INTRODUCTORY REGULATORY COURSE

There will be two group of questions. Group A is compulsory which will contain three questions. Question No. 1 will be very short answer type consisting of five questions of 1 mark each. Question No. 2 & 3 will be short answer type of 5 marks each. Group B will contain descriptive types six questions of fifteen marks each, out of which any four questions have to be answered.

(Credit : Theory-3)

Lecture 45

Full marks : 75 **Time: 3Hrs.**

1. Scope of Botany and five kingdom classification with special emphasis on Plantae. (4 classes)

- General characteristic Features of Thallophyta, Bryophyta, Pteridophyta, Gymnosperm and Angiosperm.

2. Biodiversity and its conservation. (3 classes)

- Definition, levels of biodiversity, importance and methods of biodiversity conservation.

3. Botanical name, family and uses of medicinal plants. (4 classes)

i. Sarpagandha ii. Ashvagandha iii. Brahmi iv. Aloe vera v. Amla. vi. Tulsi vii. Neem viii. Turmeric ix. Garlic x. Giloy

4. Ecosystem (4 classes)

- Basic concept, components of ecosystem, types, structural and functional components of ecosystem, food chain and food web, ecological pyramid.

- Environmental issues: Greenhouse effect, global warming, eutrophication, algal bloom, photochemical smog.

5. Basic idea of plant tissue culture and its applications. (4 classes)

- History, Basic requirements of tissue, technique, prospect and application.

6. Plant water relationship (3 classes)

- Osmosis, Diffusion, Inhibition, Water potential, Plasmolysis.

7. Transpiration (3 classes)

- Brief idea about Transpiration and Guttation.

- Stomatal opening and closing.

8. Photosynthesis (3 classes)

- Brief idea about Photosynthesis- Light reaction.

9. Respiration (3 classes)

- Brief idea about respiration- Glycolysis.

10. Cell Biology (5 classes)

- Prokaryotes and Eukaryotes, Cell division- Mitosis and Meiosis.

11. Biomolecules (4 classes)

- Nucleic acid (DNA and RNA), Protein (Chemistry and structure).

12. Genetics (5 classes)

- Mendel's law of inheritance, co dominance, incomplete dominance.

Suggested Readings

1. Singh,V., Pande, P.C. and Jain, D.K.,(2018) A textbook of Botany, Rastogi Publications.
2. Sharma, P.D (2017): Ecology and Environment, 13th Edition, Rastogi Publications, Meerut
3. Hosetti, B. B and Ramkrishna, S. (2016): Biodiversity- Concepts and Conservation, Aavishkar Publishers, Distributors,Jaipur
4. Patro, L. (2016): Biodiversity Conservation and Management, Discovery Publishing Pvt. Ltd.
5. Singh,V., Pande, P.C. and Jain, D.K.,(2018), Economic Botany, 3rd Edition, Rastogi Publications
6. Kochlar, S.L.,(2016): Economic Botany- A Comprehensive Study,5th Edition, Cambridge University Press India Pvt. Ltd.
7. Odum, E.P and Barrett, G.W., (2017) Fundamentals of Ecology, 5th Edition, Cengage Learning, New Delhi
8. Shukla, R.S. and Chandel, P.S (2016): A text book of Plant Ecology, S. Chand & Company Pvt. Limited
9. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory andPractice. Elsevier Science Amsterdam. The Netherlands.
10. Dubey, R.C. – 2015, A. Text book of Biotechnology, S. Chand & Co. Pvt.Ltd- New Delhi.
11. Hopkins, W.G. and Huner, A.(2008). Introduction to Plant Physiology. JohnWiley and Sons. U.S.A. 4th edition.
12. Taiz, L., Zeiger, E., Muller, I.M and Murphy, A. (2015). Plant Physiology and development. Sinauer Associates Inc. USA 6th edition.
13. Bhattacharya D. (1999). Experiments in Plant Physiology-A LaboratoryManual, Narosa Publishing House, New Delhi.
14. Powar, C.B (2002): Cell Biology, Himalayan Books.

15. Karp, G. (2010), Cell Biology, John Wiley & Sons, U.S.A. 6th edition.
16. Hardin, J., Becker, G., Skliensmith, L.J, (2012), Becker's World of the Cell, Pearson Education Inc. U.S.A. 8th edition.
17. Cooper, G.M, and Hausman, R.E. 2009 The Cell: A Molecular Approach, 5thedition, ASM Press & Sunderland, Washington, D.C, Sinauer Associates, MA.
18. Becker, W.M, Kleinsmith, L.J., Hardin, J. and Bertoni, G.P. (2009): The Worldof the cell, 7thedition, Pearson Benjamin Cummings Publishing, San Francisco.
19. Gardner, E.J., Simmons, M.J., Snustad, D.P. (1991). Principles of Genetics. John Wiley & sons. India 8th edition.
20. Snustad, D.P. and Simmons, M.J. (2010) Principles of Genetics, John Wiley & Sons, Inc., India. 5th edition.
21. Klug, W.S., Cummings, M.R., Spenner. C.A. (2012). Concepts of Genetics. Benjamin Cummings, USA. 10th edition.
22. Griffiths, A.J.F, Wessler, S.R., Carroll, S.B., Doebley. I. (2010). Introduction to Genetic Analysis. W.H. Freeman and Co., U.S.A., 10th edition.
23. Gupta, P.K (2018): Genetics, Rastogi Publications

Semester – I

MJ-01. Microbiology, Fungi and Plant Pathology

(Credit course: Theory- 04, Practical- 02)

There will be two group of questions. Group A is compulsory which will contain three questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No. 2 & 3 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any three are to be answered.

