

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 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)

- 1 A muscle protein, transports oxygen in the muscles is  
(i) transferrin (ii) ferritin  
(iii) myoglobin (iv) hemoglobin
- 2 Casein is a  
(i) glycoprotein (ii) phosphoprotein  
(iii) lipoprotein (iv) nucleoprotein
- 3 Left handed DNA is  
(i) A-DNA (ii) B-DNA (iii) Z-DNA (iv) C-DNA
- 4 The strand of DNA which is synthesized continuously in 5' – 3' direction during replication is  
(i) leading strand (ii) leader sequence  
(iii) lagging strand (iv) leucine zipper
- 5 In DNA the enzyme which breaks the hydrogen bonds is  
(i) ligase (ii) helicase  
(iii) topoisomerase (iv) polymerase
- 6 The RNA acts as an adaptor molecule which binds an amino acid and ribosomes and facilitates translation is  
(i) mRNA (ii) rRNA (iii) antisense RNA (iv) tRNA
- 7 A codon that is altered from its normal sense form is known as  
(i) missense codon (ii) non sense codon  
(iii) initiation codon (iv) stop codon
- 8 The synthesis of complementary DNA to a RNA using the RNA as template is called  
(i) reversion of mutation (ii) reverse translation  
(iii) retro regulation (iv) reverse transcription
- 9 Lampbrush chromosome was discovered by  
(i) Balbiani (ii) Wilson (iii) Ruckert (iv) Winchester
- 10 In eukaryotes and bacteria the most common form of regulation is carried out by  
(i) promoter control (ii) transcriptional control  
(iii) repressor control (iv) translational control

Cont...

**SECTION - B (35 Marks)**Answer **ALL** Questions**ALL** Questions Carry **EQUAL** Marks (5 x 7 = 35)

- 11 a Outline the classification of proteins based on their solubility and shape.  
(OR)  
b Discuss the biological role of proteins.
- 12 a Describe the structure of a mRNA.  
(OR)  
b Explain the chemical composition of nucleic acids.
- 13 a Give an experimental proof for the semi-conservative method of DNA replication.  
(OR)  
b Explain the organization and structural features of a gene.
- 14 a What is polyadenylation? How does it occur in mRNA?  
(OR)  
b Enumerate the characters and properties of genetic code.
- 15 a Explain the negative control of gene expression.  
(OR)  
b Discuss the differences between prokaryotic and eukaryotic gene regulation.

**SECTION - C (30 Marks)**Answer any **THREE** Questions**ALL** Questions Carry **EQUAL** Marks (3 x 10 = 30)

- 16 Explain in detail about the structural levels of organization of proteins.
- 17 Illustrate the rolling circle model of DNA replication.
- 18 Describe the structure, types and functions of rRNA.
- 19 Write an essay on transcription in prokaryotes.
- 20 With neat labeled sketches explain the special types of chromosomes.

Z-Z-Z

END