



Baba Ghulam Shah Badshah University Raipuri (J&K)

University Notification No. 06 of 2018, dated: 3-7-2018

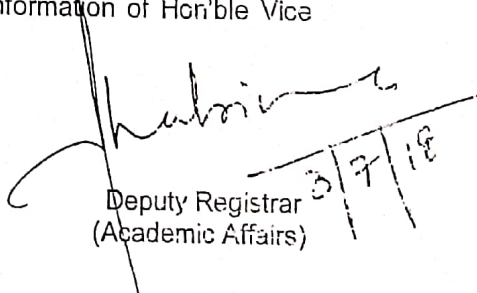
As approved by Hon'ble Vice Chancellor in anticipation of confirmation by Academic Council, the Course Structure and Syllabi of M.Phil. Arabic, Botany, Computer Science, Economics, English & Zoology for semester 1st and pre-Ph.D. in Arabic, Botany, Computer Science, English, Economics, Islamic Studies, Education, Mathematics, Management Studies, Urdu, Biotechnology, Zoology and Electrical Engineering are hereby notified for information of all the concerned. The validity of the above syllabi is for a period of one year i.e. 2018.

Sd/-
Registrar

No. BGSEU/Acad/18/123
Dated: 3-7-2018

Copy to:

1. Dean Academic Affairs
2. Controller of Examinations
3. Dean, School of Mathematical & Computer Sciences
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15. Head, Department of Electrical & Renewable Energy Engineering
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Deputy Registrar
(Academic Affairs)

3/7/18

Pre Ph. D (Botany) Examination -2018

Course Code: Pre Ph. D Bot - 01

Maximum Marks: 100

Course Title: Research methodology and techniques

Duration of Exam: 3 hours

Credits: 04

Unit 1: Basics of research methodology

- 1.1 Introduction: meaning and definition, objectives of research, types of research.
- 1.2 Research problem: definition, necessity and techniques of defining research problems, formulation and objectives of research problem.
- 1.3 Research design: meaning, need and features of good research design; types of research design, basic principles of experimental design (RBD and CRD).
- 1.4 Thesis writing: Manuscript preparation, Citation style; Introduction to SPSS (Statistical Package for Social Science).

Unit 2: Survey and documentation

- 2.1 Methods of survey: physiognomic, phytosociological and grid methods; advantages and disadvantages.
- 2.2 Sampling methods: introduction and types, Sampling designs: census and sample survey, their characteristics and techniques.
- 2.3 Field Techniques: Herbarium preparation: collection, recording information, pressing, poisoning, drying, and preservation of herbarium specimens.
- 2.4 Presentation and interpretation of field data, Forest mapping and change detection using Remote Sensing and GIS.

Unit 3: Microscopy and Spectroscopy

- 3.1 Principles and application of light, Phase-contrast and Fluorescence Microscopy.
- 3.2 Principles, working and application of Scanning and Transmission Electron Microscopy.
- 3.3 Principles, working and application of UV – Visible Spectroscopy.
- 3.4 Principles, working and application of Atomic Absorption and Plasma Emission Spectroscopy.

Unit 4: Electrophoresis and Chromatography

- 4.1 Types of Electrophoresis: Agarose, SDS–PAGE(2D,3D), electrofocussing and factors effecting electrophoretic mobility.

- 4.2 Principles and methodology of Chromatography-Gas-Liquid, HPLC & GCMS.
- 4.3 Principles and application of Gel filtration, Ion exchange and affinity chromatography
- 4.4 Flow cytometry –application, instrumentation and merits.

Unit 5: DNA extraction methods and Culture techniques

- 5.1 Plant total DNA extraction CTAB protocol; Quantification of DNA.
- 5.2 Molecular markers: RFLP, AFLP, RAPD, SSR's. Polymerase Chain Reaction, PCR Sequencing.
- 5.3 Culture techniques–Media preparation; (PDA, Nutrient Agar, Muller Hinton Agar) Isolation, purification and maintenance of microorganisms,
- 5.4 Plant tissue culture–MS medium, Gamborg medium; Sterilization Techniques: physical and chemical.

