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Reg. No. :

Code No. : 7194

Sub. Code : PMBM 21

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2018.

Second Semester

Microbiology

MOLECULAR BIOLOGY AND GENETICS

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. The fact that DNA bears the genetic information of an organism implies that _____
 - (a) Base composition should be identical from species to species
 - (b) DNA base composition should change with age
 - (c) DNA from different tissues in the same organism should usually have the same base composition
 - (d) DNA base composition is altered with nutritional state of an organism

2. Genetic information flows from _____
 - (a) DNA to DNA
 - (b) DNA to RNA
 - (c) RNA to cellular proteins
 - (d) DNA to cellular proteins
3. Genetic code is _____
 - (a) Overlapping
 - (b) Non overlapping
 - (c) Not universal
 - (d) Ambiguous
4. mRNA is complementary to the nucleotide sequence of _____
 - (a) Coding strand
 - (b) Ribosomal RNA
 - (c) tRNA
 - (d) Template strand
5. Translation results in a product known as _____
 - (a) Protein
 - (b) tRNA
 - (c) mRNA
 - (d) rRNA
6. In eukaryotic cells _____
 - (a) Formylated tRNA is important for initiation of translation
 - (b) Cyclohexamide blocks elongation during translation
 - (c) Cytosolic ribosomes are smaller than those found in prokaryote
 - (d) Erythromycin inhibits elongation during translation.

7. For transformation, micro particles coated with DNA to be bombarded with gene gun are made up of _____

- (a) Silicon or Platinum
- (b) Gold or Tungston
- (c) Silver or platinum
- (d) Plantinum or zinc

8. Plasmid has been used as vector because _____

- (a) Both and show replication
- (b) It can move between prokaryotic and eukaryotic cells
- (c) It is circular DNA which have capacity to join to eukaryotic DNA
- (d) It has antibiotic resistant gene

9. The first transposable elements were discovered in _____

- (a) Rice
- (b) Maize
- (c) Sugar cane
- (d) None

10. One family of transposable elements in the fruit fly *Drosophila melanogaster* are called _____

- (a) S elements
- (b) P elements
- (c) O elements
- (d) Z elements

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write short notes on SOS repair.

Or

(b) Add notes on photo reactivation.

12. (a) Write notes on protein transport.

Or

(b) Write elaborate notes on RNA processing.

13. (a) Discuss in detail about operon concept.

Or

(b) Briefly explain catabolic repression.

14. (a) Give an account of Pili.

Or

(b) Write short notes on Hfr cells.

15. (a) Discuss about transposable elements.

Or

(b) Add notes on retroposon.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Can we repair DNA? How are errors corrected during DNA replication? Explain.

Or

- (b) Write an essay on Griffith experiment.

17. (a) Explain in detail about the process of translation.

Or

- (b) Differentiate the synthesis of mRNA occurs in prokaryotes and eukaryotes.

18. (a) Explain in detail about trp operon.

Or

- (b) Write an essay on gene silencing.

19. (a) Write about the characters and replication of a plasmid.

Or

- (b) Write in detail about specialized transduction.

20. (a) Describe about IS elements? How its significant at the time of conjugation?

Or

- (b) What are jumping genes? How it creates mutant and explain?
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