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SEMESTER END THEORY EXAMINATION
B. Sc. (Hons) Agriculture

Semester	**:**	**V (New)**		**Academic Year**	**: 2021-22**
Course No.	**:**	**GPB-355**	**Title**	**:**	**Crop Improvement (Kharif crop)**
Credit	**:**	**2(1+1)**			
Day & Date	**:**	28.11.2021	**Time :**	**Total Marks**	**: 40**

Note: 1. Solve **ANY FOUR** questions from **SECTION "A"**.
2. Solve **ANY SIX** questions from **SECTION "B"**
3. All questions from **SECTION "C"** are compulsory.
4. Send PDF file of answer sheet to the email ID of respective course teacher.

SECTION "A"

(Write the answers in 4-5 sentences only. Each question carries 4 marks)

Q.1 Define Gene Pool. Give its types.

Ans: Gene Pool: Gene pool consists of all the genes and their alleles present in all individuals which can hybridize with each other.

Types of gene pool :

Primary gene pool (GP1) : It includes plants of the same species or of closely related species which produce completely fertile offspring on intermating

Secondary gene pool (GP2) : The genetic material that leads to partial fertility on crossing with GPI is referred to as secondary gene pool.

Tertiary gene pool (GP3) : The genetic material which leads to production of sterile hybrids on crossing with primary gene pool is termed as tertiary gene pool. It includes material which can be crossed with GP1, but the hybrids are sterile.

Q.2. Define Pedigree method of breeding. Enlist any four t breeding methods for self pollinated crops

Ans:Pedigree method: It is a selection procedure in segregating population of self pollinated species that keeps proper record of plants and or progeny selected in each generation.

Plant breeding methods that are used for genetic improvement of self pollinated or autogamous species include:

1. Plant Introduction
2. Pureline selection
3. Mass selection
4. Pedigree method
5. Bulk method
6. Single seed descent method

Q3. Define Pollination. Enlist different mechanisms of promoting self pollination.

Pollination: It refers to the transfer of pollen grains from anthers to stigmas.

Mechanisms promoting self pollination:

1. Cleistogamy
2. Chasmogamy
3. The position of anthers in relation to stigmas ensure self pollination.
4. In some species , flowers open but the stamens and stigmas are hidden by other floral parts.
5. In few species stigmas become receptive and elongate through stamina columns.

Q.4 Give any four steps of production of somatic hybridization.

Ans: somatic hybridization :Development of hybrid plants through the fusion of somatic protoplasts of two different plant species/varieties is called somatic hybridization.

Steps In Somatic hybridization technique:

1. Isolation of Protoplasts
2. Fusion of the protoplasts of two desired dpecies/varieties
3. Identification and selection of somatic hybrid cells
4. Culture of the hybrid cells
5. Regeneration of the hybrid plants

Q.5 Give any four applications of transgenic plants in crop improvement.

Ans: 1. Transgenes will be important in increasing the efficiency of crop production systems.
2. It is an effective means of including male sterility in crop plants.
3. Transgenic plants which are stable for food processing have also been produced.
4. Several gene transfers have been aimed in improving the produce quality e.g. protin and lipid quality.

SECTION "B"

(Write the answers in one sentence only. Each question carries 2 marks)

Q.6: Do as directed (Any Six)

a). What do you mean by modifying gene.p

Ans:Modifying gene: Genes that have no phenotypic effect of their own but change the expression of some oligogene

b) Define germplasm.

Ans: Germplasm: Germplasum may be defined as sum total of hereditary material .

c). What is the planting ratio required for certified seed production in hybrid maize.

Ans: The planting ratio required for hybrid maize is 2 lines of male parent and 6 lines of female parent.

d). What is marker assisted selection.

Ans: Marker assisted selection: Marker-assisted selection (MAS) is a method of selecting desirable individuals in a breeding scheme based on DNA molecular **marker** patterns instead of, or in addition to, their trait values.

e). Define Genetic erosion.

Ans: . Genetic erosion: gradual dissappearence of various forms of cultivated species and of its wild relatives.

f). What is the botanical name of pomegranate.

Ans: The botanical name of pomegranate is **Punica granatum.**

g). What is drought escape.

Ans: Drought escape: it is due to ability of genotype to mature early, before occurance of drought

SECTION "C"

(Choose the correct option. Each question carries 1 marks)

Q.7 **Choose the correct option. Each question carries 1 marks**

1 Multiplication of plants without the fusion of male and female gametes is known as

[a] Asexual reproduction [b] Sexual reproduction

[c] Fertilization [d] Sporogenesis

2 The chromosome number of soyabean is

[a] 2n= 40 [b] 2n= 20

[c] 2n= 14 [d] 2n= 24

3 The example of resistance to Helicoverpa transferred from soil born bacterium bacillus thurengenesis by Monsato company in crop

[a] Cotton [b] Jowar

[c] Pigeonpea [d] G. Nut

4 A method of crop improvement which is used to enhance genetic yield potential through modifying individual plant characters to optimum level

[a] Ideotype Breeding [b] Pedigree method

[c] Hybridization [d] Introduction

5 Plants or cells which containing nucleus of one species but cytoplasm of both the parental species is known as

[a] Cybrids [b] Hybrids

[c] Isogenic lines [d] Recombinant

6 Origin of Ground nut is

[a] **Brazil** [b] India

[c] America [d] Africa

7 Progeny of single homozygous plant of self pollinated species is called as

[a] Pure line [b] Hybrid

[c] Composite [d] Bulk

8 It deals with the inheritance of traits of kind viz: form, structure, color etc. is known as

[a] Qualitative Genetics [b] Quantitative genetics

[c] Segregation [d] Mutation

9 Refers to the ability of plants to prevent, reduce or overcome injurious effects of soluble salts present in their root zone.

[a] Salt Tolerance [b] Disease Resistance

[c] Self imcompability [d] Mutation

10 The wild species of jowar is

[a] **Sorghum Sudanenense** [b] Cajanus cajan

[c] Oriza sativa [d] Pennisetum mollissimum

11 Origin of Castor is

[a] Brazil [b] India

[c] Ethiopia [d] Africa

12 Cajanus cajan is the botanical name of

[a] Rice **[b] Pigeonpea**

[c] Maize [d] Cotton