Roll No. .....

Question Booklet Number

O. M. R. Serial No.

M. Sc. (Ag.) Genetics and Plant Breeding

(First Semester) EXAMINATION, 2021-22

PRINCIPLES OF CYTOGENETICS

Paper Code				
GP	5	0	0	2

Questions Booklet Series
B

Time : 1:30 Hours] [*Maximum Marks : 100*

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 60 questions. Examinee is required to answer any 50 questions in the OMR Answer-Sheet provided and not in the question booklet. If more than 50 questions are attempted by student, then the first attempted 50 questions will be considered for evaluation. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 60 प्रश्न हैं। परीक्षार्थी को किन्हीं 50 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। यदि छात्र द्वारा 50 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 50 उत्तरों को ही मूल्यांकन हेतु सम्मिलित किया जाएगा। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page) (शेष निर्देश अन्तिम पृष्ठ पर)

(Only for Rough Work)

1. Which is the correct sequence in cell cycle ?

(A) S-G_2-G_1-M

(B) G_1-S-G_2-M

(C) G_2-S-G_1-M

(D) M-S-G_1-M-G_2

2. The morphology of chromosome is best studied at :

(A) Prophase

(B) Anaphase

(C) Metaphase

(D) Telophase

3. Genes are arranged in chromosome in :

(A) Spiral fashion

(B) Coiled manner

(C) Linear fashion

(D) None of the above

4. Which stain gives purple colour to chromosome ?

(A) Methyl blue

(B) Safranin

(C) Formalin

(D) Acetocarmine

5. During cell division, which cell organelle divides first ?

(A) Nucleus

(B) Cytoplasm

(C) Mitochondria

(D) Centriole

6. Which of the following will be sterile ?

(A) Tetraploid

(B) Diploid

(C) Triploid

(D) None of the above

7. In ..... the additional chromosome segment located just of the normal segment.

(A) Reverse tandem duplication

(B) Tandem duplication

(C) Displaced duplication

(D) None of the above

8. In which of the following structural chromosomal changes, the chromosome segment rotates by 180° ?

(A) Inversion

(B) Deletion

(C) Duplication

(D) Translocation

9. The chromosome doubling effect of colchicine was first described by :

(A) Blackeslee and Nebel

(B) U. Nagaharu

(C) Rimpau

(D) Karphenko

10. Which of the following is a simplex tetraploid ?

(A) Aaaa

(B) AAaa

(C) AAAa

(D) aaaa

11. In human being, how many pair of chromosomes have secondary constriction ?

(A) 2

(B) 3

(C) 5

(D) 4

12. ..... is responsible for structural integrity and individuality of chromosome.

(A) Centromere

(B) Chromomere

(C) Satellite

(D) Telomere

13. ..... is related to NOR.

(A) Spindle fibers

(B) Centromere

(C) Telomere

(D) Secondary constriction

14. Chromosome movement during cell division is due to :

(A) Telomere

(B) Centromere

(C) NOR

(D) None of the above

15. Chromatids of a chromosome are called as :

(A) Sister chromatids

(B) Non-sister chromatids

(C) Identical chromatids

(D) Brother chromatids

16. Who introduced the term Lampbrush chromosome ?

(A) Walther Flemming

(B) T. H. Morgan

(C) Ruckert

(D) Balbiani

17. Lampbrush chromosomes are the most distinctly observable during :

(A) Pachytene

(B) Zygotene

(C) Diplotene

(D) Leptotene

18. Chromosomes discovered in dipteran salivary glands :

(A) 'B' chromosome

(B) Polytene chromosome

(C) Lampbrush chromosome

(D) 'A' chromosome

19. Study of banding pattern of chromosome helps in :

(A) Identification of individual chromosome

(B) Identification of structural chromosomal changes

(C) Assigning various linkage groups to specific chromosome

(D) All of the above

20. In ideogram chromosomes ordered in a series of :

(A) Decreasing size

(B) Increasing size

(C) Both decreasing size and increasing size

(D) None of the above

21. Chromosomes are fully extended and uncoiled during :

(A) Prophase

(B) Metaphase

(C) Interphase

(D) Anaphase

22. DNA replication takes place during :

(A) G_1 -phase

(B) 'S'-phase

(C) G_2 -phase

(D) G_0 -phase

23. In mitosis centromere is divided at :

(A) Metaphase

(B) Prophase

(C) Anaphase

(D) Telophase

24. Non-dividing cells remain in :

(A) Anaphase

(B) Telophase

(C) Interphase

(D) Prophase

25. Daughter cells obtained after mitosis have :

(A) Same chromosome number as parent cell.

(B) Same kind of chromosome as parent cell.

(C) Both (A) and (B) are correct.

(D) (A) is correct but (B) is not correct.

26. Daughter cells produce during meiosis, mature in :

(A) Gametes

(B) Zygote

(C) Embryo

(D) None of the above

27. Synaptonemal complex is absent in :

(A) Female Drosophila

(B) Housefly

(C) Male Drosophila

(D) Honeybee

28. What is true about meiosis ?

(A) Gametes are produced.

(B) Constant and definite chromosome number of a species is maintained.

(C) Create genetic variation in population.

