

Printed Pages : 3



NBT-305

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 154318

Roll No.

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B. Tech.

(SEM. III) (ODD SEM.) THEORY
EXAMINATION, 2014-15
GENETICS & MOLECULAR BIOLOGY

Time : 2 Hours]

[Total Marks : 50

Note : Attempt **all** questions as directed.**1** Attempt any **three** of the following : **5×3=15**

- (a) Explain the concept of sex determination in Drosophila.
- (b) If a particular trait in a plant could shown to be inherited solely through mitochondrial DNA, would it be classified as a case of maternal inheritance or maternal effect? Why, explain?
- (c) Describe the two factors and three factors crosses.
- (d) Explain :
 - (i) How genes function independently of one another?
 - (ii) Multiple alleles in human blood.

2 Attempt any **two** of the following : **5×2=10**

- (a) (i) The restriction point in the G_1 phase of the cell cycle is of major importance. Discuss this with reference to the need for a growth factor signal for cell division to proceed.
- (ii) What are caspases? Describe their role and mechanisms by which they become involved in it.
- (b) How did the transformation experiments of Griffith differ from those of Avery and his associates? Explain the significance of both the experiments.
- (c) What background material did Watson and Crick have available for developing a model of DNA? What was their contribution to the building of the model? Describe the structure of nucleotide, nucleoside and RNA.

3 Attempt any **three** of the following : **5×3=15**

- (a) What is a replicon? In separating the strand of parental DNA during replication, what topological problem occurs? How is the problem solved in both E.coli and eukaryotes?
- (b) Describe :
- (i) Substrate for DNA synthesis
- (ii) TTP in DNA synthesis and UTP in RNA synthesis

- (c) Write short notes on :
- (i) Gene cloning
 - (ii) Micro deletion
- (d) Explain the mutation procedures of somatic and germinal mutations.
- 4** Attempt any **two** of the following : **5×2=10**
- (a) In what ways does RNA synthesis differ from DNA synthesis? Describe the process of initiation of transcription of a gene in *E. coli*. Describe the two ways by which, in *E. coli*, gene transcription is terminated.
 - (b) Draw a descriptive analogy of the processed of transcription and translation.
 - (c) Explain genetic code and its properties.
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