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SARDAR PATEL UNIVERSITY
M.Sc. (I Semester- CBCS) Examination
Subject: BOTANY
PS01CB0T03; Genetics, Plant Breeding & Evolution
Tuesday, December 4, 2012
Time: 10.30 a.m. to 1.30 p.m.

No. of Printed Pages: 02

Total Marks: 70

Note: Figures in brackets indicate marks
Answer all the questions in the given answer book

Q1. Attempt all the multiple choice questions given below (8x1=8)

- (i) In trihybrid back cross the phenotypic and genotypic ratio is:
a) 1:1:1:1:1:1:1:1:1 b) 27:9:9:9:3:3:3:1
c) 9:3:3:3:1:1:1:1 d) 1:2:1:2:4:2:1:2
- (ii) The phenotypic and genotypic ratio appears as 1:2:1 in which interaction of the genes
(a) Incomplete dominance (b) lethal genes
(c) co-dominance (d) pleiotropy
- (iii) In humans recessive sex-linked or X-linked traits are transmitted from:
a) Fathers to grand sons and mothers to half of the sons
b) Fathers to grand daughters and mothers to all sons
c) Fathers to grand sons and mothers to all sons
d) Fathers to half grand sons and mothers to all sons
- (iv) The maximum frequency of recombinations can result from crossing over between linked genes will be:
a) 100% b) 25% c) 50% d) 0%
- (v) The process in which a part of a chromosome becomes detached and joins a part of a nonhomologous chromosome is called:
a) Deletion b) addition c) Inversion d) translocation
- (vi) After emasculation the inflorescences are bagged to prevent:
a) Cross pollination b) self pollination
c) Hand pollination d) Both (a) & (b)
- (vii) The processes of ----- and ----- generate variation, and ----- produces adaptation to the environment.
a. sexual recombination----- natural selection----- mutation
b. mutation----- sexual recombination----- natural selection
c. genetic drift----- mutation----- sexual recombination
d. mutation----- natural selection----- sexual recombination
- (viii) Mutations are rarely considered the cause of evolution in populations of plants, because they:
a. are often harmful and do not get passed on
b. are only passed on when they occur in cells that lead to gametes.
c. do not directly produce most of the genetic variation present in a diploid population.
d. all of the above.

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Q2. Answer any SEVEN of the following in brief:

(7x2=14)

- i) Classify chromosomes
- ii) ABO blood groups
- iii) Reciprocal cross
- iv) Male sterility
- v) autopolyploidy
- vi) Non-disjunction
- vii) Grafting procedure
- viii) How do you argue that a petaloid bract and a leaf are homologous organs?
- ix) What are vestigial organs in plants? Give any two examples.

Q3. Write short notes on:

- (a) Complete dominance, incomplete dominance and co-dominance (6)
 - (b) Complementary interaction of genes (6)
- OR
- (b) Sex linked inheritance (6)

Q4. Write short notes on:

- (a) Cytoplasmic inheritance with suitable examples (6)
 - (b) Linkage & crossing over and its importance in Genetics (6)
- OR
- (b) Different types of ploidy with suitable examples and their importance (6)

Q5. (a) Write about different methods of reproduction in plants with suitable examples. Highlight the advantages and disadvantages of each method. (6)

- (b) Explain the various methods of plant breeding for improvement of crops (6)
- OR

(b) What are the different steps involved in hybridization? Discuss the techniques involved in each of these steps (6)

Q6. (a) "The vast diversity of plant kingdom is a result of evolution". Citing adequate examples, write a commentary on the statement. (6)

- (b) With the help of diagrams, explain the evolutionary pathway of different types of intermediate inflorescences (6)
- OR

(b) Explain in brief any three kinds of evidences to support evolution in plants. (6)

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