(D) All of the above

29. Meiosis is also known as :

(A) Homotypic division

(B) Heterotypic division

(C) Equational division

(D) None of the above

30. Which of these first structural chromosomal aberration was detected ?

(A) Duplication

(B) Inversion

(C) Deletion

(D) Translocation

31. Which of the following is a structural chromosomal change ?

(A) Monosomic

(B) Trisomic

(C) Nullisomic

(D) Inversion

32. In ..... gene sequence is changed.

(A) Inversion

(B) Deletion

(C) Duplication

(D) Translocation

33. Which of the following is a less deleterious structural chromosomal change ?

(A) Deletion

(B) Duplication

(C) Inversion

(D) Translocation

34. A recessive allele expresses itself in hemizygous condition, then this phenomenon is known as :

(A) Dominance

(B) Overdominance

(C) Incomplete dominance

(D) Pseudodominance

35. In ..... a chromosome segment integrates into a non-homologous chromosome.

(A) Translocation

(B) Deletion

(C) Duplication

(D) Inversion

36. In ..... two non-homologous chromosomes exchange the segments.

(A) Simple translocation

(B) Shift translocation

(C) Reciprocal translocation

(D) None of the above

37. Translocation was discovered by :

(A) C. B. Bridges

(B) Plankett

(C) Belling

(D) Casperson

38. ..... discovered balanced lethal system in Oenothera.

(A) W. Fleming

(B) Renner

(C) Balbiani

(D) Bateson

39. Individual with basic chromosome number is known as :

(A) Monohaploid

(B) Allomonoploid

(C) Monoploid

(D) None of the above

40. A monoploid is represented by :

(A) n

(B) x

(C) Both n and x

(D) None of the above

41. Polyploid species which have identical genomes, is called as :

(A) Amphidiploids

(B) Segmental allopolyploids

(C) Allopolyploids

(D) Autopolyploids

42. Plants obtained after the chromosome doubling by colchicine is called :

(A) Dihaploid

(B) Doubled haploid

(C) Haploid

(D) Monoploid

43. An alien addition monosome may have chromosome number :

(A) $2n + 1 + 1$

(B) $2n + 1 - 1$

(C) $2n + 2$

(D) $2n + 1$

44. Which of the following is an allotetraploid ?

(A) *Brassica juncea*

(B) *Brassica campestris*

(C) *Brassica nigra*

(D) *Brassica oleracea*

45. Man-made cereal crop is :

(A) Wheat

(B) Maize

(C) Rice

(D) Triticale

46. Study of relationship of specific gene with specific chromosome is called as :

(A) Genetics

(B) Cytology

(C) Cytogenetics

(D) None of the above

47. What is not true about 'B' chromosome ?

(A) Not found in all individuals of a species.

(B) They follow Mendelian inheritance.

(C) Not homologous with 'A' chromosome.

(D) Delay flowering in plants.

48. ..... means lack of pairing of homologous chromosome.

(A) Synapsis

(B) Desynapsis

(C) Asynapsis

(D) Metakinesis

49. Synaptonemal complex is discovered by :

(A) Robert Brown

(B) Muller

(C) Mendel

(D) Moses and Fawcett

50. ..... is a process by which a polyploid behaves as a diploid.

(A) Endoreduplication

(B) Replication

(C) Diploidization

(D) None of the above

51. Apomixis involves :

(A) Production of unreduced gametophyte

(B) Failure of fertilization

(C) Parthenogenetic development of unreduced gametes in whole plant

(D) All of the above

52. The sporophyte having the gametophytic chromosome number is known as :

(A) Haploid

(B) Diploid

(C) Triploid

(D) Polyploid

53. The most important use of haploid is :

(A) Production hybrid

(B) Production homozygous lines

(C) Production of synthetic variety

(D) Production of pure line

54. $2n = x = 7$ represents :

(A) Diploid

(B) Haploid

(C) Monoploid

(D) All of the above

55. Chromosome number can be doubled by :

(A) N_2O

(B) Colchicine

(C) Protoplast fusion

(D) All of the above

56. Diploidization system in wheat is due to gene :

(A) Ph-1

(B) Rht-1

(C) Tomb thumb

(D) Dee Gee Woo Gen

57. Interphase sub-stages G_1, S, G_2 classified by :

(A) Fleming

(B) Howard and Pelc

(C) Morgan

(D) Cuenot

58. The term 'trisomic' was coined by :

(A) Sturtevant

(B) C. B. Bridges

(C) Blakeslee

(D) Renner

59. Trisomics is used in :

(A) Chromosome mapping

(B) Assigning linkage group to a specific chromosome

(C) Location of a gene on specific chromosome

(D) All of the above

60. Somatic division is visible in :

(A) Stem and root tip only

(B) Leaf

(C) Flower

(D) Root tip only

(Only for Rough Work)

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the most correct/appropriate answer and mark the same in the OMR Answer-Sheet as per the direction :

Example :

Question :

Q. 1 (A) ● (C) (D)
Q. 2 (A) (B) ● (D)
Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.

6. All answers are to be given on OMR Answer sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.

7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.

8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.

9. There will be no negative marking.

10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.

11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.

12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. : On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is ny discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर— A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से एक सबसे सही अथवा सबसे उपयुक्त उत्तर छाँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)
प्रश्न 2 (A) (B) ● (D)
प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।

6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।

7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।

8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।

9. निगेटिव मार्किंग नहीं है।

10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।

11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।

12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण : प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।