SYLLABUS, TDC-II

RAMESHWAR MAHAVIDYALAYA, B. R. A. B. U, MUZAFFARPUR

BOTANY (Hons.) Paper – III

Time: 3 Hours **Full Marks: 75**

Ten questions to be set, four from Group A and six from Group B, five to be answered, two from Group A and three from Group B.

Group-A

Gymnosperms:

1. Comparative study of the morphological, anatomical, embryological features, economic importance and affinities of Gymnosperms withreferencetothe following taxa- Pinus, Taxus and Gnetum.
2. Fossils – Definition, conditions for fossilization, modes of preservation.
3. Type – Lyginopteris and Cycadeoidea.

Group-B

Angiosperms:

1. Principles of plant taxonomy and knowledge of classifications of parts as proposed by Linnaeus, Bentham and Hooker, Engler and Pranti and Hutchinson.
2. Interactional Code of Botanical nomenclature and its application, Modem trends in plant taxonomy with reference to embryology, cytology and phytochemistry.
3. A comparative account, diagnostic features, floral ranges and relationship of the following families:
   Renunculaceae, Annonaceae, Nyctaginaceae, Apocyanaceae, Polygonaceae, Caryophyllaceae, Euphorbiaceae, Cucurbitaceae, Verbenaceae, Boraginaceae, Lamiaceae, Scrophulariaceae, acanthaceae, Commelinaceae, Cyperaceae, Poaceae, Orchidaceae.
4. Mendelian principles and its modification.

Books:

1. BP Pandey, Taxonomy of Angiosperms (S Chand)
2. Dr V Singh, A text book of botany Angiosperms (Rastogi Pub)
3. PC Vasishta, Botany for degree student Gymnosperms (S Chand)

BOTANY (HONS.) PAPER-IV

(Anatomy, Embryology of Angiosperms & Applied Botany)

Time: 3 Hours **Full Marks: 75**

Ten questions to be set, four from Group A and three each from Group B and C, five to be answered at least one from each group.

Group-A

Anatomy:

1. Organization of root apex and shoot apex.
2. Root-stem transition.
3. Mechanical tissue.
4. Periderm.
5. Organization of tissue in relation to environment (Ecological Anatomy).
6. Anomolous secondary growth in Bignonia, Nyctanthes, Achyranthes, Boerhaavia, Tecoma, Dracaena.

Group-B

Embryology:

1. Various developmetal processes in microsporogenesis, male gametophyte, megasporogenesis, female gametophyte, fertilization, apomixis, endosperm, embryogeny and polyembryony.
2. Importance of anther and embryo culture.

Group-C

1. Important medicinal plants of Bihar.
2. **Systematic position botanical name and economic importance of the following:**

(i). Oil Seeds-Mustard, Sunflower, Linseed, Seasamum and Ground nut.
(ii). Pulses – Gram, Pigeon-peas, green gram (mung), Lentil (Masoor) and Pea.
(iii). Cereals – Rice, Wheat, Barley, Maize and Ragi.
(iv). Fruits – Litchi, Mango, Banana, Guava and Makhana.
(v). Vegetables – Potato, Brinjal, Cauliflower, Spinach and Ladies finger.
(vi). Timber – Teak, Sal, Sisham, Jamun, Mahogani.

3. Principles of plant tissue culture and its significance.
4. Biogas and its importance.

Books:

1. Dr V Singh, Embryology of Angiosperms (Rastogi Pub)
2. U Sinha, Cytogenetics, Plant breeding and evolution (Vikas Publication House)
3. Dr V Singh, Economic Botany (Rastogi Pub)
4. HH Haines, The Botany of Bihar and Orissa (Bishen Singh Pub)
5. Praveen Kr Saxena, Molecular Pant breeding (Campus Book International)
6. Arthur J Eames, An introduction to Plant Anatomy (Tata Mcgraw Hill Pub)

PRACTICAL

Time: 6 Hours **Full Marks: 50**

1. Study of the living and fossil Gymnosperms. (Vegetative and reproductive parts). 4 Marks
2. Description and identification of an angiospermic plant up to genus only from the families prescribed in the course.
3. Embryo dissection, stigma squashing. 4 Marks
4. Identification of plants of economic importance. 4 Marks
5. Internal anatomy of primary and secondary (Both normal and abnomal) of angiospermic plants. 8 Marks
6. Comment upon five spots. 10 Marks
7. Class record and field work. 7 Marks
8. **Viva-voce** 5 Marks

It will be obligatory on the part of the students to take part in excursion and field works.

