M.Sc Biotechnology FIRST YEAR
(ALL QUESTIONS ARE COMPULSORY, EACH QUESTION CARRIES 10MARKS)
Note: Submit online lab record to email- cdlassignments@gitam.edu
Last date to submit is 15-Dec-2021

Lab – I: SPDBT111 - Biochemical Analysis and Techniques

1. (a) Why protein determination is important? State various methods of protein determination.
   (b) Explain about estimation of protein by Lowry method. Clearly write all the objectives, principle, reagents required and experimental procedure.

2. Explain about estimation of ascorbic acid by 2,6-Dichlorophenol indophenol method. Clearly write all the objectives, principle, reagents required and experimental procedure.

3. Explain about various colour reactions of amino acids? Explain the procedure to be followed to carry out qualitative analysis of amino acids.

4. What is chromatography? Explain about experimental procedure for the separation of amino acids by paper chromatography method.

5. Explain the experimental procedure for ultra violet absorption spectra of nucleic acids. Clearly write all the objectives, principle, reagents required and experimental procedure.

6. Explain about estimation of cholesterol by Zak's method. Clearly write all the objectives, principle, reagents required and experimental procedure.

Lab – II: SPDBT112-Microbiology and Immunology

1. Explain the procedures for analyzing morphology of bacteria by spore staining method. Clearly write all the objectives, principle, reagents required and experimental procedures.

2. What is bacterial motility? Explain the procedure to examine the presence of microbes in milk and relate it to the quality of the milk.

3. What are antibiotics used for? Explain the procedure to analyse the concentration of antibiotics of bacterial strain.

4. Explain the procedure to determine the oligodynamic action of copper. Clearly write all the objectives, principle, reagents required and experimental procedures.

5. What is doubling time of bacteria? Explain the procedure to determine the doubling time and log phase of E.coli culture.

6. What is thallus? Explain about fruiting bodies of algae and fungi. Explain the procedure for microbial examination of thallus.

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Lab-I : SPDBT 211-Molecular Biology & Genetic Engineering

1. (a) What are plasmids? Explain the procedure for isolation of plasmid DNA. Clearly write all the objectives, principle, reagents required and experimental procedures.
   (b) Explain the experimental procedure for isolaton of genomic DNA. Clearly write the objectives, principle, reagents required and experimental procedures.

2. (a) Write the protocols required for the isolation of genomic DNA. How to isolate eukaryotic DNA from human blood? Clearly write the principle, reagents required and experimental procedure.
   (b) Explain the procedure to estimate the DNA by Diphenylamine method. Clearly write the principle, reagents required and experimental procedure.

3. (a) What is hypochromic effect? Explain about experimental procedure for finding DNA denaturation and percentage of hypochromicty. Clearly write the principle, reagents required and experimental procedure.
   (b) Explain about restriction digestion of plasmid DNA. Clearly write the principle, reagents required and experimental procedure.

4. (a) What is the function of restriction enzyme? Explain the experimental procedure for separation and identification of restricted DNA fragments by agarose gel electrophoresis.
   (b) Explain the procedure for elution of DNA from agarose gels.

5. (a) What do you mean by ligation of DNA fragments? Clearly write the principle, reagents required and experimental procedure.
   (b) Explain the experimental procedure for amplification of DNA by PCR.

6. (a) What is RNA? How RNA is isolated from total yeast cells. Explain the procedure for estimation of RNA present in the sample using orcinol reagent.
   (b) Explain the principle involved in bacterial transformation. Clearly write reagents required and experimental procedure.

Lab-II: SPDBT 212- Plant and Industrial Biotechnology

1. (a) What is nutrient medium? Explain the procedure for preparing solutions required for Murashige and Skoog medium.
   (b) Develop the protocol for micropropagation of potato.
2. Explain about callus culture of maize. Develop the protocol for the callus culture from carrot cambial tissue. Cleary write all the materials required, procedure and precautions.
3. (a) What is organogenesis? Explain the experimental procedure for regeneration of plants through organogenesis.
   (b) Develop the protocol for the anther culture and productionof haploids.
4. Explain the experimental procedure for the enzymatic isolation of protoplasts from cell sof higher plants using simulnateous or one step method.
5. What is immobilization of enzymes? Explain procedure for immobilizaion of cells by sodium alginate beads method. Cleary write principle, materials required, enzyme assay and procedure.
6. (a) What is protease enzyme? List out various uses of proteage enzyme. Explain the experimental procedure for the production of protease in batch fermentation process.
   (b) Also explain about citric acid production using *Aspergillus niger*. Clearly write all the objectives, principle, reagents required, preparation of assay and experimental procedures.