

Roll No. ....

Question Booklet Number

O. M. R. Serial No.

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**M. Sc. (Ag.) Agricultural Entomology**  
**(Third Semester) EXAMINATION, 2021-22**  
**INSECT VECTORS OF PLANT VIRUSES AND**  
**OTHER PAITHOGENS**

**Paper Code**

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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. NSKE is used as a/an .....  
against insect.  
(A) Attractant  
(B) Repellant  
(C) Deterrent  
(D) Arrestant
2. Monocrotophos is ..... in action.  
(A) Only systemic  
(B) Only contact  
(C) Both systemic and contact  
(D) Fumigant
3. Phytoplasmas are ..... to plants.  
(A) Harmful  
(B) Beneficial  
(C) Neutral  
(D) All of the above
4. The nymphs and adults of leaf hoppers  
possess ..... mouthparts.  
(A) Different type  
(B) Similar type  
(C) Both (A) and (B)  
(D) None of the above
5. The incubation period is :  
(A) Temperature neutral  
(B) Temperature independent  
(C) Temperature dependent  
(D) None of the above
6. The prepupal and pupal stages of thrips  
are passed in :  
(A) Plant  
(B) Leaves  
(C) Soil  
(D) All of the above
7. The leaf hoppers are more attracted to :  
(A) Red colour  
(B) Blue colour  
(C) White colour  
(D) Yellow colour
8. Membracids are ..... in transmitting  
of viruses compared with leaf hoppers.  
(A) more efficient  
(B) less efficient  
(C) not efficient  
(D) None of the above

9. *Pentalonia nigronervosa* is a/an :
- (A) Grasshopper
  - (B) Beetle
  - (C) Aphid
  - (D) Butterfly
10. *Nilaparvata lugens* belongs to family :
- (A) Delphacidae
  - (B) Cicadellidae
  - (C) Pentatomidae
  - (D) None of the above
11. The tomato leaf curl virus is transmitted by :
- (A) Beetle
  - (B) Aphid
  - (C) Butterfly
  - (D) White fly
12. *Toxoptera citricida* is a/an :
- (A) Mite
  - (B) Nematode
  - (C) Aphid
  - (D) White fly
13. Scale insects belong to :
- (A) Hymenoptera
  - (B) Lepidoptera
  - (C) Hemiptera
  - (D) Coleoptera
14. *Leptinotarsa decimlineata* is a :
- (A) Wasp
  - (B) Beetle
  - (C) Weevil
  - (D) Butterfly
15. Cicadellids are :
- (A) Leaf hoppers
  - (B) Plant hoppers
  - (C) Frog hoppers
  - (D) Grass hoppers
16. Thrips possess ..... type of mouth parts.
- (A) Chewing and Lapping
  - (B) Rasping and Sucking
  - (C) Piercing and Sucking
  - (D) Sponging

17. *Nephotettix apicalis* belongs to family :
- (A) Diaspidae
  - (B) Plutellidae
  - (C) Delphacidae
  - (D) Cicadellidae
18. Generally the population of *Nilaparvata lugens* is found at the ..... of paddy plants.
- (A) Upper part
  - (B) Middle part
  - (C) Basal part
  - (D) None of the above
19. The pigeonpea sterility mosaic virus is associated with a mite, namely :
- (A) *Pediculopsis graminum*
  - (B) *Acarica cajani*
  - (C) *Eriophyes ribis*
  - (D) None of the above
20. Viruses are consisted of ..... having high molecular weight.
- (A) Carbohydrates
  - (B) Proteins
  - (C) Fats
  - (D) All of the above
21. Respiration of plant generally ..... immediately after infection by virus.
- (A) Increases
  - (B) Decreases
  - (C) Not affected
  - (D) All of the above
22. Viruses cause a ..... in photosynthesis and growth regulating substances.
- (A) Decrease
  - (B) Increase
  - (C) No effect
  - (D) All of the above
23. Order Homoptera contains ..... number and most important insect vectors of plant viruses.
- (A) lowest
  - (B) largest
  - (C) Both (A) and (B)
  - (D) None of the above

24. The first record of tobacco mosaic virus was identified by :
- (A) Adolf Mayer, 1886
  - (B) Waite, 1891
  - (C) Leach, 1926
  - (D) None of the above
25. Which of the following groups of viruses generally attack plants ?
- (A) Retroviruses
  - (B) Riboviruses
  - (C) Rheoviruses
  - (D) Enteroviruses
26. Which of the following is not a method by which viral infection spreads in plants ?
- (A) Exuding sap of infected plants
  - (B) Infected seeds
  - (C) Through meristem
  - (D) Infected pollen
27. Which of the following is not a common measure of controlling viral infections ?
- (A) Using healthy virus free seeds
  - (B) Antibiotics
  - (C) Using resistant varieties
  - (D) Protection from insect vectors
28. Which of the following organisms causes bean mosaic disease in plants ?
- (A) Virus
  - (B) Bacteria
  - (C) Fungi
  - (D) Nematode
29. Leaf curl in chilli is transmitted by :
- (A) *Bemisia tabaci*
  - (B) *Scirtothrips dorsalis*
  - (C) *Myzus persicae*
  - (D) None of the above
30. Vein banding of mosaic of potato is transmitted by :
- (A) *Aphis gossypii*
  - (B) *Acarica cajani*
  - (C) *Myzus persicae*
  - (D) None of the above

