

(6 pages)

Reg. No. :

Code No. : 8551

Sub. Code : HBOM 23

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2013.

Second Semester

Botany

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 the questions.

Choose the correct answer :

1. Barbara McClintock discovered transposons in
 - (a) Rice
 - (b) Wheat
 - (c) Maize
 - (d) Sugarcane.
2. A codon is represented by
 - (a) Binucleotide sequence
 - (b) Trinucleotide sequence
 - (c) Mononucleotide sequence
 - (d) Tetranucleotide sequence

3. In Eukaryotic chromosome MTOCs refers to
 - (a) Multiple organizing centres
 - (b) Microtubule organizing centres
 - (c) Mutatant organizing centres
 - (d) Microtubules and centromeres.
4. In virus, the nucleic acid genome is contained within a
 - (a) Rod
 - (b) Tail
 - (c) Capsid
 - (d) Filament.
5. The mobile segments of DNA are called
 - (a) Cistron
 - (b) Intron
 - (c) Exon
 - (d) Transposons.
6. Mismatches are usually corrected by
 - (a) Recombination repair
 - (b) Excision repair
 - (c) Photo reactivation
 - (d) Error-prone repair.
7. The enzymes involved in joining DNA molecules by forming phosphodiester linkage between DNA segments
 - (a) RNase
 - (b) Alkaline phosphatase
 - (c) DNA ligase
 - (d) DNase I

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8. The other name of the sequence Hogness box is
 (a) Pribnow box (b) CAAT box
 (c) TFID box (d) TATA box.
9. The transcriptional stage of gene regulation in prokaryotes is controlled by
 (a) The arg regulon (b) The put system
 (c) The lac operon (d) String cut control.
10. DNA sequencing shot gun method is formulated by
 (a) Maxam (b) Gilbert
 (c) Coulson (d) Messing.

PART B — (5 × 5 = 25 marks)

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

11. (a) Write short notes on cistron, recon and overlapping gene.
 Or
 (b) Differentiate physical mapping from genetic mapping.
12. (a) Explain the concept of eukaryotic chromosome is a segregation device.

Or

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- (b) Write short notes on :
 (i) Alkaline phosphatase
 (ii) Reverse Transcriptase.

13. (a) Write short notes on types of DNA damage.

Or

- (b) Write short notes on a natural microbial recombinant process.
14. (a) Write short notes on alkaptomuria.

Or

- (b) Give an schematic representation of synthesis of RNA from DNA.
15. (a) Explain the types of gene regulation in prokaryotes in the suitable example.

Or

- (b) Enumerate the application of shotgun method for creation of random clones.

PART C — (5 × 8 = 40 marks)

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

16. (a) Give the detailed account of the following :
 (i) Allele
 (ii) Allelic pair

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- (iii) Homozygote
- (iv) Heterozygote and confirm the Mendel's law of hypothesis with suitable example.

Or

- (b) Explain molecular basis of mutation with special emphasis on point mutation.
17. (a) Elaborate the eukaryotic genome organization.

Or

- (b) Give a detailed account of restriction endonucleases.
18. (a) What is DNA damage? Explain its classification and consequences.

Or

- (b) Give evidence that the conjugation transfers single stranded DNA with suitable sketches.
19. (a) Write an essay on biosynthetic pathways with relevant examples.

Or

- (b) Explain in detail one gene one enzyme hypothesis.

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

Or

- (b) Elaborate the Messing's method of genomic DNA cloning.
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