

**2014**

**M.Sc.**

**3rd Semester Examination**

**BIOCHEMISTRY**

**PAPER—BIC-303**

*Full Marks : 40*

*Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

**Group—A**

1. Answer any *five* questions from the following : 5×2
- (a) Mention the cause of Down's Syndrome what are the clinical manifestation ?
  - (b) Site an example of frame shift mutation in human.
  - (c) Define double monosomic and nullizomic condition.
  - (d) What are the epigenetic modification and how it can be related to disease condition ?

*(Turn Over)*

- (e) What is pharmacogenomics ?
- (f) What do you know about 'RNA editing' ?
- (g) What is maternal inheritance ? How it can be related to some specific disease condition ?
- (h) What are 'homebox' and 'fatemap' ?

**Group—B**

Answer any *two* questions from the following : 5×2

2. (a) What are hermaphrodites, androgen insensitivity and pseudohermaphrodite ? Discuss the chromosomal basis.
- (b) What is  $X_{IST}$  or  $X_{IC}$  gene ? What is its function ?
3. Explain the concept of linkage and crossing over with suitable diagram.
4. (i) What are the important resolutions of human genome project ?
- (ii) Mention the significance of microarray technique used in molecular Biology. 5
5. (i) Discuss that how 'exon shuffling' regulate differential gene expression.
- (ii) Give an example of somatic mutation. 4+1

**Group—C**

Answer any *two* questions from the following : 10×2

6. (i) Draw and explain the Holiday model of recombination.
- (ii) Name the male sex determining region and its locations. Explain in brief, how does it work in male sex determination.
- 5+5
7. (i) Why Calico Cats (females) possess mosaic furr i.e. pattern of orange-black and white on their body?
- (ii) The probability or occurrence of recombination between genes is directly or indirectly proportional to the distance between the genes. Explain with example.
- (iii) Define Mullerian inhibiting hormone.
- 3+5+2
8. (i) What is gene targetting? How transgenic animals are generated? How the transgenic variety (i.e. fish) may be detrimental to the ecosystem?
- (ii) Discuss briefly the emisonmental regulation on eukaryotic gene expression.

(1+4+2)+3

9. (i) What HAT regulation of gene expression? How does it happen?
- (ii) What are the difference between structural genomics and proteomics? How does proteomics data may be helpful in cellular therapeutics?
- (iii) State the role of transcription factors in eukaryotic gene expression.

(2+2)+(2+2)+2

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