Note for paper setter: The question paper will have 10 questions, two from each unit. The candidate will be required to attempt five questions in all, selecting one from each unit. Each question carries equal marks.

Books recommended:

1. Creswell, J. W. (2014). Research design: Qualitative, quantitative and mixed methods approach. SAGE Publications Inc.
2. Gardiner, W. P. (1997). Statistics for the Biosciences. Prentice Hall.
3. Hames, B. D. (1998). Gel electrophoresis of proteins – a practical approach. Oxford University Press.
4. Moore, P. and Cobby, J. (1998). Introductory Statistics for Environmentalists. Prentice Hall.
5. Wilson, K. and Walker, J. (2006). Principles and techniques of Biochemistry and molecular Biology (6th Ed.). Cambridge.

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2/4/18

Pre Ph. D (Botany) Examination -2018

Course Code: Pre Ph. D Bot - 02

Course Title: Modern Biology

Credits: 04

Maximum Marks: 100

Duration of Exam: 3 hours

Unit 1 Plant Molecular Systematics

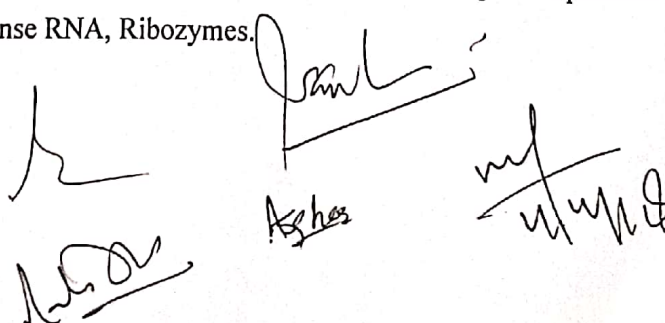
- 1.1 Acquisition of molecular data: DNA sequence data, Polymerase Chain Reaction, DNA Sequencing reaction, Types of DNA sequence data.
- 1.2 Restriction site analysis: Restriction Fragment Length Polymorphism, Allozymes, Microsatellite DNA.
- 1.3 Random Amplified Polymorphic DNAs (RAPD) and Amplified Fragment Length Polymorphism (AFLP)
- 1.4 Modern approaches used in the classification; Biopiracy vis-à-vis IPR regime and its role to check biopiracy, barcoding and its application in checking biopiracy.

Unit 2 Stress Physiology

- 2.1 Salinity stress: effects on growth and photosynthesis of plants; various adaptations of Plants to avoid and overcome salinity stress (ion homeostasis and salt tolerance).
- 2.2 Water deficit: effects of water deficit on plant growth and development, resistance to water deficit (avoidance and tolerance), stomatal signaling during water stress and role of ABA.
- 2.3 Heavy metal toxicity: effects of heavy metals on plants, mechanism of heavy metal detoxification, role of phytochelatins in heavy metal stress tolerance.
- 2.4 Ozone toxicity; effects of ozone on plants, ozone tolerance mechanisms in plants.

Unit 3 Advance Biological Chemistry and Biotechnology

- 3.1 Protein- Structure and function; Flexibility of Protein structure, Stability of folded confirmation. Protein allosterism.
- 3.2 Mechanism of protein folding- different models and Folding Funnel Model, Introduction of proteomics technology, Protein Microarrays- Introduction and applications.
- 3.3 Chemical synthesis and sequencing of DNA: The phosphoramidite method, Dideoxynucleotide procedure, Primer walking and pyrosequencing, Ligation sequencing
- 3.4 Functional genomics- Microarray technology, Serial analysis of gene expression, Metagenomics, Antisense RNA, Ribozymes.



Unit 4 Plant transformation techniques

- 4.1 *Agrobacterium* – mediated genettransfer in plants for development of transgenics.
- 4.2 Virus infected gene silencing (VIGS), plant viruses as non – integrative vectors.
- 4.3 RNA plant viruses as vectors, mono – partite viruses.
- 4.4 Direct methods of gene transfer in plants: particle bombardment, electropolation, microinjection, liposome – mediatedtransformation, silicon carbide fibre – mediated transformation.

