Roll No. .....

Question Booklet Number

O. M. R. Serial No.

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

(First Semester) EXAMINATION, 2021-22

PRINCIPLES OF GENETICS

Paper Code				
GP	5	0	0	1

Questions Booklet Series
A

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. Mendel's results were published in the :

(A) Journal of Heredity

(B) Journal of Genetics

(C) Proceeding of Natural History Society of Brunn

(D) All of the above

2. A cross of F_1 with its homozygous recessive parent is known as :

(A) Back cross

(B) Test cross

(C) Top cross

(D) Reciprocal cross

3. The terms genotype and phenotype were coined by :

(A) Bateson (1905)

(B) Johannsen (1909)

(C) Nilson Ehle (1908)

(D) Mendel (1886)

4. The genes which have masking effect is called :

(A) Hypostatic genes

(B) Epistatic genes

(C) Recessive genes

(D) Dominant genes

5. In duplicate gene action, in F_2 the phenotypic ratio of 9 : 3 : 3 : 1 is modified to :

(A) 9 : 7

(B) 9 : 3 : 4

(C) 12 : 3 : 1

(D) 15 : 1

6. Crossing over takes place during :

(A) Leptotene

(B) Zygotene

(C) Pachytene

(D) Diplotene

7. A cross made between two inbreds by reversing the order of male and female parent is called :

(A) Back cross

(B) Test cross

(C) Top cross

(D) Reciprocal cross

8. Crossing over occurs between non-sister chromatids of :

(A) Homologous chromosomes

(B) Non-homologous chromosomes

(C) Hemilogous chromosomes

(D) All of the above

9. How many gametes will be produced by genotypes AaBbDD ?

(A) 2

(B) 4

(C) 8

(D) 6

10. Sex chromosomes are also known as :

(A) Autosomes

(B) Allosomes

(C) Ribosomes

(D) Lysosomes

11. Chromosome map is also known as :

(A) Linkage map

(B) Genetic map

(C) Both (A) and (B)

(D) None of the above

12. The genetic balance theory of sex determination was proposed by :

(A) Morgan (1910)

(B) Bateson (1906)

(C) Bridges (1921)

(D) McLung (1902)

13. Sex linked genes are located on :

(A) X-chromosomes

(B) Y-chromosomes

(C) Autosomes

(D) All of the above

14. Sex linkage was first discovered by T. H. Morgan in :

(A) *Drosophila*

(B) Maize

(C) Pea

(D) *E. coli*

15. The genes which govern cytoplasmic inheritance are called :

(A) Plasmogenes

(B) Cytoplasmic genes

(C) Extranuclear genes

(D) All of the above

16. Holandric genes are present on :

(A) X-chromosomes

(B) Y-chromosomes

(C) Autosomes

(D) All of the above

17. The first case of cytoplasmic inheritance was reported by :

(A) Correns (1909)

(B) Caspari (1936)

(C) T. H. Morgan (1910)

(D) Bridges (1921)

18. In maize, cytoplasmic male sterility is governed by :

(A) Chloroplast DNA

(B) Mitochondrial DNA

(C) Both (A) and (B)

(D) None of the above

19. The term 'gene' was coined by :

(A) Mendel (1866)

(B) Johannsen (1909)

(C) Morgan (1910)

(D) Benzer (1955)

20. The gene was subdivided into cistron, recon and muton by :

(A) Watson and Crick (1953)

(B) Green (1949)

(C) Benzer (1955)

(D) Morgan (1933)

21. Existence of more than two alleles at a locus is referred to as :

(A) Isoallele

(B) Pseudoallele

(C) Multiple allele

(D) None of the above

22. The jumping gene was discovered by :

(A) Johannsen (1909)

(B) Morgan (1933)

(C) Barbara McClintock (1950)

(D) Benzer (1955)

23. Jumping gene was first discovered in :

(A) *Drosophila*

(B) Maize

(C) Pea

(D) Oenothera

24. Alternative form of a gene is known as :

(A) DNA

(B) Allele

(C) RNA

(D) All of the above

25. DNA is a polymer of :

(A) Nucleosides

(B) Nucleotides

(C) Amino acids

(D) None of the above

26. The double helical structure of DNA was proposed by :

(A) Griffith (1928)

(B) Beadle and Tatum (1941)

(C) Watson and Crick (1953)

(D) O. T. Avery (1944)

27. DNA as the genetic material was first discovered by :

(A) Griffith (1928)

(B) O. T. Avery, MacLeod and Carty (1944)

(C) Hershey and Chase (1951)

(D) Benzer (1955)

28. In a DNA molecule thymine always pair with :

(A) Adenine

(B) Guanine

(C) Cytosine

(D) Uracil

29. RNA acts as a genetic material in :

(A) TMV

(B) *E. coli*

(C) Neurospora

(D) None of the above

30. The one gene one enzyme hypothesis was proposed by :

(A) Benzer (1955)

