

**SARDAR PATEL UNIVERSITY**  
**M. Sc. Genetics – First Semester Examination**  
**Friday, 21<sup>st</sup> October, 2016**  
**10:00 am to 1:00 pm**

**PS01CGEN02: FUNDAMENTALS OF GENETICS**

**Total Marks - 70**  
**[08]**

**Q-1 Choose the most appropriate answer from the alternatives given:**

- (1) Cross between F1 with parents is known as \_\_\_\_\_.  
(a) Back cross (b) Test cross (c) reciprocal cross (d) All of these
- (2) Multiple effects by a single gene is called \_\_\_\_\_.  
(a) Penetrance (b) Pedigree (c) Expressivity (d) Pleiotropism.
- (3) Dihybrid's 9:3:3:1 ratio is modified by masking gene action in to \_\_\_\_\_.  
(a) 9: 7 (b) 9: 3: 4 (c) 13: 3 (d) 12: 3: 1
- (4) Genes which are present in the same chromosome & inherit together are called \_\_\_\_\_.  
a. Linked genes b. Multiple genes c. Pleiotropic genes d. None of these
- (5) Highly mutable site in the gene is known as \_\_\_\_\_.  
(a) Mutable gene (b) Mutator gene (c) Hotspot (d) Mutation rate
- (6) Reactive oxygen species include \_\_\_\_\_.  
(a) H<sub>2</sub>O<sub>2</sub> (b) Superoxide (c) Hydroxyl radical (d) All of these
- (7) Transposable elements in maize were first discovered by \_\_\_\_\_.  
(a) Stuartevant (b) Mendel (c) Barbara McClintock (d) Correns
- (8) Shell coiling in snail is an example of \_\_\_\_\_ inheritance.  
(a) Paternal (b) Maternal (c) Both (a) and (b) (d) None of these

**Q-2 Answer the following. (Any seven)**

**[14]**

- (1) Write a note on test cross.
- (2) Differentiate complete dominance and incomplete dominance.
- (3) Write a note on environmental sex determination.
- (4) Enlist various physical agents causing DNA damages.
- (5) Write significance of Lederberg experiments in molecular genetics.
- (6) Summarize the three major classes of transposons.
- (7) Define the terms: endosymbionts and integrons
- (8) Give an overview of Newcombe experiment
- (9) Write a note on Gynandromorphs?

(P.T.O.)

- Q-3 (A) Explain Mendel's law of independent assortment with suitable example. Add a note on the characters of Pea plant selected for his experiment. [6]  
 (B) What is epistasis? Explain dominant and recessive epistasis with suitable example. [6]
- OR
- (B) Write short notes on the following:  
 (1) ABO blood group in Man [3+3]  
 (2) Types of lethal genes and their action
- Q-4 (A) Write an essay on the types of Linkage and write the importance. [6]  
 (B) Write a brief note on the types chromosomal sex determination in animals. [6]
- OR
- (B) Write short notes on the following:  
 (1) Conjugation [3+3]  
 (2) Types of recombination
- Q-5 (A) Classify chemical agents causing DNA damages. Explain the mode of working of alkylating and deaminating agents. [6]  
 (B) Enlist various DNA repair system. Describe photo reactivation repair system of *E. coli*. [6]
- OR
- (B) Write short notes on the following:  
 (1) Ames's test [3+3]  
 (2) Classification of mutation on the basis of aminoacid replacement.
- Q-6 (A) Enlist transposable elements of prokaryotes. Explain replicative mechanism for DNA transposons. [6]  
 (B) Explain maternal inheritance in snails. [6]
- OR
- (B) Describe plastid inheritance in *Mirabilis jalapa*. [6]

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 (2)