

Set No. 1

18P/287/22

11310

Total No. of Printed Pages : 20

Question Booklet No.

(To be filled up by the candidate by blue/black ball-point pen)

Roll No.

Roll No. (Write the digits in words)

Serial No. of OMR Answer Sheet

Centre Code No.

Day and Date

(Signature of Invigilator)

INSTRUCTIONS TO CANDIDATES

1. Use only blue/black ball-point pen in the space above and on both sides of the Answer Sheet)
2. Within 30 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilators immediately to obtain a good Question Booklet.
3. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card*.
4. Separate OMR Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided. Only the Answer Sheet will be evaluated.
5. Write all entries by blue/black ball pen in the space provided above.
6. On the front page of the OMR Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, write the Question Booklet Number, Centre Code Number and the Set Number (wherever applicable) in appropriate places.
7. Overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR Answer Sheet and Roll No. and OMR Answer Sheet No. on the Question Booklet.
8. Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.
9. Each question in this Booklet is followed by four alternative answers. For each question, you are to select the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the OMR Answer Sheet.
10. For each question, darken only one circle on the OMR Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
11. Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero mark).
12. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
13. On completion of the Test, the candidate must handover the OMR Answer Sheet to the Invigilator in the examination room/hall. However, candidates are allowed to take away Test Booklet and copy of OMR Answer Sheet with them.
14. Candidates are not permitted to leave the Examination Hall until the end of the Test.
15. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

(उपर्यक्त निर्देश हिन्दी में अन्तिम आवरण-पृष्ठ पर दिये गये हैं।)

FOR ROUGH WORK / रफ कार्य के लिए

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No. of Questions : 120

Time : 2 Hours]

[Full Marks : 360

Note : (i) Attempt as many questions as you can. Each question carries 3 (three) marks. **One mark will be deducted for each incorrect answer. Zero** mark will be awarded for each unattempted question.

(ii) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

1. Which of the following plant viruses has double-stranded DNA genome ?
(1) Cauliflower Mosaic Virus (2) Tobacco Mosaic Virus
(3) Maize Streak Virus (4) Brome Mosaic Virus
2. Alcohol production from sugar is based on the organism :
(1) Bacteria (2) Protozoa
(3) Yeast (4) Bacteria and Protozoa
3. The insecticidal compound Azadirachtin is obtained from :
(1) Arjuna (2) Ginger (3) Turmeric (4) Neem
4. The medicinal plant Arjuna is used for management of :
(1) Diabetes (2) Peptic ulcers
(3) Cardiovascular problems (4) Wounds
5. A 'gene sanctuary' is created for the conservation of :
(1) cultivated species (2) animal species
(3) wild relatives of crops (4) cultivated and wild species

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6. The Kanha National Park is a reserve for :
(1) Millets (2) Graminaceous species
(3) Legumes (4) Tigers
7. The somatic chromosome number of a diploid plant is denoted by $2n$. The somatic chromosome number of a tetraploid plant will be depicted as :
(1) $2x$ (2) $4x$ (3) $2n$ (4) $4n$
8. An anticodon is found in :
(1) tRNA (2) mRNA (3) rRNA (4) siRNA
9. Thymine does occur in :
(1) siRNA (2) tRNA (3) mRNA (4) rRNA
10. Which of the following is *not* associated with protein synthesis ?
(1) Ribosome (2) Polysome
(3) Golgi body (4) Rough endoplasmic reticulum
11. The haploids of which of the following are fertile ?
(1) Rice (2) Tomato (3) Barley (4) Potato
12. The endosperm of a plant species has 21 chromosomes. Which of the following cells will have 14 chromosomes ?
(1) Pollen grains (2) Pollen mother cells
(3) Synergid cells (4) Megaspores
13. When a diploid individual has a single allele of a gene, this condition is known as :
(1) Hemizygous (2) Homozygous (3) Heterozygous (4) Segregation
14. Cell cultures of a plant species show root regeneration. This situation is best described by the term :
(1) Cytodifferentiation (2) Caulogenesis
(3) Totipotency (4) Rhizogenesis

(2)

