

M.Sc. (Ag.) Examination, 2016
Semester-III
Genetics and Plant Breeding
Course No.: GPB-511
(Breeding Cereals, Forages and Sugarcane)

Time: Three Hours

Full Marks: 50

Questions are of value or as indicated in the margin

A. Tick (✓) mark the appropriate answer (any ten):

1.0×10=10.0

1. Genome of which of the following crop is not completely sequenced?
A. Rice B. Maize C. Sorghum D. Wheat
2. Which of the following is a cross-pollinated crop?
A. Rice B. Wheat C. Ragi D. Alfalfa
3. Which of the following species of rice (*Oryza*) other than *O. sativa* is cultivated?
A. *Oryza rufipogon* B. *O. glaberrima*
C. *O. rhizomatis* D. *O. brachyantha*
4. The gametes of one of the following are polyploids
A. *Oryza nivara* B. *Agegilops squarrosa*
C. *Hordeum vulgare* D. *Triticum aestivum*
5. The center of origin of Sorghum is
A. S.E. Africa B. India C. China D. Mexico
6. The chromosome number (2n) of *Oryza sativa* is
A. 20 B. 24 C. 42 D. None
7. The key chemical responsible for aroma in rice is
A. 2-acetyl-1-pyrroline B. 1-acetyl-2-pyrroline
C. 2-amino-1-pyrroline D. None
8. The inflorescence of sugarcane is known as
A. Arrow B. Panicle C. Raceme D. None
9. The chromosome number (2n) of pearl millet (*Penisetum americanum*) is
A. 24 B. 14 C. 42 D. 32
10. Paras is a variety of
A. Maize B. Sorghum C. Bajra D. Ragi
11. Monosomic analysis have been extensively used for gene mapping and substitution line production in
A. Barley B. Soybean C. Ragi D. Wheat

P.T.O.

12. Sugarcane Breeding Institute is situated at
A. Lucknow B. Coimbatore C. New Delhi D. Hydrabad
13. In wheat, maize and rice
A. Perisperm is fused with seed coat B. Pericarp is fused with seed coat
C. Perisperm and seed coat are separate D. Pericarp and seed coat are separate
14. Tifton is a male sterile cytoplasm of
A. Jowar B. Bajra C. Rice D. Alfalfa

B. Answer *any four* questions.

10×4=40

1. What are the important quality traits of bread wheat? 5
Write down a short note on origin of bread wheat. 5
2. Discuss breeding for abiotic stress tolerance in rice. 5
Write down a short note on important quality traits of rice. 5
3. Discuss major breeding procedures for development of maize hybrids. 6
Briefly discuss breeding for stress tolerance in maize. 4
4. Briefly discuss objectives and challenges for sugarcane breeding. 5
Write in short the characteristics of important species of sugarcane. 5
5. Briefly discuss the use of male sterility in pearl millet breeding programmes. 5
Write down the major breeding objectives of sorghum. 5
6. Briefly discuss : (*any four*) 2.5×4=10
 - I. Problems in forage breeding
 - II. Pollination behaviour in forage legumes
 - III. Origin of cultivated rice
 - IV. Noblisation of sugarcanes
 - V. Evolution of maize
 - VI. Marcotting in sugarcanes
 - VII. New plant type in rice
7. Write down short note on the followings : (*any four*) 2.5×4=10
 - I. Golden rice
 - II. Quality Protein Maize
 - III. Ph locus
 - IV. Bt-maize
 - V. Gametocides in wheat
 - VI. Wheat genome diversity