

N.B. All questions are compulsory

Numbers to the right indicate marks

Draw neat labeled diagram wherever necessary

Duration: 2. . hours

Total marks: 60

Q.1 Answer **any four** of the following

16

- a. Diagrammatically explain how phosphodiester bonds link successive nucleotides in nucleic acids.
- b. Distinguish between B and Z forms of DNA.
- c. Diagrammatically explain the Avery-MacLeod-McCarty experiment.
- d. Write a note on the unusual structures adopted by DNA.
- e. With the help of a neat and labeled diagram, explain the denaturation of Double helical DNA.
- f. How is DNA damage caused by nitrous oxide and alkylating agents?
- g. Differentiate between eukaryotic and prokaryotic chromosomes.
- h. Justify : Adenine nucleotides are components of many enzyme cofactors.

Q.2 Answer **any four** of the following

16

- a. Give a detailed account of lipid extraction and estimation using Soxhlet method.
- b. Diagrammatically explain the Leibeg's method for estimation of elemental Carbon.
- c. Mention the different methods used for quantitative estimation of nucleic acids and explain any one method in detail.
- d. Write a note on the detailed principle and applications of Adsorption chromatography.
- e. State the macromolecular composition of the cell along with the functions of respective macromolecules.
- f. Describe the Dumas method of nitrogen estimation.
- g. Explain in detail Agarose gel electrophoresis.
- h. Elaborate on the principle and working of Gas-Liquid Chromatography.

Q.3 Answer **any four** of the following

16

- a. Justify : Taxonomy is a reliable tool for biological classification.
- b. What are phylogenetic trees ? Discuss the special types of phylogenetic trees in detail.
- c. Write a short note on FAME.
- d. Discuss in brief DNA profiling as a molecular method of analysis.
- e. Elaborate on the role of Morphological, physiological and biochemical characteristics as tools in classification.
- f. Explain in detail the Cavalier Smith system of classification.
- g. Distinguish between genotypic and phylogenetic classification systems.
- h. Write a note on Bergey's Manual of Determinative Bacteriology.

Q.4 Answer **any six** of the following

12

- a. Give the general structure of a nucleotide.
- b. State the function of a) mRNA b) rRNA
- c. State two properties of Watson and Crick model of DNA.
- d. What is DNA methylation?
- e. Write the reaction involved and absorption maxima in the DNSA method of sugar estimation?
- f. Describe any two types of HPLC systems.
- g. State any two standard matrix-ligand systems of affinity chromatography and write their uses.
- h. State the role of potassium sulfate and mercury in Kjeldahl method.
- i. Define : a) Species b) Strain
- j. State any two characteristics of the kingdom Chromista.
- k. Define : a) Rooted phylogenetic tree b) Bifurcated phylogenetic tree
- l. Give the full form of VBNC. What type of culture media are used for their isolation ?