Books:

1. BP Pandey, Modern Practical Botany (Vikas Publishing House)
2. Dr Ashok M Bendre, A text book of practical Botany (S Chand)

BOTANY (SUBSIDIARY)

(Angiosperm, Plant Physiology & Environmental Biology)

Time: 3 Hours **Full Marks: 75**

Angiosperms:

(A). Morphology and Taxonomy:

(i). Importance of classification of angiosperms with reference to thesystems ofBentham and Hooker and Hutchinson.

(ii). Binomial nomenclature.

(iii). A Comparative account of the diagnostic features and economic importance of the following families Ranunculaceae, Convolvulaceae, Myrtaceae, Cucurbitaceae, Euphorbiaceae, Asclepiadaceae, Acanthaceae, Polygonaceae Verbenaceae, Scorophulariaceae, Musaceae and Poaceae.

(B). Anatomy:

(i). Tissue and tissue systems.
(ii). Meristems.
(iii). Organisation of tissues in relation to environment.
(iv). Initiation and activity of cambium including abnormal secondary growth in stems of Amaranthus, Nyctanthes and Tinospora.

(C). Embryology:

Life-cycle of a typical flowering plant, development of pollen ovule and embryo sac. fertilization,endosperm and embryo.

1. Plant Physiology:

(i). Protoplasm - Physical and Chemical nature.
(ii). Osmosis - OP, DPD, TP and WP, Permeability, Plasmolysis.
(iii). Water relation - Absorption, Ascent of sap and Transpiration.
(iv). Enzymes - Nature and properties.
(v). Photosynthesis-Photophosphorylation, Calvin cycle andfactorsaffecting photosynthesis.
(vi). Respiration-Glycolysis,Krebscycle and Factors affecting respiration.
(vii). Phytohormones - Auxins and Gibberellins.
(viii). Photoperiodism.

2. Environmental Biology:

(i). Ecological factors.
(ii). Plant communities & ecosystem
(iii). Succession (Hydrosphere&Zerosphere)
(iv). Pollution (Water and Air).

Books:

1. BP Pandey, Taxonomy of Angiosperms (S Chand)
2. Dr V Singh, A text book of botany Angiosperms (Rastogi Pub)
3. Dr V Singh, Embryology of Angiosperms (Rastogi Pub)
4. Arthur J Eames, An introduction to Plant Anatomy (Tata Mcgraw Hill Pub)
5. SN Pandey, Plant Physiology (Vikash Publication House)
6. PD Sharma, Environmental Biology and Toxicology (Rastogi Pub)
7. Prof PR Trivedi, Environmental Biology (Akashdeep Publishing House)

PRACTICALS

Time: 6 Hours **Full Marks: 25**

1. Description, diagnostic feature and identification of the plants belonging to the families included in the syllabus. **5 Marks**
2. Section cutting, staining and temporary microscopic preparation of angiospermic stems of normal and abnormal structures. **5 Marks**
3. Comment upon simple physiological experiments included in the syllabus. **5 Marks**
4. To identify and comment upon five spots. **5 Marks**
5. Practical record. **5 Marks**

Books:

1. BP Pandey, Modern Practical Botany (Vikas Publishing House)
2. Dr Ashok M Bendre, A text book of practical Botany (S Chand)

BOTANY (GENERAL)

Time: 3 Hours **Full Marks: 75**

Plant physiology & biochemistry:

1. Physiology of water and mineral absorption.
2. Transpiration - Stomatal moement.
3. Mineral nutrition of the plants - Role of macro nutrients.
4. Enzymes - Nature, mode of action, factors affecting enzyme activity.
5. Photosynthesis - Mechanism and factors.
6. Respiration - Aerobic and anaerobic (Glycolysis Kreb's cycle and electron transport).
7. Nitrogen metabolism; Nitrate reduction, amino acids, protein- Structure and types, Symbiotic and asymbiotic nitrogen fixation.
8. Phytohormones - Auxins and Gibberellin (discovery, structure and roles).
9. Growth - Measurement, factors affecting growth, role of light, temperature and humidity.
10. Movements - General Account.

Group-B

Microbiology:

1. A general account of bacteria, viruses and their economic importance.
2. Role of microbes in agriculture and industry.
3. **Important plant diseases of Bihar**
   Etiology, Symptoms and Control of the following -
   (i). Late blight of potato
   (ii). Rust of Wheat.
   (iii). Red rot of sugarcane
   (iv). Tobacco mosaic virus.

Books:

1. SN Pandey, Plant Physiology (Vikash Publication House)
2. VK Sharma, Essentials of Microbiology (Pearls Books)
3. PD Sharma, Microbiology (Rastogi Pub)
4. Albert L Lehninger, Principle of Biochemistry (CBS Publisher)
5. HS Srivastava, Element of Biochemistry (Rastogi Pub)