Unit 5 Plant Biotechnology for value addition

- 5.1 Biotechnology in enhancing photosynthesis and improving fruit ripening.
- 5.2 Golden rice: nutritionally improved rice through biotechnology, termination gene technology.
- 5.3 Metabolic engineering (an overview), improving the value of ornamental plants (variations in flower colour through gene manipulation, senescence).
- 5.4 Bioplastics: biodegradable plastic from plants through biotechnological interventions.

Note for paper setter: The question paper will have 10 questions, two from each unit. The candidate will be required to attempt five questions in all, selecting one from each unit. Each question carries equal marks.

Books recommended:

1. Odum, E.P. and Garry, W. Barret (2004). Fundamentals of Ecology. 5th edition.
2. Helgi O. and Stephen, A. Rolfe (2005). The Physiology of Flowering Plants – 4TH edition. Cambridge University Press.
3. Michael Simpson (2010). Plant Systematics. 2nd Edition. Academic Press.
4. Taiz, L. and Zeiger, E (1998). Plant Physiology. 2nd Edition, Sinauer Assosiation, Inc. Publisher, Sunderland, Massachusetts, USA.
5. Glick, R. B, Pastermak, J.J and Patten, C.L. (2010). Molecular Biotechnology- Principles and applications of Recombinant DNA. 4TH Ed. ASM Press, Washington, DC.
6. Elliot, W. H and Elliot, D.C. (2009). Biochemistry and Molecular Biology. 4th Ed. Oxford University Press, New York.
7. Stanburry, P.F., Whitaker, A. and Hall, S. J (2008). Principles of Fermentation Technology. 2nd edition. Elsevier Publications, Delhi.

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4/4/18

Pre Ph.D. (Botany) Examination -2018

Course Code: Pre-Ph.D. Bot - 03
Course Title: Origin, evolution and
utility of plant resources
Credits: 04

Maximum Marks: 100
Duration of Exam: 03 hours

Unit 1: Ethnobotany: concepts and role

- 1.1 Ethnobotany: concept, scope, objectives and importance.
- 1.2 Tools/means for ethnobotanical studies: Ethnic human settlements, field works, Herbarium, ancient literature, archaeological findings, temple and sacred places.
- 1.3 Role of ethnobotany in primary healthcare programmes and development of new Drugs; role of ethnobotany in plant conservation and protection.
- 1.4 Ethnobotany of major tribal communities of Jammu And Kashmir: Gujjars, Bakerwals and Paharies.

Unit 2: Plants: Origin, domestication and improvement

- 2.1 Prehistoric plant human interactions; discovery of plant use to humans, hunter-gathering to practice of agriculture. Ethnobotanical studies during 19th and 20th centuries.
- 2.2 Concept of centres of origin of plants: Vavilovian, primary and secondary; Centres of origin of maize, coffee, cotton and sugarcane.
- 2.3 Domestication of crop plants; beginning, dissemination and spread of agriculture; domestication and evolution of crop plants.
- 2.4 Plant improvement: development of improved agricultural crops through plant breeding; evolution of high yielding crop varieties through genetic engineering.

Unit 3: Plant resources: Utility to communities

- 3.1 Food supplements: *Hippophae rhamnoides*; *Phyllanthus embelica*; Spices and condiments: *Crocus sativus* and *Bunium persicum* (distribution, botany, classification, parts used, method of use and nutritive value).
- 3.2 Sources of beverages: non-alcoholic and alcoholic (*Camellia sinensis*) and *Vitis vinifera*; Fodder: *Grewia optiva* and Fibre: *Chorchorus capsularis* (distribution, botany, classification, part used and durability)
- 3.3 Timbers: *Pinus roxburghii* and *Tecton grandis*; Less used colouring matter: *Punica granatum*, *Reinwardtia indica* (distribution, botany, part used and commercial importance).
- 3.4 Medicines: *Taxus baccata* subsp. *wallichiana*, *Podophyllum hexandrum*; Aromatic oils (*Thymus serpyllum* and *Lavandula angustifolia*); Bio-sweeteners (*Stevia rebaudiana* and *Glycyrrhiza glabra*); Bio-gums (*Caesalpina spinosa*, *Trigonella*