2021

Time : 3 hours

Full Marks : 100

Pass Marks : 45

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

*Answer **five** questions, selecting at least **one** from each Group, in which Q. No. 1 is compulsory.*

1. Select the correct answer from the given alternatives : 2×10 = 20

   (a) The catalytic efficiency of two different enzymes can be compared by the :

   (i) Molecular size of the enzyme

   (ii) Formation of the product

(iii) p^H of optimum value

(iv) K_m value

(b) Which of the following biomolecules does have a phosphodiester bond ?

(i) Monosaccharides in a polysaccharide

(ii) Amino acids in a polypeptide

(iii) Nucleic acids in a nucleotide

(iv) Fatty acids in a diglyceride

(c) Which purine base is found in RNA ?

(i) Cytosine

(ii) Guanine

(iii) Thymine

(iv) Uracil

(d) Essential aminoacid is :

(i) Aspartic acid

(ii) Glycine

(iii) Serine

(iv) Phenylalanine

(e) Which of the following is not a property of the genetic code ?

(i) Ambiguous

(ii) Degeneracy

(iii) Non-overlapping

(iv) Universal

(f) The first phase of translation is :

(i) Recognition of an anticodon

(ii) Recognition of DNA molecules

(iii) Binding of mRNA to ribosome

(iv) Aminoacylation of tRNA

(g) In negative operon :

(i) cAMP have negative effect on lac operon

(ii) Co-repressor binds with repressor

(iii) Co-repressor does not bind with repressor

(iv) Co-repressor binds with inducer

(h) A gene whose expression helps to identify transformed cell is known as :

(i) Selectable marker

(ii) Structural gene

(iii) Vector

(iv) Plasmid

(i) Restriction endonucleases are :

(i) Synthesized by plants

(ii) used in vitro DNA synthesis

(iii) Used in genetic engineering

(iv) Present in golgi complex

(j) Silencing of mRNA has been used in producing transgenic plants resistant to :

(i) Boll worms

(ii) Nematodes

(iii) White rust

(iv) Bacterial blight

Group – A

2. Describe any **four** of the following : 5×4 = 20

   (a) Explain the composition of triglyceride.

   (b) Describe the Watson and Crick model of DNA.

   (c) Describe primary structure of protein.

   (d) Compare cellulose and chitin.

   (e) Illustrate the lock any key hypothesis enzyme action.

   (f) Fatty acids

3. Describe the following : 5×4 = 20

   (a) Types of RNA

   (b) Phospholipid

   (c) Cholesterol

   (d) Secondary plant metabolites

4. What are Carbohydrates ? Give the properties of monosaccharides and Oligosaccharides. 20

Group – B

5. Discuss the differences between the lac operon and the tryptophan operon. 20

6. Write short notes on any **four** of the following : 5×4 = 20

   (a) Polymerase chain reaction

   (b) Properties of genetic code

   (c) RNA splicing

   (d) Restriction enzymes

   (e) Southern blotting technique

   (f) DNA fingerprinting

7. What do you understand by Recombinant DNA technology ? Give an account on role of vectors in rDNA technology. 20

Group – C

8. Define biotechnology. Explain the principles of biotechnology. 20

9. Write short notes on any **two** of the following : 10×2 = 20

(a) Tissue culture

(b) Clonal propagation

(c) Protoplast culture and somatic hybridization

10. Describe the following : 10×2 = 20

(a) "Agrobacterium tumifaciens is a natural vector." Give your views.

(b) Tools of genetic engineering.