15. Males of which of the following insects are always haploid ?
(1) House fly (2) Butterfly
(3) Termite (4) Lady bird beetle
16. In case of honey bee, workers are :
(1) Female
(2) Male
(3) Intersex
(4) Some are male and some are female
17. Which of the following does not affect gene function ?
(1) DNA methylation (2) Heterochromatinization
(3) Cutimization (4) Histone acetylation
18. The family name cruciferae is related to :
(1) Corolla shape (2) Fruit type (3) Inflorescence (4) Placentation
19. Basal placentation is found in the family :
(1) Cruciferae (2) Leguminosae (3) Solanaceae (4) Graminae
20. Inferior ovaries are found in :
(1) Cruciferae (2) Rosaceae (3) Solanaceae (4) Leguminosae
21. *Gossypium* spp. belong to family :
(1) Malvaceae (2) Rosaceae (3) Leguminosae (4) Solanaceae
22. Which of the following is **not** correct about *Rhizobium* spp. ?
(1) Form root nodules
(2) Form stem nodules
(3) Can fix nitrogen in free-living state
(4) Can multiply in soil in free-living state
23. Which of the following is prokaryote ?
(1) Protozoa (2) Blue-green algae
(3) Green algae (4) Chlorella

(3)

P.T.O.

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24. The 'Killer' trait of *Paramecium* is due to :
(1) a nuclear gene (2) a plasma gene
(3) both nuclear and plasma genes (4) an endosymbiont
25. Companion cells are found in :
(1) cortex (2) phloem (3) pericycle (4) xylem
26. Which of the following is devoid of nucleic acids ?
(1) T₂ phage (2) Prions
(3) Tobacco mosaic virus (4) Cauliflower mosaic virus
27. Satellite RNA is found in some :
(1) RNA viruses (2) DNA viruses (3) Bacteria (4) Yeast
28. *Agaricus bisporus* is generally known as :
(1) Dhingri mushroom (2) Paddy mushroom
(3) Chinese mushroom (4) Button mushroom
29. In some individuals, consumption of milk leads to diarrhoea; this is due to :
(1) casein (2) microbes (3) lactose (4) adulteration
30. Cereal proteins are deficient in :
(1) Lysine (2) Methionine (3) Proline (4) Valine
31. The invariable feature of RNA molecules is :
(1) Uracil (2) Single strand (3) Double helix (4) D-ribose
32. Backcross method is used to achieve which of the following objectives ?
Objectives :
I. Gene transfer
II. Cytoplasm transfer
III. Gene pyramiding
IV. Transgressive Segregation
(1) I, II, III, IV (2) I, II, III (3) I, II, IV (4) II, III, IV

(4)

33. The haploid production technique applicable to the largest number of species is :
- (1) anther culture (2) ovary culture
(3) pollination with inducer strain (4) interspecific hybridization
34. Which of the following is a variety comprising more than one homozygous genotype ?
- (1) clone (2) pureline (3) synthetic (4) multiline
35. Which of the following lines consists of a single heterozygous genotype ?
- Lines :**
- I. Clone
II. Pureline
III. Single Cross
IV. Double Cross
- (1) II, III, IV (2) I, II, III, IV (3) I, III (4) I, III, IV
36. Which of the following is *not* seed ?
- (1) Potato tubers used for planting
(2) Wheat grains used as food
(3) Gram seed used for sowing
(4) Wheat grains used for sowing
37. Mass selection is used for production of :
- (1) Certified seed (2) Foundation seed
(3) Nucleus seed (4) Truthful seed
38. In angiosperms like tobacco, plasma genes show which of the following modes of transmission ?
- (1) Strictly maternal only
(2) Generally maternal, but some paternal
(3) Only Paternal
(4) Biparental

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39. With reference to organogenesis, the most important component of plant tissue culture system is :

- (1) Vitamins (2) Carbon and energy source
(3) Micronutrients (4) Growth regulator

40. Which of the following is *not* an insect predator ?

- (1) Ladybird beetles (2) Cecidomyiids
(3) Praying Mantis (4) Mealy bugs

41. Which of the following insects transmit viruses ?

Insects :

