University Seat No. : _____ Center: _____

Registration No. : _____ Sign. of Supervisor _____

AGRICULTURAL UNIVERSITIES OF GUJARAT

1. Anand Agril. University, Anand
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Sixth Semester End Examination of B.Sc. (Hons.) Horticulture (Regular)-June,2017

Part-A : Objective

Course No. : FLR. 6.4 **Title of Course :** Breeding and Seed Production of Ornamental crops **(2+1)**

Date & Day: 14-06-2017, Wednesday **Time :** 9.30 to 10.15

Total Marks: 40 **Marks Obtained:**

Q.1: Tick mark (√) most appropriate option from the following

1. Mutation term is coined by.....
   A) Hugo de Vries (1900) B) Mendel (1914)
   C) Muller (1946) D) Shull (1964)
2. Cross pollination increases.....
   A) Homozygosity B) Homogenity
   C) Heterozygosity D) Heterogenity
3. Head office for Indo American Hybrid seeds (India) Pvt. Ltd. is situated at.....
   A) Lucknow B) Kolkata
   C) Bengluru D) New Delhi
4. The plant affected by a disease is known as.....
   A) Host B) Pathotype
   C) Pathogen D) Race
5. 'Pusa Arpita' has been developed through..... in French marigold.
   A) Mutation B) Introduction
   C) Selection D) Hybridization
6. The classical term heterosis coined by.....
   A) Mendal (1865) B) Shull (1914)
   C) Shull and Hull (1920) D) Hull (1951)
7. Comparison of hybrid to performance of best parent/high parent is known as.....
   A) Average heterosis B) Mid parent heterosis
   C) High parent heterosis D) Standard Heterosis
8. Varieties like Kamini, Poornima, and Violet Cushion have been developed in.....
   A) China aster B) Gladiolus
   C) Marigold D) Jasmine
9. .....a major disease of roses that causes severe losses to commercial production.
   A) Red spot B) Yellow spot
   C) black spot D) Rust

(P.T.O)

10. The progeny of a single self pollinated plant in cross pollinated crops is known as.....
A) Inbred line B) Outbreed line
C) Female line D) Male line

11. *Antirrhinum* belongs to family.....
A) Asteraceae B) Rosaceae
C) Malvaceae D) Scrophulariaceae

12. Ethyl methane Sulphonate is an example of.....mutagen.
A) Alkylating agents B) Acridine dyes
C) Base analogous D) Physical mutagen

13. Longest storage life in seed is .....years
A) <1 B) 1-2
C) 3 D) More than three

14. .....is a father of rose breeding.
A) B. P. Pal B) R. K. Roychaudhary
C) B.S. Bhattacharji D) M.N. Hardikar

15. 'Pusa Tara' variety of coreopsis is developed through.....
A) Spontaneous mutation B) Selection
C) Induced mutation D) Distant Hybridization

16. Hybrid variety 'Prima Donna' was first hybrid of.....
A) Petunia B) Marigold
C) Begonia D) Gerbera

17. 'Shobha' variety of gladiolus was released from
A) IARI B) IIHR
C) TNAU D) PAU

18. Removal of off type plants from seed production block is known as.....
A) Cleaning B) Emasculation
C) Rouging D) Weeding

19. New germplasm is introduced through.....
A) IARI B) NBPGR
C) ICAR D) NBRI

20. 'Pansy' belongs to family.....
A) *Asteraceae* B) *Rosaceae*
C) *Solanaceae* D) Violaceae

21. 'Delhi Princess' variety of rose belongs to ..... group.
A) Floribunda B) Grandiflora
C) Hybrid Tea D) Miniature

22. .....is Fusarium wilt resistant variety of Gladiolus.
A) Dhiraj B) Mohini
C) Phule Neelrekha D) White Friendship

23. Pin and Thrum type flowers are observed in.....
A) Gaillardia B) Hibiscus
C) Jasmine D) Rose

24. Shape of pollen grains of *Hibiscus rosa sinensis* is.....
A) Octaporate B) Pentaporate
C) Quadraporate D) Tetraporate

25. .....technique is used in case of embryo abortion.
A) Anther culture B) Cell suspension culture
C) Embryo rescue D) Protoplast culture

26. A cross between *Dianthus caryophyllus* and *D. chinensis* resulted in ..... carnations.
A) Malmasion B) Marguerite
C) Perpetual D) William Sim

27. .....refers to adaptation or adjustment of an introduced variety to the new environment.
A) Acclimatization B) Domestication
C) Introduction D) Selection

28. The restorer line is represented as.....
A) A- line B) B- line
C) R- line D) D-line

29. Time of anthesis in gladiolus is.....
A) 2 am to 10 am B) 6 am to 8 am
C) 8 am to 2 pm D) 2 pm to 8 pm

30. 'Alipore Beauty' is a variety of.....
A) Bougainvillea B) Crossandra
C) Hibiscus D) Marigold

