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D-6612

M.Sc. (Ist Semester) Examination, 2020

BOTANY

(Genetics and Cytogenetics)

Time Allowed : Three Hours

Maximum Marks : 70

SECTION - A

Note : Attempt any ten questions. Each question carries 1 mark. **10**

Q. 1. Objective Type :

(i) The transfer of naked DNA from one cell to another is referred to as _____.

(ii) A gene that has a potential to cause cancer is named as _____.

(iii) Eukaryotes DNA methylation is done by _____.

(iv) Mutations at promoter block initiation of _____.

(v) In tobacco, if the diploid number of chromosomes is 48, how many chromosomes will be found in a pollen grain _____.

(vi) In the F1 generation of a monohybrid cross, the phenotypic ratio would be :

(a) 3 : 1

(b) 1 : 2 : 1

(c) 2 : 1 : 1

(d) 1 : 1 : 2

(vii) Which blood type would not be possible for children of a type AB mother and a type A father ?

(a) O

(b) A

(c) B

(d) AB

(viii) A strand of DNA with the sequence AACTTG will have a complimentary strand with the following sequence :

(a) CCAGGT

(b) AACTTG

(c) TTCAAG

(d) TTGAAC

(ix) When one or more base pair are deleted or added in sequence, shifts reading frame on ribosome, called :

(a) Substitution mutation

(b) Missense mutation

(c) Nonsense mutation

(d) Frame shift mutation

(x) The set of DNAs generated by using random primers in a PCR reaction is called :

(a) RAPD

(b) RFLP

(c) AFLP

(d) In situ hybridization

(xi) In RNA splicing introns are removed and :

(a) Exons remain

(b) Exons are also removed

(c) Gene amplifies

(d) Gene cloning takes place

(xii) Repeating subunit of chromatin is called :

(a) Nucleus

(b) Nucleotide

(c) Nucleosome

(d) DNA network

SECTION - B

Note : Attempt any five questions. Each question carries 2 marks. **10**

Q. 2. Very short answer type (25-30 words) :

(i) Define gene.

(ii) Write full name of RAPD.

(iii) What is chromosomal duplication ?

(iv) Define gene interaction.

(v) What are oncogenes ?

(vi) Explain allele theory.

(vii) Why is karyotyping important ?

SECTION - C

Note : Attempt any five questions. Each question carries 4 marks. **20**

Q. 3. Short answer type (250 words) :

(i) Why is crossing over ? Write its two importances.

(ii) Explain bacterial transduction.

(iii) Explain method of RFLP analysis.

(iv) Explain Mendel's law of segregation with suitable example.

(v) What is chromosomal theory of inheritance ?

(vi) What is importance of QTL study in crop improvement ?

(vii) What is BAC ? Draw neat structure of it.

SECTION - D

Note : Attempt any three questions. Each question carries 10 marks. **30**

Q. 4. Essay type (more than 500 words) :

(i) What is gene tagging ? Explain its application in crop improvement.

(ii) Explain Prokaryotic gene regulation in detail.

(iii) Write a note on types, causes and effects of mutation.

(iv) Explain FISH and GISH cytogenetic analysis techniques in detail.