- I. Leaf hoppers
II. Aphids
III. Whiteflies

- (1) I, II, III (2) I, II (3) I, III (4) II, III

42. The major stored grain insect pests belong to the orders :

Orders :

- I. Coleoptera
II. Diptera
III. Lepidoptera

- (1) I, II, III (2) I, III (3) I, II (4) II, III

43. Cotton is attacked by the insect pests :

Insect pests

- I. Spotted bollworm
II. Jassids
III. White fly
IV. Aphids

- (1) I, II, III, IV (2) I, III, IV (3) I, II, III (4) II, III, IV

44. *Pythium* causes :

- (1) root rot (2) leaf spot (3) leaf blight (4) fruit rot

(6)

45. Which of the following belongs to fungi imperfecti ?
 (1) *Erysiphe pisi* (2) *Phytophthora infestans*
 (3) *Aspergillus niger* (4) *Sclerospora graminicola*
46. Late blight of potato is caused by :
 (1) *Aternaria solani* (2) *Phytophthora infestans*
 (3) *Rhizoctonia solani* (4) *Pripolaris Cylinderica*
47. *Sclerospora graminicola* causes downy mildew of :
 (1) sorghum (2) cucurbits (3) wheat (4) pearl millet
48. Downy mildew is caused by members of :
 (1) Ascomycetes (2) Oomycetes
 (3) Basidiomycetes (4) Deuteromycetes
49. In case of which of the following gene interactions a 3 : 1 phenotypic ratio would be obtained in test cross ?
Gene Interaction :
 I. Duplicate
 II. Complementary
 III. Supplementary
 (1) I, II (2) II, III (3) I, III (4) I, II, III
50. The primary function of a gene is to encode :
 (1) a polypeptide (2) a protein
 (3) a RNA molecule (4) an enzyme
51. The F₂ phenotypic ratio in case of masking gene action is :
 (1) 9 : 3 : 4 (2) 12 : 3 : 1 (3) 13 : 3 (4) 9 : 6 : 1
52. Polygenes show :
 (1) additive gene effects
 (2) dominance gene effects
 (3) additive and interaction effects
 (4) additive, dominance and interaction effects

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53. A E_1 hybrid will be of commercial value if its performance is superior to the :
(1) mid-parent (2) superior parent
(3) best check variety (4) either parent
54. Genetic variation will be present in :
(1) E_1 from a cross between two purelines
(2) A double haploid line
(3) E_1 from a cross between a pureline and a doubled haploid line
(4) E_1 from two clones
55. Crossing over occurs during :
(1) Pachytene (2) Zygotene (3) Diakinesis (4) Diplotene
56. Which of the following is dioecious ?
(1) Maize (2) Castor (3) Triticale (4) Papaya
57. Protandry occurs in :
(1) Pearlmillet (2) Maize (3) Tomato (4) *Brassica* spp.
58. Which of the following is a recent introduction in India ?
(1) Tobacco (2) Potato (3) Soyabean (4) Tomato
59. In case of garlic, bulbils develop from :
(1) Leaves (2) Roots (3) Shoots (4) Flowers
60. The onion we eat is a modified stem called :
(1) bulb (2) tuber (3) rhizome (4) corm
61. Xenia represents the effect of pollen genotype on :
(1) fruit (2) embryo (3) endosperm (4) ovary
62. Which of the following is a threshold character ?
(1) Seed colour (2) Disease resistance
(3) Seed coat colour (4) Flower colour

(8)

