

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022  
(Fourth Semester)

Branch – BOTANY

MOLECULAR BIOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 1 = 10)

- Which one of the following is a fibrous protein?  
(i) Haemoglobin (ii) Keratin  
(iii) Glutenin (iv) Oryzenin
- The \_\_\_\_\_ structure of proteins refers to their helical nature  
(i) primary (ii) secondary  
(iii) tertiary (iv) quarternary
- Building blocks of nucleic acids are  
(i) nucleosides (ii) amino acids  
(iii) nucleotides (iv) histones
- Purine derivative among the following bases is  
(i) uracil (ii) cytosine  
(iii) guanine (iv) thiamine
- The process of DNA replication is affected by the enzyme  
(i) mutase (ii) polymerase-I  
(iii) ligase (iv) ribonuclease
- A cis-acting sequence that increases the efficiency of some eukaryotic promoters is called  
(i) enhancer element (ii) essential gene  
(iii) constitutive gene (iv) inducer
- The synthesis of a polypeptide chain is completed by  
(i) degenerate codon (ii) initiation codon  
(iii) termination codon (iv) mis sense codon
- The DNA sequence to which RNA polymerase binds to initiate transcription of a gene is called  
(i) enhancer (ii) initiator  
(iii) promoter (iv) trailer
- Polytene chromosomes were discovered by  
(i) Ruckert (ii) Balbiani  
(iii) Wilson (iv) Waldayer
- \_\_\_\_\_ is a set of closely linked genes regulating a metabolic pathway in prokaryotes  
(i) Cistron (ii) Muton  
(iii) Operon (iv) Codon

Cont...

**SECTION - B (35 Marks)**

Answer **ALL** Questions

**ALL** Questions Carry **EQUAL** Marks

(5 x 7 = 35)

- 11 a Analyse the chemical composition of proteins.  
OR  
b Bring out the classification of proteins based on their increasing complexity of structure.
- 12 a Describe the structure of a typical tRNA molecule.  
OR  
b Explain Hershey and Chase experiment as a proof of DNA as a genetic material.
- 13 a What do you mean by DNA repair? What are the different categories of DNA repair systems?  
OR  
b Describe the enzymes involved in DNA replication.
- 14 a Elucidate the mechanism of transcription regulation.  
OR  
b Describe the post transcriptional modifications.
- 15 a Write an explanatory note on the induction and repression in the regulation of gene expression.  
OR  
b Give an illustrative account on the organization of an eukaryotic chromosome.

**SECTION - C (30 Marks)**

Answer any **THREE** Questions

**ALL** Questions Carry **EQUAL** Marks (3 x 10 = 30)

- 16 Summarize the biological functions of proteins.
- 17 Illustrate the Watson and Crick model of DNA.
- 18 Describe in detail about the replication of prokaryotic DNA.
- 19 Explain the mechanism of translation.
- 20 Write an essay on the regulation of gene expression in prokaryotes.

Z-Z-Z

END