18MBP03

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch – **APPLIED MICROBIOLOGY**

CELL & MOLECULAR BIOLOGY

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. Which phase forms spindle?
   (i) G_1 Phase (ii) G_2 Phase (iii) M Phase (iv) S Phase

2. What is the function of RFC in eukaryotic replication?
   (i) Catalytic subunit (ii) SSB (iii) Clamp loader (iv) Primase

3. What is the usual sequence of a Pribnow box?
   (i) AUAUA (ii) TATAAT (iii) UUUUU (iv) TTGACA

4. Which stop codon has been found to encode Selenocysteine?
   (i) UAA (ii) UAG (iii) UGA (iv) AGA

5. Find the negative regulation of gene expression is accomplished by
   (i) Allosteric inhibition
   (ii) Binding of RNA polymerase to the promoter
   (iii) Binding of a repressor to the DNA
   (iv) Binding of a repressor to the RNA polymerase

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a. Determine the reasons for mitosis to occur.
(or)
b. Sketch the signaling through G-Protein coupled receptors.

7. a. How many types of histones are there? Explain its function.
(or)
b. Illustrate the experiment of Meselson and Stahl for semi-conservative replication.

8. a. Discuss various forms of RNA polymerase with its roles.
(or)
b. Elucidate the concept of Rho-dependent termination.

9. a. Explain Wobble hypothesis.
(or)
b. Differentiate between monocistronic and polycistronic mRNA.

Cont...

10. a. Compare positive and negative gene regulation.

(or)

b. Discuss the structural and functional gene in Lac operon.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11. a. Define various phases of cell cycle. Add a note on significance of mitotic cell division.

(or)

b. Describe different types of cell surface receptors for cell signaling.

12. a. Briefly describe the process of DNA replication in *E.coli.*

(or)

b. Describe the sequence of events during DNA replication in eukaryotes.

13. a. Explain the eukaryotic Transcription initiation factors along with their functions.

(or)

b. Elucidate different post transcriptional modification.

14. a. Describe the salient features of Genetic code.

(or)

b. Enumerate the various differences between prokaryotic and eukaryotic translation.

15. a. Briefly describe the process of regulation of gene expression in Lac operon.

(or)

b. Discuss the mechanism of gene regulation in Tryptophan operon.

Z-Z-Z END