31. 'Archana' and 'Arun' are..... varieties of gladiolus.
A) Aneuploid B) Diploid
C) Polyploid D) Triploid

32. Continuously flowering variety of tuberose is .....
A) Arka Nirantra B) Prajwal
C) Rajat Rekha D) Swarna Rekha

33. ..... species of Hibiscus is also known as Persian rose.
A) *H. rosa-sinensis* B) *H. schizopetalus* Hook
C) *H. mutabilis* L D) *H. syriacus* L

34. CO-1 Pitchi is developed from..... by clonal selection method at TNAU.
A) *J. auriculatum* B) *J. grandiflorum*
C) *J. pubescence* D) *J. sambac*

35. ..... species of Hibiscus is also known as 'changeable rose'.
A) *H. rosa-sinensis* B) *H. schizopetalus* Hook
C) *H. mutabilis* L D) *H. syriacus* L

36. 'Basant' variety of Hibiscus was developed through.....
A) Introduction B) Selection
C) Hybridization D) Mutation

37. Maximum oil recovery is obtained from .....species of jasmine.
A) *J. auriculatum* B) *J. grandiflorum*
C) *J. pubescence* D) *J. sambac*

38. ..... is also known as French Jasmine.
A) *J. auriculatum* B) *J. grandiflorum*
C) *J. pubescence* D) *J. sambac*

(P.T.O)

39. Haploid chromosome number of Jasmine is……..
A) n=10 B) n=11
C) n=12 D) n=13
40. Yellow flower colour is present in which species of Jasmine?
A) *J. auriculatum* B) *J. humile*
C) *J. pubescence* D) *J. angustifolium*
41. B.B.S. Bhadri is a famous breeder of ……crop.
A) Chrysanthemum B) Gerbera
C) Gladiolus D) Rose
42. The cause for cross pollination in tuberose is ……
A) Dichogamy B) Homogamy
C) Monoecy D) Male sterility
43. Variety 'Swarna Rekha' is developed from…….
A) IARI,New Delhi B) IIHR, Bengaluru
C) NBRI, Lucknow D) IHBT,Palampur
44. Shubhangini variety of gladiolus is developed through……
A) Introduction B) Selection
C) Hybridization D) Mutation
45. Which species of Rose has 'Goleden yellow' flower colour?
A) *Rosa gallica* B) *Rosa foetida*
C) *Rosa indica* D) *Rosa damascena*
46. Centre of origin of 'Chrysanthemum' is…….
A) China B) Mexico
C) Japan D) India
47. 'Pusa Shankar- 1' variety of marigold is developed through
A) Introduction B) Selection
C) Hybridization D) Mutation
48. ……belongs to Scrophulariaceae family.
A) Snapdragon B) Sword lily
C) Gazania D) Phlox
49. *'Sinningia speciosa' is botanical name of……*
A) Calendula B) Pansy
C) Gloxinia D) Phlox
50. The cross ms ms x Ms ms will segregate as…… ratio.
A) 1 Fertile: 1 Sterile B) 1 Fertile: 3 Sterile
C) 3 Fertile: 1 Sterile D) 9 Fertile: 7 Sterile
51. ……is a male sterile line in sun flower.
A) Sunrich Orange B) Surajmukhi
C) Double Orange D) Sun Rise
52. Isolation distance for maintaining pure seed of self-pollinated crop is……..
A) 5-10m B) 25-50m
C) 50-100m D) >100m

53. For precision planting..... is necessary.
A) Seed cleaning B) Seed sizing
C) Seed pelleting D) Seed packaging

54. In ..... family anthers are modified to form ray florets.
A) Asteraceae B) Compositae
C) Both a and b D) Acanthaceae

55. The permissible genetic impurity in certified seeds is.....
A) 1-5 % B) 0-1%
C) 1-2% D) 2-5%

56. In *Tagetes* .....facilitates efficient and economic hybrid seed production.
A) GMS B) CMS
C) CGMS D) TGMS

57. Hollyhock, antirrhinum, verbena and calendula are.....plants.
A) Outbreeders B) Inbreeders
C) Often cross pollinated D) Male sterile

58. In Gujarat seed production is responsibility of .....
A) GSSC B) GSSCA
C) GNFC D) MSSC

59. 'International Registration Authority for Bougainvillea Cultivars' is at.....
A) NBRI B) IARI
C) TNAU D) IHBT

60. AICRP on flower crops was initiated in the year.....
A) 1964 B) 1966
C) 1972 D) 1976

61. For basic seed cleaning .....machine is used.
A) Air screen machine B) Specific gravity separator
C) Sonic sieve D) Magnetic separator

62. 15°C temperature is required for..... during storage.
A) *Delphinium* B) *Gerbera jamesonii*
C) *Phlox drumondii* D) *Tagetes erecta*