63. Which of the following is an integral component of proteins, but not of DNA ?
 (1) Phosphorus (2) Carbon (3) Nitrogen (4) Sulphur
64. Which of the following is *not* a micronutrient ?
 (1) Mn (2) Fe (3) Mg (4) Zn
65. Which of the following is considered as the '*Drosophila* of plant kingdom' ?
 (1) *Arabidopsis* (2) *Pisum* (3) *Triticum* (4) *Nicotiana*
66. Photophosphorylation occurs in :
 (1) Peroxisomes (2) Mitochondria
 (3) Golgi bodies (4) Chloroplasts
67. Which of the following histones is the easiest to be separated from chromatin ?
 (1) H3 (2) H2b (3) H1 (4) H4
68. Pseudodominance is produced by :
 (1) duplication (2) inversion (3) translocation (4) deletion
69. Genes that affect the expression of more than one character are called :
 (1) epistative (2) polymeric
 (3) pleiotropic (4) super genes
70. In case of *Drosophila*, the progeny from a white eye female mated to a red eye male will be :
 (1) 1 red eye female : 1 white eye male
 (2) All red eye flies
 (3) All white eye flies
 (4) 3 Red eye flies : 1 white eye flies
71. Dominance relationship between alleles is modified by the sex of the individuals in the case of :
 (1) sex-linked traits (2) sex-limited traits
 (3) sex-influenced traits (4) primary sex characters

79. According to the current view, heterosis is the result of :
- (1) Overdominance
 - (2) Mainly dominance plus overdominance
 - (3) Dominance
 - (4) Epistasis
80. Isozymes represent variation in :
- (1) heat stability
 - (2) substrate specificity
 - (3) pH optima
 - (4) electrophoretic mobility
81. The strongest effects on protein function are caused by mutations due to :
- (1) base substitution
 - (2) frame-shift
 - (3) transition
 - (4) transversion
82. In a salivary gland cell of *Drosophila*, the number of giant-chromosomes will be :
- (1) $4n$
 - (2) $3n$
 - (3) n
 - (4) $2n$
83. Which of the following is the most gentle method of drying ?
- (1) Freeze drying
 - (2) Spray drying
 - (3) Vacuum drying
 - (4) Sun drying
84. Ribosomes are produced in :
- (1) Endoplasmic reticulum
 - (2) Golgi bodies
 - (3) Nucleolus
 - (4) Cytosol
85. Which of the following aberrations can alter the morphology of a chromosome without changing its gene content ?
- (1) Inversion
 - (2) Deletion
 - (3) Duplication
 - (4) Translocation
86. In an acrocentric chromosome, the centromere is located :
- (1) in the middle of the chromosome
 - (2) at one end of the chromosome
 - (3) between one end and the middle of the chromosome
 - (4) very close to one end of the chromosome

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87. Each chromosome comprises two chromatids during :
- (1) G1 phase (2) G2 phase
(3) S phase (4) Telophase
88. Fruit development without pollination is known as :
- (1) parthenocarpy (2) pathenogenesis
(3) apomixis (4) apogamy
89. The maximum use of heterosis is done by :
- (1) synthetic varieties (2) double cross hybrids
(3) composite varieties (4) single cross hybrids
90. Selfing in which of the following will produce genetic variation ?
- (1) Pureline (2) Clone
(3) Inbred line (4) Inbred line and clone
91. Endosperm is present in the seeds of :
- (1) Pea (2) Groundnut (3) Mustard (4) Pigeon pea
92. Which of the following crops is often cross-pollinated ?
- (1) Pigeon pea (2) Pea (3) Wheat (4) Maize
93. Sister chromatids separate during which of the following stages ?
- Stage :
- I. Mitotic anaphase
II. Anaphase I
III. Anaphase II
- (1) I, II (2) II, III
(3) I, III (4) I, II, III

(12)

106. Which of the following is *not* related to transgene ?
- (1) transferred by recombinant DNA technology
 - (2) synthesized chemically
 - (3) from another organism
 - (4) from a related species
107. The somatic chromosome complement of a plant is $2n - 1 - 1$. This plant is known as :
- (1) monosomic
 - (2) double trisomic
 - (3) double monosomic
 - (4) nullisomic
108. By definition, self-pollination is essential for propagation of :
- (1) clones
 - (2) purelines
 - (3) inbreds
 - (4) synthetics
109. A ring of four chromosomes will be seen at MI of :
- (1) inversion heterozygote
 - (2) inversion homozygote
 - (3) translocation heterozygote
 - (4) translocation homozygote
110. A single chromosome break can produce :
- (1) inversion
 - (2) duplication
 - (3) translocation
 - (4) deletion
111. Apomixis is most prevalent in :
- (1) Graminae
 - (2) Cruciferae
 - (3) Solanaceae
 - (4) Leguminosae
112. In *Drosophila*, maleness is determined by :
- (1) Y chromosome
 - (2) X chromosomes
 - (3) autosome
 - (4) autosomes and X chromosomes
113. Which is the most widely used method for creation of genetic variation ?
- (1) Interspecific hybridization
 - (2) Intervarietal hybridization
 - (3) Genetic transformation
 - (4) Mutagenesis

