

(6 pages)

Reg. No. :

Code No. : 9410

Sub. Code : HBOM 23

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2015.

Second Semester

Botany

Paper VI — GENETICS AND MOLECULAR BIOLOGY

(For those who joined in July 2012 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. The locations on the chromosomes for quantitative trait genes are

- (a) Quantitative trait loci
- (b) Qualitative trait loci
- (c) Microsatellite
- (d) Sequence tagged site

- 2. The alternative forms of gene existence is
 - (a) Linkage
 - (b) Transformation
 - (c) Alleles
 - (d) Transduction
- 3. Number of distinct DNA polymerase involved in Eukaryote's replication is
 - (a) 4
 - (b) 5
 - (c) 3
 - (d) 2
- 4. The bacterial genome is
 - (a) Nucleoid
 - (b) Mitochondria
 - (c) Nucleolus
 - (d) Callus
- 5. Packing of foreign DNA inside animal viruses is
 - (a) Conjugation
 - (b) Transformation
 - (c) Transduction
 - (d) Lipofection
- 6. Mismatches are usually corrected by
 - (a) Recombination repair
 - (b) Excision repair
 - (c) Photo reactivation
 - (d) Error – prone repair
- 7. L – Amanitin is a toxin produced by
 - (a) Aspergillus niger
 - (b) Amanita phalloides
 - (c) Armelleria
 - (d) Alternaria



8. The enzymes that restrict the viral replication are known as

- (a) Synthetic enzymes
- (b) Restriction enzymes
- (c) Polymerases
- (d) Nucleases

9. Plus – minus DNA sequencing method developed by Sanger is otherwise known as

- (a) Automatic sequencing
- (b) Chemical degradation
- (c) Ligation mediated PCR
- (d) Dideoxy nucleotide

10. The transcriptional stage of gene regulation in prokaryotes is controlled by

- (a) The arg regulon (b) The put system
- (c) The lac operon (d) Stringent control

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) What do you mean by suppressor mutation? Explain its consequences.

Or

(b) Describe the chromosome theory of inheritance.

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12. (a) What are telomeres? Correlate telomeres with senescence and cancer.

Or

(b) Write short notes on nucleosome concept.

13. (a) Explain the process of insertion of foreign DNA into animal viruses.

Or

(b) Illustrate how phages reproduce in lytic cycle.

14. (a) Give a schematic representation of the synthesis of RNA from DNA.

Or

(b) Write short notes on Alkaptonuria.

15. (a) Explain the cleavage of Purine by using dimethyl sulphate.

Or

(b) Write short notes on catabolite repression with reference to its function in gene regulation.

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PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b),
Each answer should not exceed 600 words.

16. (a) Explain in detail the concept of Frame shift with suitable sketches.

Or

- (b) What do you mean by gene? Discuss the different units of gene in detail.

17. (a) Explain with illustration the process of DNA replication in Eukaryotes and add a note on the inhibitors involved in it.

Or

- (b) Write an essay on the characteristic features of bacterial genome.

18. (a) What is transduction? Write the methods and application of transduction.

Or

- (b) Write notes on the following

- (i) Photo reactivation
- (ii) Base excision repair
- (iii) Nucleotide excision repair
- (iv) Mismatch repair.

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19. (a) Write notes on initiation, elongation and termination with reference to transcription in E. Coil.

Or

- (b) What is genetic code? Write an essay on Genetic code with suitable sketches.

20. (a) With the help of suitable sketches. Write an essay on gene regulation by lac operon model.

Or

- (b) Give a detailed account of Maxam – Gilbert method of DNA sequencing.

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