THEORY
Lectures 60

Full marks: 60 **Time: 03 Hrs.**

UNIT 1: VIRUSES (4 classes)

Discovery, living & non-living characterization, general structure with specialreference to bacteriophage and TMV.

UNIT 2: BACTERIA, CYANOBACTERIA AND MYCOPLASMA (5 classes)

Discovery, general characteristics and cell structures

UNIT 3: INTRODUCTION TO TRUE FUNGI (5 classes)

Definition, General characteristics and Classification by Ainsworth.

UNIT 4: MASTIGOMYCOTINA (5 classes)

General account and Life cycle of *Synchytrium*

UNIT 5: ZYGOMYCOTINA (5 classes)

General characteristics and Life Cycle of *Mucor*

UNIT 6: ASCOMYCOTINA (5 classes)

General characteristics and life cycle of *Peziza.*

UNIT 7: BASIDIOMYCOTINA (5 classes)

General characteristics and life cycle of *Puccinia*.

UNIT 8: DEUTEROMYCOTINA (5 classes)

General characteristics and Life cycle of *Alternaria.*

UNIT 9: SYMBIOTIC ASSOCIATIONS (5 classes)

Lichen – Occurrence; General characteristics; types and Economic Importance.

UNIT 10: APPLIED MYCOLOGY (3 classes)

(Application of fungi in food industry (enzymes, antibiotics); IPM and Biopesticides.

UNIT 11: Introduction and classification of diseases, General symptoms of plantdiseases, stages in the development of disease and various control measures of plant diseases **(5 classes)**

UNIT 12: General symptoms; etiology and control of following diseases- **(8 classes)**

1. Citrus canker
2. Red rot of sugarcane
3. Early blight of potato
4. White rust of crucifers
5. Late blight of potato
6. Little leaf of brinjal
7. Loose smut of wheat

Suggested readings

1. Pelczar, M.J, (2001) Microbiology, 5th edition, Tata McGraw-hill co, New Delhi.
2. Sharma,P.D.(2014) Microbiology. Rastogi Publication, Meerut
3. Agrios, G.N. 1997 Plant Pathology, 4th edition, Academic Press, U.K
4. Alexopoulos, C.J., Mims, C.W, Blackwell, M. (1996). Introductory Mycology, John Wiley & Sons (Asia) Singapore, 4th edition.
5. Webster, J. and Weber, R. (2007), Introduction to Fungi, Cambridge University Press, Cambridge, 3rd edition.
6. Sethi, I.K. and Walia, S.K.(2011). Textbook of Fungi and their Allies, Macmillan Publishers India Ltd.
7. Sharma, P.D, (2011), Plant Pathology, Rastogi Publication, Meerut, India
8. Pelzar. M.J. J R. Chen E.C.S. Krieg, N.R (2010) Microbiology- An application based approach, Tata MC Graw Hill Education Pvt. Ltd. New Delhi
9. Tortora, G.J. Funke, B.R. Case, C.L. (2007), Microbiology, Pearson Benjamin Cummings, San Francisco, U.S.A. 9th edition

PRACTICALS

Microbiology

1. Structure of Bacteriophage and TMV by photographs.
2. Forms of Bacteria by slides/photographs.
3. Gram staining technique.

Fungi

1. *Synchytrium*: study of asexual stage from temporary mounts and sexualstructures through permanent slides
2. *Peziza* : section through ascocarp.
3. Temporary slides of spores of *Puccinia*, *Alternaria*, *Mucor*

Plant Pathology

1. Local trip for identification of various diseases with disease name, host nameand causal organisms (included in syllabus)
2. Preparation of herbarium for the various diseases (included in syllabus)
3. Study of all diseases through permanent slides
4. Temporary slides preparation of early blight of potato, late blight of potato andwhite rust of crucifer.

Practical examination
Full marks: 25 **Time: 03 Hrs.**

1. Preparation of temporary slides of any one fungus/fungal disease included in the syllabus. 06 marks
2. To detect the gram positive and gram negative bacteria through gram staining technique.
   Or Structure of bacteriophage and TMV through photographs 06
3. Spotting (2 x2 marks) 04 marks
4. Viva voce 04 marks
5. Class records/ Model/ Chart. 05 marks