No. of Printed Pages: 2

(A/60)

SARDAR PATEL UNIVERSITY

B.Sc. (Genetics) – Sixth Semester Examination (CBCS)

Friday, 1st April 2016

02:30 p.m. to 5:30 p.m.

US06CGEN03: Principles of Genetics and Breeding

Total Marks: 70

Note: (1) Figures to the right indicate marks.
(2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 **Choose the most appropriate answer from the four alternatives given:** **[10]**

i. **The NBPGR is situated in _____.**
(a) New Delhi (b) Mumbai (c) Bhopal (d) none of these

ii. **ICAR is an autonomous body responsible for co-ordinating for _____in India.**
(a) agriculture education (b) research (c) both (a) and (b) (d) none of these

iii. **One major technique of plant breeding is _____.**
(a) selection (b) non random collection (c) semi hybridization (d) mutation

iv. **Heterosis also called _____.**
(a) Hybrid vigour (b) self fertilization
(c) cross fertilization (d) all of them

v. **Plants created using mutagenesis are sometimes called _____.**
(a) mutagenic plant (b) mutagenic seeds (c) both (a) and (b) (d) none of them

vi. **Self pollinated homozygous plant is a progeny of_____.**
(a) female parent (b) pure line (c) inbred (d) hybrid

vii. **Genetic drift is more likely to occur in a_____.**
(a) small population (b) stable population
(c) large population (d) random population

viii. **Which one of them are molecular markers.**
(a) SNP (b) AFLP (c) both (a) and (b) (d) none of them

ix. **Molecular markers are used to construct _____.**
(a) chromosome maps (b) cytogenetic maps (c) physical maps (d) all of these

x. **Markers assisted selection help in _____.**
(a) crop improvement (b) seed purity (c) plant breeding (d) all of them

Q.2 **Answer any <u>TEN</u> from the following:** **[20]**

i. Write a short note on objective of plant breeding.
ii. What do you mean by germplasm? Write the importance of germplasms in plant breeding.
iii. Define gene pool and gene introgression.
iv. Write the importance of cross fertilization in plant breeding.
v. What do you mean by inbreed and clones?

vi. Differentiate between cross breeding and line breeding.
vii. Write the uses of Hardy Weinberg in population genetics.
viii. Write the importance of non random mating in plant genetics.
ix. Write a short note on rate of mutation.
x. Differentiate between SNP and AFLP.
xi. Write a short note on uses of molecular marker in breeding.
xii. How marker assistance help in crop improvement programmes.

Q.3 (a) Discuss the history, important achievements and opportunities of plants breeding. **[06]**

(b) Write a note on ICAR and IARI. **[04]**

OR

Q.3 (a) Explain the role of IPGRI and NBPGR in germplasm collection and its conservation. **[06]**

(b) Give an account of primary and secondary gene pool concept. **[04]**

Q.4 (a) Discuss the various genetics consequences of self fertilization in crop improvement. **[05]**

(b) Differentiated between cross breeding and line breeding with suitable examples. **[05]**

OR

Q.4 (a) Give a detail account on mutation breeding. **[06]**

(b) Define heterosis. Write a short note on inbreeding depression. **[04]**

Q.5 (a) State and explain Hardy weinberg law. **[10]**

OR

Q.5 (a) Explain in detail about factors affecting changes in allele and genotype frequencies. **[10]**

Q.6 (a) Give a detail account on: strategy of near isogenic line and bulk segregant analysis. **[10]**

OR

Q.6 (a) What do you mean by biochemical markers? Write the advantages of marker assisted selection in plant breeding. **[06]**

(b) Write a note on quantitative trait loci analysis. **[04]**

****