator are allowed.

SECTION - I

- | | | |
|-----------|--|-----------|
| 1. | Give the general account of legislation related environment. Explain biodiversity Act (2002) | 15 |
| 2. | What is ecosystem ? Explain aquatic ecosystem. | 15 |
| 3. | Write short notes on any three . | 15 |
| | a) Environmental Auditing. | |
| | b) Social Forestry. | |
| | c) Concept of EIA | |
| | d) Kyoto Protocol. | |
| | e) ANOVA. | |

SECTION - II

4. The weight of six apples are 140, 220, 90, 180, 140, 200 gm respectively. Find (a) The mean (b) The median & (c) The mode. 15
5. What is remote sensing ? Give the definition, concept & history of remote sensing. 15
- OR**
- What is productivity of diff. ecosystem ? Explain primary productivity & secondary productivity. 15
6. Write short notes on **any three**. 15
- a) Sampling method.
 - b) Forest conservation.
 - c) Acid rain
 - d) Type & sources of solid waste.
 - e) Merits & demerits of mean.

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कल्पक - 055



BOT-2.3
Plant Physiology and Biochemistry
(141213)

P. Pages : 1

Time : Three Hours

Max. Marks : 60

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any four** questions taking at least two questions from each section.
5. Answer to the two section should be written in separate answer book.
6. All questions carry equal marks.

SECTION - I

1. Describe different photosynthetic pigments and their role in photosynthesis. **15**
2. Describe redox reactions occur in plant cells. How redox potential is measured? **15**
3. Explain primary metabolites briefly. **15**
4. Write short notes on following **any three**. **15**
 - a) Auxin.
 - b) Application of phenolic compounds.
 - c) Concept of biological clock in plants.
 - d) Fermentation.
 - e) Scope and importance of biochemistry.

SECTION - II

5. What are Terpenoids? How do they originate in plants? Explain its role in herbivory. **15**
6. Define stress. Explain water and temperature stress in plants. **15**
7. Explain mechanism of phloem loading and unloading. **15**
8. Write short notes on following **any three**. **15**
 - a) Gibberellins.
 - b) Alkaloids.
 - c) Circadian rhythms
 - d) pH and buffer
 - e) Cell surface receptors.
