Q. III Descriptive Answers

21. From Unit 1: Cell Biology: 01 sub question. 1 X 10 = 10

OR

From Unit 2: Morphology of Chromosomes-01 sub question.

22. From Unit 3: Cell division: 01 sub question. 1 X 10 = 10

OR

From Unit 4: Genetics: 01 sub question.

23. From Unit 4: Genetics: 01 sub questions. 1 X 10 = 10

OR

From Unit 5: Evolution: 01 sub question.

B.Sc VI semester

(w.e.f 2016 -17)

Botany paper -II

(Molecular Biology, Biotechnology & Immunology)

50 hrs

Objectives: - Molecular Biology, Biotechnology and Immunology has some recent trends in the concern fields. This will help students to pursue research in concerned fields.

Unit I: Nucleic Acids: DNA & RNA, occurrence, types and chemical compositions,

Experimental evidences for DNA as genetic material. Structure of DNA, Replication, semiconservative method, RNA and types, post transcription changes.

10 Hrs.

Unit 2: Gene Expression: Gene concept, Genetic code & protein synthesis. Regulation of gene expression in prokaryotes & eukaryotes.

08Hrs.

Unit 3: Recombinant DNA technology and Bioinformatics:

Enzyme, vector (plasmid PBR 322), marker gene, Steps of cloning technique, PCR and its application, Genomic DNA and cDNA library. Brief concept on Genomics and proteomics.

08 Hrs.

Unit 4: Biotechnology and Genetic engineering of plants:

Basic concepts, principles and scope. Aims, strategies for development of transgenic plants (with suitable example). Agrobacterium-The natural genetic engineer. T-DNA and transposon mediated Gene tagging, intellectual. Property rights, possible ecological risks and ethical concerns.

12Hrs.

Unit 5: Microbial genetic manipulation and Immunology:

Microbial genetic manipulation: Bacterial transformation, selection of recombinant and transformants, genetic improvement of industrial microbes, nitrogen fixers & fermentation technology.

Immunology: Immuno-systems, Immunotechniques in Agriculture. ELISA method to detect Plant diseases & Monoclonal antibodies.

12 Hrs.

Practicals:

1. DNA estimation by DPA diphenyl amine method.
2. RNA estimation by orcinol method.
3. Extraction and estimation of protein from plant source.

   1) Salt precipitation method 2) solvent method
4. Culturing of Rhizobium-YEMA media.
5. Culturing of Azatobacteria-ASHBY'S media.
6. Demonstration of Electrophoresis technique
7. Agarose gel electrophoresis.
8. Demonstration and comparison of GM Plants with Non GM Plants (BT- Cotton, BT-Brinjal, BT Tomato).
9. Visit to Biotechnology Research Laboratory.

Suggested Reading:

1. Cell & Molecular Biology -- By E.D.F. De Robertis -- ISE Publication
2. Basic Biotechnology -- Colin Rateledge & Bjorn Kristianses -- Cambridge Uni. Press.
3. A Text Book of Biotechnology – R.C. Dubey – S. Chand Publication
4. Cell Biology, Genetics Molecular Biology, Evolution & Ecology -- P.S. Verma & V. K. Agarwal
5. Casida L.E. (1984)- Industrial Microbiology, Wiley Easterbs, New Delhi.
6. Roitt- Immunology
7. Kubey – Immunology.
8. Fatima – Immunology

B.Sc. VI Semester

Practical Paper-II

(Molecular Biology, Biotechnology & Immunology)

Time: 4 Hours **Max Marks: 40**

Q.1.	Estimation of DNA/RNA from the given sample **A**.	10 Marks
Q.2.	Estimation of Protein from the unknown sample B.	10 Marks
Q.3.	Identify and comment **C** and **D**.	5 Marks
	Project report submission and Viva voce.	10 Marks.
	Journal.	05 Marks

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