63. Which of the following cultivars of rose is not developed through mutation at IARI?
A) Madhosh B) Arjun
C) Pusa Christina D) Abhisarika

64. ..... Is a 'no pinch no stake' cultivar of chrysanthemum.
A) Birbal Sahani B) Baggi
C) Indira D) Guldasta

65. 'Arka Flame' variety of carnation is developed through .....breeding.
A) Somaclonal variation B) *In vitro* mutation
C) Anther culture D) Embryo rescue

66. 'Mary Palmer' is an important cultivar of.....
A) Aster B) Bougainvillea
C) Jasmine D) Gladiolus

(P.T.O)

67. NRC Orchids is located at.....
A) Ganeshkhind, Pune
B) CIHF, Shilong
C) Gangtok, Sikkim
D) Jorhat, Assam

68. 'Arka Tejas' is a ..... hybrid of carnation .
A) Intervarietal
B) Intergeneric
C) Interspecific
D) Intraspecific

69. In chrysanthemum mutant variety 'Sonar Bangla' is developed from.....
A) Sharad Shobha
B) Snow Ball
C) Pink Cloud
D) White Cloud

70. .....is the pigment responsible for blue colour in rose.
A) Cynidin
B) Pelargonidin
C) Delphinidin
D) Lutin

71. ..... is a triploid variety of marigold.
A) Pusa Shankar-1
B) Pusa Arpita
C) Red Gold
D) Nugget

72. .....a trisomic variety of rose.
A) Madhosh
B) Gulzar
C) Mohini
D) Abhisarika

73. .....certificate is issued during plant quarantine.
A) Monitoring
B) Quarantine
C) Phyto-sanitary
D) Evaluation

74. Foundation seed class has.....colour tag.
A) Azure Blue
B) Golden Yellow
C) Opel Green
D) White

75. Calculate the possible number of crosses in half-diallel if n=10.
A) 40
B) 45
C) 50
D) 55

76. Calculate high parent heterosis % with following data p1=14, p2=20, F1=22.
A) 10.0%
B) 37.4%
C) 57.1%
D) 64.7%

77. ..... is harvesting stage of chrysanthemum seeds.
A) Almost all flower heads dry
B) Flower heads become fussy
C) Capsule turns brown
D) Whole plant tried

78. Among different operations, the date comes first is.....
A) Date of pollination
B) Date of emasculation
C) Date of fertilization
D) Date of harvesting

79. 'Dr. R.R Pal' is a root stock of.. .....
A) Bougainvillea
B) Hibiscus
C) Jasmine
D) Rose

80. 'Progeny test' is developed by.....
A) Davenport
B) Johannsen
C) Miller
D) Vilmorin

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Sixth Semester End Examination of B.Sc.(Hons.) Horticulture (Regular)-June,2017

Part-B : Subjective

Course No. : FLR. 6.4 **Title of Course** : Breeding and Seed Production of Ornamental crops **(2+1)**

Date & Day: 14-06-2017, Wednesday **Time** : 10.15 to 12.00 **Total Marks:** 40

Q. 1 A Define/ Explain (Any five) **5.0**

1. Self incompitability
2. Seed pelleting
3. Quarantine
4. Genetic engineering
5. Complex cross
6. Vertical resistance

B Discuss in detail breeding objectives, hybridization procedure and varietal improvement in tuberose. **5.0**

Q. 2 Answer the following in brief (Any ten) **10.0**

1. Breeding approaches for disease resistance in ornamental crops.
2. Enlist steps in pollination management.
3. Enlist important species of Jasmine.
4. Enlist merits and demerits of mutation.
5. Varieties developed at IIHR for China Aster.
6. Enlist biotechnological techniques used in ornamental crop breeding.
7. Types of hybridization.
8. Estimation of heterosis.
9. Enlist hybrid seed producing companies of India.
10. Characteristics of maintainer line.
11. Types of emasculation.
12. Enlist different species of Rose.

(P.T.O.)

Q.3 A Differentiate the following (Any four) **4.0**

1. Heterosis vs. inbreeding depression
2. Cytoplasmic male sterility vs. Gametophytic male sterility
3. Spontaneous vs. induced mutation
4. Mass selection vs. clonal selection
5. Primary vs. secondary introduction

B Write short notes (Any two) **6.0**

1. Seed processing
2. Varietal improvement in Hibiscus
3. Classification of *mutagens*
4. Double flower condition

Q.4 A Answer the following in detail (Any one) **5.0**

1. Steps involved in plant introduction.
2. Varietal improvement in rose.

B Furnish the information on following crops **5.0**

Crop	Botanical name	Family	Centre of Origin	Mode of pollination	Mode of reproduction
China aster					
Gladiolus					
Chrysanthemum					
Carnation					
Bougainvillea					

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