QPC: RN22BSCAG162

Reg. No.										

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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

B. Sc (AG) (Fifth Semester) Examinations, November 2024

PBG-314- Crop Improvement I (Kharif crops)

Time: 2 hrs Maximum : 50 Marks

The figures in the right hand margin indicate marks.

PART – A

Q.1. Fill in the blanks with suitable word(s). (0.5 x 10 = 5 Marks)

a. The acronym Bt in Bt crops stands for *Bacillus* _____.
b. The manipulation of genes within a living organism is known as _____.
c. The acronym ICRISAT stands for the _____
d. The dihybrid cross ratio expected under Mendelian inheritance is _____.
e. Continuous variation in a population is often seen in _____ traits.
f. The phenomenon where a single gene influences multiple seemingly unrelated phenotypic traits is called_____.
g. The phenomenon of hybrid vigor, where the hybrid offspring outperform their parents, is also known as _____
h. The environment can contribute to phenotypic variation in quantitative traits through _____ factors.
i. Sorghum and Pearl millet are examples of crops with _____ origin.
j. Climate resilient crop varieties aim to withstand and adapt to various _____ stresses.

Q. 2. Define (or) Explain the following in one or two sentences (1 x 5 = 5 Marks)

a. Detasseling
b. Primary centre of origin
c. Ideotype Breeding
d. Emasculation
e. Isolation Distance

Q3. Choose the correct option. (0.5 x10= 5 Marks)

a) Male sterile line _____ of Bajara was highly susceptible to Ergot disease.
   a) Tift 29B ii. Tift 23A iii. Tift 23B iv. Tift 20A
b) Which of the following are the mutant of Maize?
   i. Atlas 66 ii. Opaque 2 iii. Notch 1 and Notch 2 iv. ZEM 1
c) *Zea mays* ssp. _____ is the progenitor of maize.
   i. *mexicana* ii. *americana* iii. *parviglumis* iv. *hiproly*
d) Which of the following region is not suitable for hybrid seed production of rice?
   i. Hilly region ii Coastal region iii. lateritic region iv. all of these
e) In large scale hybrid rice production the row ratio should be _____.
   i. 2:4 ii. 2: 8 iii. 2:3 iv. 2:5
f) Primitive cultivars which were selected and cultivated by the farmers for many generations without systematic plant breeding efforts are known as_____.
   i. Obsolete variety ii. Modern cultivars iii. Wild relatives iv. Land races
g) Intermating is easy in _____

i. GP1 ii. GP2 iii. GP3 iv. GP3

h) Hulling and milling recovery is an important quality trait for _____ crop.

i. Rice ii. Cotton iii. Carrot iv. Sunflower

Q4. Write True or False against each statement (0.5 x 10 = 5 Marks)

a. Resistance breeding aims to develop crop varieties with increased susceptibility to diseases.
b. The pedigree method in crop improvement involves the systematic selection of desirable individuals over several generations based on their family history.
c. Breeding objectives for hybrid rice seed focus on maintaining genetic diversity within the hybrid population.
d. In the context of redgram improvement, the selection for disease resistance may involve the use of molecular markers.
e. Embryo rescue is a technique used to overcome barriers in interspecific or intergeneric crosses during crop breeding.
f. Sesame (Sesamum) is predominantly a cross-pollinated crop, making it suitable for hybrid seed production.
g. Heterozygosity is a characteristic trait of pureline breeding in crop improvement.
h. Inbred lines are typically more genetically diverse than hybrid varieties.
i. Seed certification is a process that guarantees a seed lot's genetic purity but does not consider its physical and physiological quality.
j. Genomic selection involves predicting the genetic merit of individuals based on their entire genome, rather than specific marker-assisted selection.

PART – B

Attempt *ANY FIVE* questions. All question carries equal marks (6 x 5 = 30 Marks)

5. What is nutritional quality? Explain the important nutritional qualities to be considered while breeding of kharif cereals and pulses.
6. Suppose you are a Pigeonpea breeder at ICRISAT. You want to develop a new variety with conventional backcross breeding method. What will be your basic objectives in this context? Mention the different steps of emasculation in pigeon pea.
7. As a sesame breeder, what will be your basic breeding objectives to develop seed and seedling characters through pedigree method. What is the amount of oil in sesamum?
8. When you will be going to choose backcross-pedigree breeding method? Give an example.
9. Describe the important concept of breeding in self-pollinated crops.
10. Explain the hybrid seed production technology for hybrid rice seed.

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