MBJ-1603220001020500 Seat No. _____

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

March / April - 2018

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 figure indicates total marks of the question.

1 The following questions from Unit - 1 : **14**

(A) Attempt the following objective questions : **4**

(1) A mutation always causes a mutant phenotype. (True or False)

(2) _____ is the unit of function, mutation and recombination.

(3) Co-linearity of gene and polypeptide studied by Yanofsky using _____ pathway in E.coli

(4) In mutation, when adenine is replace by guanine it is called _____

(B) Attempt any **one** out of two from the following : **2**

(1) Gene as the unit of expression

(2) Mutagen

(C) Attempt any **one** out of two from the following : **3**

(1) Explain physical mutagen and their mode of action

(2) Classification of point mutation based on molecular function

(D) Attempt any **one** out of two from the following : **5**

(1) Identification of gene as genetic material

(2) Explain chemical mutagen and their mode of action

2 The following questions from Unit - 2 : **14**

(A) Attempt the following objective questions : **4**

(1) Colorless pigment precursor in sweet pea is _____

(2) Ratio of 9:3:4 is obtained instead of 9:3:3:1 under the condition when there is gene interaction involving

(3) How many different types of genetically different gametes will be produced by a heterozygous plant having the genotype AABbCc?

(4) A gene pair hides the effect of another. The phenomenon is _____

(B) Attempt any **one** out of two from the following : **2**

(1) Enlist the traits analyzed by Mendel?

(2) What is allele?

(C) Attempt any **one** out of two from the following : **3**

(1) Explain incomplete dominance with mirabilis Jalapa

(2) Explain law of segregation with example

(D) Attempt any **one** out of two from the following : **5**

(1) Explain epistasis with its types with example

(2) Explain complementary gene interaction with example

3 The following questions from Unit - 3 : **14**

(A) Attempt the following objective questions : **4**

(1) Crossing Over occurs when the homologous chromosomes contain _____ chromatid

(2) The Zoological name of fruit fly is

(3) The probability that a male inherited his Y chromosome from his maternal grandfather is _____ %

(4) The chromosomal condition of human diploid cell is _____ sex chromosomes + _____ autosomes

(B) Attempt any **one** out of two from the following : **2**

(1) What is X-linked inheritance?

(2) Sexduction

(C) Attempt any **one** out of two from the following : **3**

(1) Linkage

(2) Sex limited inheritance

(D) Attempt any **one** out of two from the following : **5**

(1) Sex determination system

(2) Population genetics

4 The following questions from Unit - 4 : **14**

(A) Attempt the following objective questions : **4**

(1) Variegated four o'clock leaves have white patches among the green areas due to a mtDNA mutation that blocks electron transport. (True or False)

(2) When cells respond to an extracellular signal, they most often convert the information from one form to another. This process is called:

(3) Many of the extracellular signal molecules that regulate inflammation are released locally at the site of infection. What form of cell-to-cell signaling is being used?

(4) When activated by a GPCR, adenylyl cyclase converts ATP to _____

(B) Attempt any **one** out of two from the following : **2**

(1) Which Model systems use for the study of development and differentiation give its characteristic for it

(2) Stages of cell signaling

(C) Attempt any **one** out of two from the following : **3**

(1) What are secondary messenger explain any one

(2) Characristics of cytoplasmic inheritance

(D) Attempt any **one** out of two from the following : **5**

(1) Embryonic development in Drosophila

(2) Types of cell receptor participate in cell signaling

5 The following questions from Unit - 5 : **14**

(A) Attempt the following objective questions : **4**

(1) In Drosophila the process of dorsal-ventral axis specification starts with _____ protein Expression in the dorsal region of the oocyte, where it binds to the _____ receptor of follicle cell.

(2) During the early stages of Drosophila development, mitosis is not accompanied by cytokinesis. (True or False)

(3) _____ Control the development of the segments of the Drosophila embryo.

(4) Gap genes directly regulate pair-rule genes. (True or Fake)

(B) Attempt any **one** out of two from the following : **2**

(1) Syncytial blastoderm

(2) Which homeotic genes are present in Antennapedia complex and which body segments they form ?

(C) Attempt any **one** out of two from the following : **3**

(1) The Homeodomain Proteins

(2) By which experiments it's conformed that the Bicoid protein is crucial for initiating head and thorax formation?

(D) Attempt any **one** out of two from the following : **5**

(1) The effect of Maternal gene to organize posterior center

(2) How torso gene have effect for the formation of terminal region in drosophila like acron and telson