

Total Pages—5

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**M.Sc. 3rd Semester Examination**

**BIOCHEMISTRY**

**PAPER – BIC-303**

*Full Marks : 40*

*Time : 2 hours*

**Answer all questions**

*The figures in the right-hand margin in  
Candidates are required to give their answers  
own words as far as practicable*

*Illustrate the answers wherever necessary*

**GROUP – A**

1. Answer any *five* from the following
  - (a) An individual with 47 chromosomes including an additional chromosome is said to be (i) triplet (ii) trisomic (iii) trisomy (iv) tricycle.

- (b) What are the main objective of the study of 'Metabolomics' ?
- (c) What are the different types of satellite DNA ?  
What are their utility ?
- (d) What is linkage mapping ? Mention the principle of this procedure with its utility.
- (e) What different levels the translational regulations may be controlled ?
- (f) Pattern 'baldness is more frequent in male and is assumed to result from (i) Y-linkage of trait, (ii) X-linked recessive mode of inheritance, (iii) sex-influenced autosomal inheritance.
- (g) What could be utility p53 knock out mice in research ?
- (h) What is an ' anti-sense' RNA ? Mention its working principle ?

GROUP – B

Answer any *two* from the followi

2. Define 'polymorphism'. What are the :  
of SNPs ? Explain with suitable exa
3. Explain with suitable diagram the  
mination procedure in *Drosophila Me*
4. Discuss the similarities and differen  
miRNAs and siRNAs in terms of –  
(i) location and structure of genes  
them,  
(ii) their function in post transcrip  
silencing.
5. What are the importance of the so ca  
part of the DNA sequences ? How do  
evolution ? Define natural selection

GROUP – C

Answer any *two* from the follow

6. (a) What are the reporter and ma

used in gene targetting procedure ? Give Example.

(b) With suitable diagram briefly describe homologous gene targetting procedures. 2 + 8

7. Briefly describe different gene transfer procedure in plant, bacteria and eukaryotive cells ? 10

8. (a) What are nuclear orphan receptors ? How do they function ? What are the use of stem cells in RDT ?

(b) Briefly define functional genomics.

(c) Briefly define 'epistasis' and heterosis ?

$$(4 + 2) + 1\frac{1}{2} + 1\frac{1}{2} + 1$$

9. Both fragile X-syndrome and Huntington disease are caused by trinucleotide repeat expansion. Individuals with fragile X syndrome have at least 200 CCG repeats at the 5' end of FRM-1 gene. In contrast, individuals with Huntington disease have 36 or more in frame CAG repeats within protein-coding region of the Huntington gene.

(a) Do you expect gene expression at the two

( 5 )

genes to be affected in the same repeat expansion ? Explain you

- (b) Based on your answer why m syndrome be recessive, where a disease to dominant.
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