(B) Crick (1966)

(C) Beadle and Tatum (1941)

(D) Garrod (1902)

31. The process of synthesis of *m*RNA from a DNA template is known as :

(A) Transcription

(B) Translation

(C) Transformation

(D) Transduction

32. Reverse transcription was first reported by :

(A) Watson and Crick (1953)

(B) Crick (1966)

(C) Temin and Baltimore (1970)

(D) Benzer (1955)

33. The term 'mutation' was coined by :

(A) T. H. Morgan (1910)

(B) Hugo de Vries (1900)

(C) Muller (1927)

(D) Stadler (1928)

34. Operon model of gene regulation in *E. coli* was discovered by :

(A) Jacob and Monod (1961)

(B) Temin and Baltimore (1971)

(C) Watson and Crick (1953)

(D) Beadle and Tatum (1958)

35. A unit of mutation in a gene is known as :

(A) Cistron

(B) Recon

(C) Muton

(D) All of the above

36. Stadler, first used X-rays for induction of mutation in :

(A) *Drosophila*

(B) Maize

(C) Wheat

(D) Barley

37. Substitution of a purine by a pyrimidine or vice versa is called :

(A) Transition

(B) Transversion

(C) Translocation

(D) Translation

38. In a population, gene frequencies remain constant when there is :

(A) Inbreeding

(B) Outbreeding

(C) Random mating

(D) Selective mating

39. Random mating population is also known as :

(A) Mendelian population

(B) Panmictic population

(C) Both (A) and (B)

(D) None of the above

40. In a random mating population, gene frequencies remain constant generation after generation in the absence of :

(A) Selection

(B) Mutation

(C) Migration

(D) All of the above

41. Pyrimidine bases include :

(A) A and G

(B) A and T

(C) C and G

(D) T, C and U

42. Which RNA does act as a carrier of amino acids during protein synthesis ?

(A) *m*RNA

(B) *t*RNA

(C) *r*RNA

(D) None of the above

43. In DNA molecule, adenine and thymine bases are joined by :

(A) Single hydrogen bond

(B) Double hydrogen bond

(C) Triple hydrogen bond

(D) All of the above

44. In RNA molecule, uracil is present in place of :

(A) Adenine

(B) Guanine

(C) Thymine

(D) Cytosine

45. The foundation of population genetics was laid by :

(A) Watson and Crick

(B) Hardy and Weinberg

(C) Comstock and Robinson

(D) Beadle and Tatum

46. Substitution of one purine by another purine is called :

(A) Transition

(B) Transversion

(C) Addition

(D) Deletion

47. Inheritance of kernel colour in wheat was first reported by :

(A) Nilson Ehle (1908)

(B) Correns (1909)

(C) Morgan (1910)

(D) E. M. East (1916)

48. In meiosis, largest phase is :

(A) Prophase I

(B) Metaphase I

(C) Anaphase I

(D) Telophase I

49. Fur colour of rabbit is an example of :

(A) Multiple factor

(B) Multiple allele

(C) Multiple gene

(D) All of the above

50. A trisomic individual is represened by :

(A) $2n - 1$

(B) $2n + 1$

(C) $2n - 2$

(D) $2n + 2$

51. In mitosis, chromatids move to opposite pole during :

(A) Prophase

(B) Metaphase

(C) Anaphase

(D) Telophase

52. Sex index is represented as :

(A) X/Y

(B) X/X

(C) X/A

(D) A/X

53. In a cell, site of protein synthesis is :

(A) Mitochondria

(B) Chloroplast

(C) Ribosomes

(D) Lysosomes

54. Grana and Stroma are the parts of :

(A) Mitochondria

(B) Chloroplast

(C) Ribosomes

(D) Golgi bodies

55. Meiosis is also known as :

(A) Reductional division

(B) Homotypic division

(C) Heterotypic division

(D) All of the above

56. At anaphase, a metacentric chromosome will assume :

(A) Rod shape

(B) J-shape

(C) V-shape

(D) None of the above

57. In tertiary trisomic, an extra chromosome is :

(A) Simple chromosome

(B) Isochromosome

(C) Translocated chromosome

(D) None of the above

58. McClintock was awarded Nobel Prize in 1984 for the discovery of :

(A) Split gene

(B) Jumping gene

(C) Pseudogenes

(D) Overlapping genes

59. The process of shift of hydrogen atom from one position to another position in a purine or in a pyrimidine base is called :

(A) Transition

(B) Transversion

(C) Tautomerization

(D) All of the above

60. Triticale has been synthesized from a cross between :

(A) Wheat × Rice

(B) Wheat × Rye

(C) Wheat × Barley

(D) Wheat × Maize

(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।