



**NBJ-1603220001020500** Seat No. \_\_\_\_\_

**B. Sc. (Bioinformatics) (Sem. II) (CBCS) Examination**

**April / May - 2017**

**BI - 205 : Molecular & Developmental Genetics**

*(New Course)*

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- Instructions :** (1) All questions are compulsory.  
(2) The right side figures indicate total marks of the question.

- 1 Attempt the following : 14
- (a) Answer the following short questions: (All compulsory) 4
- (1) Hershey and Chase used radioactive \_\_\_\_\_ to label the DNA core of the bacteriophage.
- (2) A nonsense mutation may result into a premature termination of the synthesis of a polypeptide (True or False)
- (3) The transfer of genetic material from one bacterium to another via virus is called \_\_\_\_\_
- (4) The mutation which will not affect the length of a protein is \_\_\_\_\_
- (b) Answer any **One** of the following short questions : 2
- (1) Gene as the unit of recombination
- (2) Mutant
- (c) Answer any **One** of the following short questions : 3
- (1) Occurrence of mutation
- (2) Forward and reverse mutation
- (d) Explain any **One** of the following questions in detail : 5
- (1) Explain chemical mutagen and their mode of action
- (2) Explain all the three experiments which proved DNA as genetic material

- 2** Attempt the following : **14**
- (a) Answer the following short questions: (All compulsory) **4**
- (1) tt mates with Tt. What will be characteristic of offspring \_\_\_\_\_ %rececive gonotype?
  - (2) A gene is said to be dominant if it expresses its effect both in homozygous and heterozygous condition. (True / False)
  - (3) A gene pair hides the effect of another. The phenomenon is \_\_\_\_\_
  - (4) In a genetic cross having recessive epistasis, F<sub>2</sub> phenotypic ratio would be \_\_\_\_\_
- (b) Answer any **One** of the following short questions : **2**
- (1) Explain the law of segregation
  - (2) What is allele?
- (c) Answer any **One** of the following short questions : **3**
- (1) Co-dominance by coat color in cattle
  - (2) Explain Law of Independent assortment with example
- (d) Explain any **One** of the following questions in detail : **5**
- (1) Explain interaction of genes with the example of comb pattern in poultry.
  - (2) What are lethal genes? Explain the lethal genes in mice.
- 3** Attempt the following : **14**
- (a) Answer the following short questions: (All compulsory) **4**
- (1) In humans, males are Homogametic.(True or False)
  - (2) Queen Victoria and some of her descendants carried an X-linked gene for \_\_\_\_\_ disease.
  - (3) Women with X-linked disorders always pass the genes for the disorder to \_\_\_\_\_.  
while men with X-linked disorders always pass the genes to \_\_\_\_\_
  - (4) In meiosis, recombination occurs in \_\_\_\_\_ stage of prophase I

- (b) Answer any **One** of the following short questions : 2
- (1) Transduction.
  - (2) Linkage
- (c) Answer any **One** of the following short questions : 3
- (1) Crossing over
  - (2) Sex-linked inheritance
- (d) Explain any **One** of the following questions in detail : 5
- (1) Enlist Gene transfer by Transformation and Conjugation
  - (2) Genotypic frequency occurs in population
- 4 Attempt following : 14
- (a) Answer the following short questions: (All compulsory) 4
- (1) A growth Factor secreting cell acts on nearby target cells by discharging molecules into the extracellular fluid is known as \_\_\_\_\_ signaling
  - (2) Three stages of cell signaling are \_\_\_\_\_, transduction and \_\_\_\_\_.
  - (3) Two most common second messengers are \_\_\_\_\_ and \_\_\_\_\_.
  - (4) \_\_\_\_\_ is differentiation of the imago (adult)
- (b) Answer any **One** of the following short questions : 2
- (1) Draw life cycle drosophila
  - (2) Which Model systems's used for the study of development and differentiation; give characteristic for it
- (c) Answer any **One** of the following short questions : 3
- (1) Features of cytoplasmic inheritance
  - (2) Cell signaling
- (d) Explain any **One** of the following questions in detail : 5
- (1) Cell cell communication
  - (2) Embryonic development in Drosophila

- 5 Attempt the following : 14
- (a) Answer the following short questions: (All compulsory) 4
- (1) Which homeotic genes are present in bithorax complex ?
  - (2) *nanos* and *caudal* mRNAs protein products are important for which part of body formation?
  - (3) Which maternal genes regulate anterior and posterior portion of drosophila embryo?
  - (4) In which chromosome number drosophila homeotic genes are present?
- (b) Answer any **One** of the following short questions : 2
- (1) The cephalic furrow
  - (2) Which homeotic genes are present in Antennapedia complex and which body segments they form?
- (c) Answer any **One** of the following short questions : 3
- (1) The Homeodomain Proteins
  - (2) Early Drosophila Development Cleavage
- (d) Explain any **One** of the following questions in detail : 5
- (1) Explain in detail that in oocyte cytoplasm how maternal gene has effect on polarity regulation
  - (2) Patterns of homeotic gene expression.
-