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H-7322

M.Sc. (Semester-II) Examination, 2022

BIOTECHNOLOGY

(Genetics and Molecular Biology)

Time Allowed : Three Hours

Maximum Marks : 70

Minimum Passing Marks : 25

Note : This question paper is divided into four sections. Attempt questions from all four sections as per given directions.

SECTION-A

Note : Attempt **any ten** questions. Each question carries **1** mark. [1x10=10]

1.(A) Fill in the blanks :

(i) The series of three nucleotides of DNA that codes for an amino acid is known as _____.

(ii) The full form of QTL is _____.

(iii) Synthesis of mRNA from DNA template is known as _____.

(iv) The term linkage was coined by _____.

(v) The sugar present in DNA molecule is _____.

(B) Multiple Choice Type Question :

(vi) In a dsDNA if 20% Thymine is there, the percentage of Guanine in the DNA is :

(a) 30%

(b) 10%

(c) 90%

(d) 40%

(vii) Which of the following is an initiation codon?

(a) UGA

(b) AUG

(c) UGG

(d) UAC

(viii) Wobble position means :

(a) Base pairing

(b) Third altered base on codon

(c) Altered base on code

(d) None of the above

(ix) Enzyme which can break and seal the DNA strand is :

(a) Topoisomerase II

(b) Helicase

(c) Primase

(d) Restriction endonuclease

(x) The ability of a gene to have multiple phenotypic effects is known as :

(a) Pleiotropy

(b) Co-dominance

(c) Incomplete dominance

(d) Epistasis

(xi) The plant in which Hugo de Vries introduces the concept of mutation is :

(a) Oenothera lamarckiana

(b) Pisum sativum

(c) Allium cepa

(d) Mirabilis jalapa

(xii) How many different genotypes are possible from a cross between the parents RR and rr?

(a) Four

(b) One

(c) Three

(d) Two

SECTION-B

(Very Short Answer Type Questions)

Note : Attempt **any five** questions. Each question carries **2** marks. (Maximum word limit **25-30** words) [2x5=10]

2. Comment on the following in breif :

(i) Law of independent assortment

(ii) Wobble hypothesis

(iii) RNA polymerase I

(iv) miRNA

(v) Codon bias

(vi) Epistasis

(vii) RFLP

SECTION-C

(Short Answer Type Questions)

Note : Attempt **any five** questions. Each question carries **4** marks. (Maximum word limit **250** words) [4x5=20]

3. Explain the following :

(i) Chromosomal theory of inheritance.

(ii) Gene pyramiding

(iii) CRE/Lox recombination

(iv) Heterochromatinisation

(v) RNA Editing

(vi) Mismatch repair

(vii) Antisense RNA

SECTION-D

(Essay Type Questions)

Note : Attempt **any three** questions. Each question carries **10** marks. (Maximum word limit more than **500** words)

[10x3=30]

4. (i) Discuss the mechanism of DNA repair.

(ii) Give a detailed account on transcription in eukaryotes.

(iii) Write a note on Marker-assisted selection (MAS).

(iv) Explain post-translational modifications of proteins.

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