114. Which of the following factors affects disease development ?
Factors :
I. Host plant genotype
II. Environment
III. Pathogen genotype
(1) I, II, III (2) I, II (3) I, III (4) II, III
115. Emasculation is easiest in :
(1) pea (2) maize (3) pigeonpea (4) barley
116. 'Chemical hybridizing agents' :
(1) promote cross-pollination (2) promote femaleness
(3) promote pollen germination (4) induce male sterility
117. The notation 'species A + species B' represents :
(1) a species hybrid (2) a sexual hybrid
(3) an allopolyploid (4) a somatic hybrid
118. Sporophytic self-incompatibility is found in :
(1) Solanum (2) Tomato
(3) Brassica (4) Papaver
119. Bt-brinjal has been approved for cultivation in :
(1) Bangladesh (2) India (3) Nepal (4) Pakistan
120. Which of the following disciplines aims to modify crop genotypes ?
Disciplines :
I. Plant breeding
II. Plant physiology
III. Plant biotechnology
(1) I, II (2) I, III
(3) II, III (4) I, II, III

FOR ROUGH WORK / रफ कार्य के लिए

अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण-पृष्ठ पर तथा ओ०एम०आर० उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली/काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न-पुस्तिका मिलने के 30 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न पूरा नहीं है। पुस्तिका दावपुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।
2. परीक्षा भवन में प्रवेश-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।
3. OMR उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरी OMR उत्तर-पत्र नहीं दिया जायेगा। केवल OMR उत्तर-पत्र का ही मूल्यांकन किया जायेगा।
4. उपर दिये गये सभी स्थानों की प्रविष्टियों को काल / नीले बाल-प्वाइंट पेन से लिखें।
5. OMR उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।
6. ओ० एम० आर० उत्तर-पत्र पर अनुक्रमांक संख्या, प्रश्न-पुस्तिका संख्या व सेट संख्या (यदि उपलब्ध हो) प्रश्न-पुस्तिका पर अनुक्रमांक संख्या और ओ० एम० आर० उत्तर-पत्र संख्या की प्रविष्टियां न भरने पर परीक्षा की अनुमति नहीं है।
7. अनुकूल प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिए अन्यथा परीक्षा केंद्र पर प्रवेश का प्रयास माना जायेगा।
8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तरों में से सही उत्तर को OMR उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रश्न पत्र पर दिये गये निर्देशों के अनुसार बाल-प्वाइंट पेन से गाढ़ा करना है।
9. प्रत्येक प्रश्न के उत्तर के लिये केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने से प्रश्न एक वृत्त को अपूर्ण करने पर वह उत्तर गलत माना जायेगा।
10. उत्तर दें कि एक बार सही द्वारा उचित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो सम्बन्धित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। एक वृत्त पर उत्तर देना उचित नहीं माना जायेगा।
11. एक वृत्त को लिये इस पुस्तिका के नुराफुल के अंदर वाला पृष्ठ तथा अंतिम आवरण पर उचित प्रविष्टि भरें।
12. परीक्षा के उपरान्त अभ्यर्थी ओ० एम० आर० उत्तर-पत्रक परीक्षा कक्ष/भवन में निरीक्षक को अवश्य सौंप दें। जबकि अभ्यर्थियों को प्रश्न-पुस्तिका और ओ० एम० आर० उत्तर-पत्रक की कापी अपने साथ ले जाने की अनुमति है।
13. अभ्यर्थी को परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।
14. यदि कोई अभ्यर्थी परीक्षा में अनुपेक्षित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित कक्षा/की भागी होगा/होगी।