31. All the leaf hopper transmitted viruses are :
- (A) Circulatory
  - (B) Hexagonal
  - (C) Triangular
  - (D) Square
32. The best way to control a virus disease is to keep it out of an area through system of :
- (A) Integrated pest management
  - (B) Vector free
  - (C) Chemical control
  - (D) Quarantine inspection and certification
33. Major symptoms of dwarf disease of rice as tungro :
- (A) Curling of leaves
  - (B) Redness of leaves
  - (C) Whiteness of leaves
  - (D) Yellowing of leaves
34. The minimum time that a vector needs to inoculate the virus on virus free plants is known as :
- (A) Latent period
  - (B) Inoculation threshold period
  - (C) Both (A) and (B)
  - (D) None of the above
35. The minimum time that a vector needs to acquire virus from diseased source is known as :
- (A) Acquisition feeding period
  - (B) Transmission threshold period
  - (C) Acquisition threshold period
  - (D) None of the above
36. The period from acquisition of virus by the vector till the time when the vectors become capable of infecting healthy plants with the virus is known as :
- (A) Latent period
  - (B) Transmission threshold period
  - (C) Both (A) and (B)
  - (D) None of the above

37. Yellow dwarf of onion virus disease is transmitted by :
- (A) Grasshopper
  - (B) Beetle
  - (C) Aphids
  - (D) None of the above
38. Streak of corn virus disease first described by :
- (A) Fuller, 1901
  - (B) Kunkel, 1937
  - (C) Jones and Riker, 1931
  - (D) None of the above
39. Potato yellow dwarf (*Solanum virus 16*) was first recognised in the year :
- (A) 1917
  - (B) 2017
  - (C) 1817
  - (D) None of the above
40. Which of the following is not a method by which a virus enters a healthy host ?
- (A) By vectors
  - (B) By meristem
  - (C) Infected fungal spores
  - (D) Through wounds
41. Which of the following is not a symptom of bean mosaic disease ?
- (A) Plants are bunchy
  - (B) Leaves show mottling
  - (C) Mosaic appearance on leaves
  - (D) Blackening of leaflet
42. Which of the following is not a method of overcoming the infection of bean mosaic disease ?
- (A) Virus free seeds
  - (B) Cutting leaves
  - (C) Delayed planting
  - (D) Sowing resistant varieties
43. Which of the following is not a bacterial plant pathogen ?
- (A) *Pseudomonas*
  - (B) *Clostridium*
  - (C) *Puccinia*
  - (D) *Xanthomonas*
44. Which of the following is not a symptom of bacterial disease in plants ?
- (A) Blight
  - (B) Mosaic
  - (C) Wilts
  - (D) Rots



45. Infectious RNA particles without the protein coat are called :
- (A) Prion
  - (B) Virion
  - (C) Viroid
  - (D) Virusoid
46. The shape of the TMV is :
- (A) Rod shaped
  - (B) Oval shaped
  - (C) Cuboidal shaped
  - (D) Spherical shaped
47. Which of the following statements are true about the TMV ?
- (A) RNA virus
  - (B) DNA virus
  - (C) Bacteriophage
  - (D) ssDNA or dsDNA
48. The viral genome is enveloped in a protein coat known as :
- (A) Capsid
  - (B) Outer envelop
  - (C) Capsomere
  - (D) Nucleic
49. The genetic constituent of viruses is :
- (A) RNA
  - (B) DNA
  - (C) ssDNA
  - (D) DNA or RNA
50. A fully formed infectious viral particle is called :
- (A) Virion
  - (B) Viriod
  - (C) Capsid
  - (D) Virusoid
51. Which of the following statement is true about the viruses ?
- (A) Free living
  - (B) Obligate parasite
  - (C) Both (A) and (B)
  - (D) None of the above
52. Which of the following is a helical virus ?
- (A) TMV
  - (B) T<sub>4</sub> phage
  - (C) Pox virus
  - (D) Herpes virus

53. The viral envelope is made up of :
- (A) Proteins
  - (B) Glycoproteins
  - (C) Lipids and proteins
  - (D) All of the above
54. Which of the following is the genome of the virus ?
- (A) DNA
  - (B) RNA
  - (C) DNA or RNA
  - (D) DNA and RNA
55. A virus is made up of :
- (A) Protein coat and nucleic acid
  - (B) Protein coat and mitochondria
  - (C) Nucleic acid and cell membrane
  - (D) Nucleic acid, cell wall and cell membrane
56. The book 'Insect Transmission of Plant Diseases' is written by :
- (A) Julian Gilbert Leach
  - (B) M. W. Allen
  - (C) J. Hutchinson
  - (D) None of the above
57. Strawberry Witch-Broom's disease is transmitted by :
- (A) *Macrosiphum pisi*
  - (B) *Pentalonia nigronervosa*
  - (C) *Aleyrodes citri*
  - (D) None of the above
58. Yellow dwarf of onion disease is transmitted by :
- (A) *Myzus persicae*
  - (B) *Bemisia tabaci*
  - (C) *Phyllophaga* sp.
  - (D) *Bemisia gossypiperda*
59. Overgrowth caused by increase in number of cells is called as :
- (A) Hypertrophy
  - (B) Hyperplasia
  - (C) Heterothallism
  - (D) None of the above
60. Tomato spotted wilt virus disease is transmitted by :
- (A) Thrips
  - (B) Mites
  - (C) Bugs
  - (D) None of the above

***(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) ☒ (B) (C) (D)

Q. 2 (A) (B) ☒ (C) (D)

Q. 3 (A) ☒ (B) (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 any 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 छोटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ☒ (B) (C) (D)

प्रश्न 2 (A) (B) ☒ (C) (D)

प्रश्न 3 (A) ☒ (B) (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।