

SARDAR PATEL UNIVERSITY
M. Sc. Integrated Biotechnology – Third Semester Examination
Tuesday, 11th December 2012
Time: 02:30 pm to 05:30 pm.
PS03CIGB06: INTRODUCTION TO GENETICS

- Note: (i) Figures to the right indicate marks.
 (ii) Draw neat and labeled diagram, wherever necessary.
 (iii) "A" part is compulsory from Question 3 to Question 6.

Total Marks – 70

Q-1 Fill in the blanks by choosing appropriate option.

[08]

- (1) Who among the following is called "Father of Genetics" _____
 a. Griffith b. Bateson c. G. J. Mendel d. Morgan
- (2) Cross between F₁ individual with any one of the parents is called _____
 a. Back cross b. Test cross c. Dihybrid cross d. Monohybrid cross
- (3) Dihybrid's 9:3:3:1 ratio is modified in to 9:7 by _____
 a. Duplicate gene action b. Complementary gene action
 c. Supplementary gene action d. Inhibitory gene action
- (4) Mature human sperm contain _____
 a. One X chromosome b. One Y chromosome
 c. One X and one Y chromosome d. Two X chromosomes
- (5) Genes which are present in the same chromosome and inherit together are called _____
 a. Linked genes b. Multiple genes c. Pleiotropic genes d. None of these
- (6) Chiasma formation occurs in _____
 a. Linkage b. Crossing over c. Pleiotropy d. Penetrance
- (7) Trisomy is represented by _____
 a. $2n+2$ b. $2n-2$ c. $2n-1$ d. $2n-1$
- (8) Down's syndrome is associated with _____
 a. Trisomy at chromosome no.18 b. Trisomy at chromosome no.21
 c. Trisomy at chromosome no.13 d. All of these

Q-2 Answer the following. (Any seven)

[14]

- (1) Write a note on incomplete dominance.
- (2) Define test cross with example.
- (3) What are Gynandromorphs?
- (4) What is duplicate gene action? How it modifies 9:3:3:1 ratio?
- (5) Define linkage and write the significance.
- (6) Write a note on the types of crossing over.
- (7) Write the symptoms of Down's syndrome.
- (8) What is chromosomal aberration? Enlist the types of structural aberrations.
- (9) Differentiate monosomy and trisomy.

Q-3 (A) What is dihybrid cross? Describe Mendel's dihybrid cross with example. [6]

(B) What is penetrance? Write the types with suitable examples. [6]

OR

(B) What is pedigree? Write a note on human pedigree patterns. [6]

Q-4 (A) Write a note on sex determination through genic balance theory. [6]

(B) Explain complementary gene action citing example and frequency table. [6]

OR

(B) Explain inhibitory gene action with example. Write a note on the molecular basis for gene interaction. [6]

Q-5 (A) What is crossing over? Write the mechanism of crossing over. [6]

(B) Write a brief note on the types of Linkage with example. [6]

OR

(B) Write a note on plastid inheritance in *Mirabilis jalapa*. [6]

Q-6 (A) Write a detail note on structural chromosomal aberrations. [6]

(B) Give a note on Euploidy and its types. [6]

OR

(B) Define Aneuploidy. Add a note on its types and significance. [6]
