



FIJI NATIONAL UNIVERSITY

College of Agriculture, Fisheries & Forestry

School of Agricultural Sciences & Forestry

Department of Crop Production

Bachelor Science in Agriculture - Year III

Final Examination

Trimester I - 2018

GPB 702: PRINCIPLES OF PLANT BREEDING

Time Allowed: 3.00 hours

Total Marks: 100

INSTRUCTIONS:

1. This question paper consists of SIX pages including two pages of Answer Sheet.
2. Verify thoroughly whether the given *question paper* is *complete in all style*.
3. Answer all the *objective type questions on the answer sheet* provided with question paper (Page 5 & 6). Then, the *answer sheet* should be tied with main *answer booklet*.
4. Answer all the *descriptive type questions on the answer booklet*.
5. No written or printed materials and mobile phones are allowed in the examination hall
6. **Marks allocated** for each question appears at the side of each question, so allocate your time accordingly.
7. Do mention the **same question number** of the question you're going to answer in the answer script.
8. This paper is divided into Two Parts. First Part contains **Objective Type Questions** which is having three Sections – A, B, C & D. All questions of First part is compulsory. Second part is **Descriptive Type** which is having three sections E, F & G, and can select your choice.

I. OBJECTIVE TYPE QUESTIONS (40 Marks)

To be answered only on the Answer Sheet (provided with question paper).

Section A	: Choose the best answer.	(10 Marks)
Section B	: Fill in the blanks.	(10 Marks)
Section C	: Match the following.	(10 Marks)
Section D	: True or False	(10 Marks)

II. DESCRIPTIVE TYPE QUESTIONS (60 marks)

There are **Six (6)**, questions are provided on Section E & F, attempt any **Five (5)** as per your choice. In section G, **Three (3)** questions are provided and attempt any **Two (2)** of your select. Write all the descriptive answers only on the **Answer Booklet**.

Section E	: Define the following.	(15 Marks)
Section F	: Short Description.	(25 Marks)
Section G	: Essay question.	(20 Marks)

I. OBJECTIVE TYPE QUESTIONS

Note: To be answered only on the ANSWER SHEET provided with QUESTION PAPER.

A. Fill in the blanks.

(10 x 1 = 10 Marks)

- _____ is a science based on principles of genetics and cytogenetics.
- Pollen grains developed from _____ layer of pollen sac.
- The transfer of pollen grains from the anther to the stigma is called _____.
- _____ are living genetic resources such as seeds or tissues
- _____ is the total number of genes and alleles in a sexually reproducing population.
- _____ refers to how common an allele is in a population.
- _____ is the adaptation of an individual plant under the changed climate.
- _____ may result in appearance of many harmful characters due to recessive alleles.
- The mutations are used to get the new character or _____ genetic variability.
- _____ are primitive cultivars which were selected and cultivated by farmers

B. Multiple choice questions

(10 x 1 = 10 Marks)

- The first artificial interspecific plant hybrid was made by _____.
a. Thomas Cook b. Thomas Fairchild
c. Thomas Fischer d. Thomas Leone
- The _____ lies dormant in the seed.
a. cotyledon b. endosperm
c. radicle d. embryo
- Cross Pollination can also be called as _____.
a. allogamy b. heterogamy
c. apospory d. herkogamy
- The carpels get matured earlier than the anthers of a flower are called _____.
a. herkogamy b. protandry
c. apogamy d. protogyny
- _____ seeds do not survive drying and freezing.
a. Endospermic b. Non- Endospermic
c. Recalcitrant d. Non- Recalcitrant
- _____ is a change in the frequency of alleles occurring in a short time period.
a. Macroevolution b. Allele frequency
c. Microevolution d. Mutation
- A group of plants all obtained from a single self-fertilized homozygous plant are _____.
a. inbreed lines b. purelines
c. hybrid lines d. none of the above

18. Which mechanical method and is suitable for the crops having minute flowers?
 a. Inoculation b. Suction
 c. Hybridization d. Emasculation
19. The selection of a number of phenotypically superior plants is _____.
 a. mass selection b. bulk selection
 c. pedigree selection d. none of the above
20. The pollination with the help of wind is called _____.
 a. chiropteriphily b. malcophily
 c. anemophily d. none of the above

C. Match the following:*(10 x 1 = 10 Marks)***PART - A****PART-B**

- | | |
|---------------------------|---|
| 21. Microsporophylls | A. Reduced biological fitness |
| 22. Apospory | B. Breeding is impossible if not there |
| 23. Herkogamy | C. Wild species to cultivated plants. |
| 24. Germplasm | D. Excessive expression of temporary vigour |
| 25. Statistics | E. Embryo develop from embryo sac |
| 26. Hybrid Vigour | F. Physical barriers stops the pollination |
| 27. Inbreeding depression | G. Bagging and pollination is incomplete |
| 28. Luxuriance. | H. Stamen produce pollen in anther |
| 29. Domestication | I. Synonym of heterosis |
| 30. Tagging | J. Indispensable in plant breeding |

D. True or False:*(10 x 1 = 10 Marks)*

31. The floral biology research is sometimes termed as anthecology.
32. Recurrent apomixis have meiotic division.
33. Pollination takes place with the help of bats it is called malacophily.
34. Wild relatives are important sources of resistance to biotic and abiotic stresses.
35. Plant breeders may artificially induce mutation to generate new variability of crops.
36. Hybrid vigour describes about the superiority of the hybrid over other crosses.
37. Self-incompatibility means the plants do produce viable pollens.
38. The emasculated flowers are immediately covered by paper is tagging
39. Breeders develop new cultivars by modifying the genetic structure of the base population.
40. Androecium consists of megasporophyll's or male organ

II. DESCRIPTIVE TYPE QUESTIONS

Note: To be answered only in the ANSWER BOOKLET.

E. Attempt Any FIVE Questions**(5 x 3 = 15 Marks)**

Analyze the below terms and provide information

41. Domestication and Acclimatization
42. Apomixis and Amphimixis
43. Genetic Vulnerability and Genetic erosion
44. Emasculation and Selfing Methods
45. Micro and Mega - Sporophylls
46. Single and double cross hybrids

F. Attempt Any FIVE Questions (1 Page each).**(5 x 5 = 25 Marks)**

Apply the knowledge and provide suitable answers for the following:

47. Aim, objective, significance and importance of plant breeding in agriculture
48. Procedure for Mass Selection
49. Source of germplasm or germplasm classification
50. Heterosis and its types
51. Inbreeding depression and hybrid vigour
52. Steps to find the allele frequency by Hardy-Weinberg Equilibrium

G. Essay question - Attempt Any TWO Questions (2 Pages each).**(2 x 10 = 20 Marks)**

Demonstrate with diagrams and provide relevant explanations for the following

53. Steps in male and female gametophyte formation with diagram.
54. Hybridization method of crop improvement
55. Pure line theory, Johannson's pure line theory & Procedure for Pure line selection.

The End

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I. Objective Type Questions - Answer Sheet

Total Marks: 40

A.	1.	
	2.	
	3.	
	4.	
	5.	
	6.	
	7.	
	8.	
	9.	
	10.	

B.	11.	
	12.	
	13.	
	14.	
	15.	
	16.	
	17.	
	18.	
	19.	
	20.	

C.	21.	
	22.	
	23.	
	24.	
	25.	
	26.	
	27.	
	28.	
	29.	
	30.	

Student ID No.....

Date:

D.	31.	
	32.	
	33.	
	34.	
	35.	
	36.	
	37.	
	38.	
	39.	
	40.	

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