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J-3368[S-1224]

[2037]

B.Sc. (Semester - 1st)

INTRODUCTION TO BIOTECHNOLOGY (BSC-BT- 101)

GENETIC ENGINEERING & SCOPE OF BIOTECHNOLOGY

Time : 03 Hours **Maximum Marks : 75**

Instruction to Candidates:

1) Section - A is **compulsory.**
2) Attempt any **Nine** questions from Section - B.

Section - A

Q1) ***(15 × 2 = 30)***

a) Name four types of interactions that occur between atoms or molecules.

b) What are the major differences among the polysaccharides glycogen, starch and cellulose?

c) The genetic information in DNA comprises a code for primary structure of a protein? What determines the important arrangements of secondary and tertiary structure for the protein?

d) What are B and T lymphocytes?

e) Identify several factors that influence enzyme activity.

f) What is the importance of glucose in biological systems?

g) How many ATP molecules are generated in anaerobic glucose metabolism? Also calculate the efficiency of anaerobic glucose breakdown.

(ΔG^{o} ATP/ ADP = + 14.7 kcal/mol, ΔG^{o} glucose/lactate = - 47 kcal/mol)

h) Define replication and transcription

i) What are restriction enzymes? Give examples.

j) Define heterozygous and homozygous.

k) State briefly how plasmid plays a part in conjugation.

l) What are the different classes of antibody?

m) What is 'gene'?

n) Name some inhibitors of protein synthesis mentioning their target site.

o) What do you mean by the term phenotype and genotype?

P.T.O.

Section - B

(9 × 5 = 45)

Q2) What is translation and how it is controlled in prokaryotic system?

Q3) Discuss the structure of DNA and RNA.

Q4) State the use of gel-electrophoresis in molecular biology.

Q5) What are the enzymes? Discuss their role in living organism.

Q6) What are Punnett squares? Determine the pattern of inheritance in dihybrid crosses using this Punnett squares.

Q7) Describe how the immune response acts against pathogens in human.

Q8) What are the basic characteristic of a photosystem? Explain how "photo system one" differs from "photo system two".

Q9) Abnormality in chromosomes gives rise to diseases of karyotype. How this aberration occurs?

Q10) Compare the function of lysosome and peroxisome.

Q11) Write notes on bacterial transformation.

Q12) What are the different types of tissue culture used in plant system? Also state their importance in biotechnology.

Q13) Discuss briefly Artificial Insemination and cloning of Embryos.