Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
End Semester Examination (ODD Semester) Winter-2022
Shri Shivaji Education Society Amravati's
Science College Congress Nagar Nagpur
B.Sc I Semester I
BIOTECHNOLOGY PAPER – II: MACROMOLECULES

Time: 3 Hrs. **Max. Marks**: 50

Note: 1) All questions are compulsory.
2) All questions carry equal marks.

Q. 1. Describe concept of Prokaryotic gene and Eukaryotic gene. 10

OR

(a). Write a note on α-helix. 5
(b). Write a note on structure of t-RNA 5

Q. 2. Describe forces stabilizing Quaternary structure of Proteins. 10

OR

(a) Write a note on structure of t-RNA 5
(b) Describe titration curve of acidic amino acid. 5

Q. 3. (a) Describe nucleosome structure. 2½
(b) Give the pH-based classification of amino acids. 2½
(c) Give the structure of Tryptophan. 2½
(d) What are exons? 2½

OR

(a) Explain physicochemical properties of proteins. 2½
(b) Give the structure of Arginine. 2½
(c) Explain Dansyl chloride test. 2½
(d) Give chemical composition of nucleic acid. 2½

Q.4) (a)Describe the β- structure of protein 5
(b)Explain octamer of histone protein. 5

OR

(c) Describe the forces that stabilize the structure of tertiary structure of protein. 5
(d) Write a note on domains. 5

Q.5) solve any ten from the following. (1x1=10)
(a)What is myoglobin?
(b)What is Edmans Reaction?
(c).What is composition of amino acid?(
(d).What is cot curve?
(e).What are introns?
(f).Give any two examples of β turn.
(g).What is linker DNA?
(h). Name the forces that stabilizing nucleic acid structure.
(i).Name the various loop of tRNA?
(j).What is base staking interaction in DNA?
(k).Explain Zwittor ion.
(l)Draw the diagram of Z-DNA.

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Q.1) Describe the 30 nm fibres arrangement of nucleosome in a helical structure 10

OR

(a) Write a note on Watson Crick Model 5
(b) Write a note on structure of t-RNA 5

Q.2) (a) Write a note on myoglobin. 2½
(b) Describe the forces that stabilize the structure of tertiary structure of protein. 2½
(c) Describe telomeric and centromeric repeat sequences. 2½
(d) Explain the arrangement of histones in the octamer. 2½

OR

(c) Give the structure of one aromatic amino acid. 2½
(d) Write a note on endopeptidase specificity. 2½
(e) Give the structure of one aromatic amino acid. 2½
(f) Write a note on endopeptidase specificity. 2½

Q.3) (a) Describe the β- structure of protein. 5
(b) Write a note on domains. 5

OR

(c) Describe telomeric and centromeric repeat sequences. 5
(d) Explain the arrangement of histones in the octamer. 5

Q.4) (a) Give the pH-based classification of amino acids and describe titration curve of acidic amino acid. 10

OR

Describe chemical structure and base composition of nucleic acid 10

Q.5) Solve any ten from the following. (1 x10) =10
(a) Give any two examples of α helix polypeptide.
(b) What is nucleotide?
(c) Name indole and imino group containing amino acids.
(d) Name the types of histones.
(e) Define gene.
(f) Define chargaff's rule.
(g) Give any two characteristics of Z- DNA.
(h) Name the forces that stabilizing nucleic acid structure.
(i) Define C- value paradox.
(j) Define chromatin
(k) Define exons.
(l) Name any two non essential amino acids.

Bachelor of Science (B.Sc.) Semester—I Examination

BIO–TECHNOLOGY– (Macromoleules)

Optional Paper—2

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw diagrams whenever necessary.

1. Describe Watson-Crick model of DNA structure. 10

OR

(a) Describe the structure of tRNA. 5

(b) Discuss base pairing in nucleic acids. 5

2. Discuss structure of a nucleosome. 10

OR

(a) Describe cot curve and its significance. 5

(b) Write a note on role of telomere and centromere. 5

3. Discuss titration curve of neutral amino acid. 10

OR

Write notes on :

(a) Classification of amino acids on the basis of pH. 5

(b) Need and method to break disulphide (-S-S-) bonds in proteins. 5

4. Discuss secondary structure of proteins. 10

OR

Briefly discuss :

(a) Protein denaturation 5

(b) Quaternary structure of proteins. 5

5. Solve any **Ten** : 10

(i) Name a pyrimidine base.

(ii) What is a nucleoside ?

(iii) What is an exon ?

(iv) What is C-value paradox ?

(v) What is Isoelectric point of an amino acid ?

(vi) What is the role of scaffolding proteins in chromatin structure ?

(vii) Name a non-essential amino acid.

(viii) Name the simplest amino acid.

(ix) Name a chemical used in Maxan–Gilbert sequencing method to modify bases.

(x) Give any one advantages of oligomeric protein.

(xi) How many α-helices are present in structure of myoglobin ?

(xii) Secondary strucutre fo proteins are primarily stabilized by which types of bonds ?

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