KERALA AGRICULTURAL UNIVERSITY

B.Sc. (Hons.) Agriculture – 2008 Admission - Ist Semester
Final Examination – March/April 2009

Title   : Pbgn 1102   Max. marks: 80
Course: Principles of Genetics & Cytogenetics (2+1)   Time   : 3 hours

Q.I. Answer the following   (20 x 0.5 = 10)

Fill up the blanks

1.   The term genetics was coined by ....
2.   .... is a specialized region in the chromosome for attachment to spindle fibre
3.   The chromosome theory of inheritance was proposed by .... in 1902
4.   A set of three nucleotides on mRNA, that is specific for a particular amino acid during protein synthesis is called ....
5.   Alternate forms of genes are called as ....
6.   The Mendelian dihybrid F_2 ratio is ....
7.   A sudden heritable change in an organism is referred to as ....
8.   The observed frequency of double crossing over between linked genes divided by their expected or calculated frequency is known as ....
9.   A chromosome in which the centromere is at one end is called .... chromosome
10. The paired homologous chromosomes during prophase I is called ....

State True or false

11. Triploidy is a structural abnormality of chromosome.
12. One crossing over always reduces the probability of another cross over in its near vicinity
13. The genetic material in viruses is RNA
14. Termination of transcription is achieved by the action of nonsense codon
15. Chromosomes at meiotic telophase I will have two chromatids each

Name the following

16. The phenomenon of masking the effect of one allele by its alternate allele
17. A system of regulation of metabolic pathway by the activity of cistrons, operator and promoter sites.
18. The chemical bonds that join the nucleotides in a nucleotide chain
19. The enzyme required for mRNA synthesis during transcription
20. The scientist who proposed the concept of muton, recon and cistron with reference to a gene

Q II   Define the following in one sentence   (10 x 1 = 10)

1.   Mendel's law of independent assortment   6.   Epistasis
2.   Aneuploidy   7.   Karyotype
3.   Autosomes   8.   Inversion
4.   Chiasma   9.   Hemizygous
5.   Codominance   10.   Morgan unit

Q III Write short notes on ANY TEN of the following   (10 x 2 = 20)

1. Translocation
2. Chiasmatype theory of crossing over
3. Genetic code
4. Karyotype and ideogram
5. Ribosomes
6. Chemical mutagens
7. Cytoplasmic inheritance
8. Pangenesis
9. Multiple alleles
10. Penetrance and expressivity
11. Triticale
12. Structure and function of chloroplast

Q IV Write short essays only ANY FOUR of the following   4 x 5 = 20)

1. History and development of genetics
2. Induced mutations and its significance
3. Operon concept of enzyme regulation
4. Polyploidy, its origin and significance
5. Evolution of wheat
6. Major chromosomal events during meiotic anaphase I.

Q V Write essays on ANY TWO of the following   2 x 10 = 20)

1. DNA structure and replication
2. Elaborate qualitative and quantitative inheritance and bring out their major differences
3. Write an essay on mutations elucidating reasons for their spontaneous origin, methods of
    artificial induction and practical significance in agriculture with examples