

Roll No.

Question Booklet Number

O. M. R. Serial No.

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M. Sc. (Second Semester)
(NEP) EXAMINATION, 2025-26
ZOOLOGY
(Apiculture) (Elective)

Paper Code							
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Questions Booklet Series
C

Time : 1:30 Hours]

[Maximum Marks : 75

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. 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 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। 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. Altruistic behavior in honey bees is explained by :
 - (A) Kin selection
 - (B) Mutation theory
 - (C) Natural selection
 - (D) Artificial selection
2. In a colony of honey bees, the three primary castes are :
 - (A) Queen, King, Worker
 - (B) Queen, Worker, Drone
 - (C) Worker, Drone, Soldier
 - (D) Queen, Soldier, Drone.
3. Overcrowding of colonies in one area may lead to :
 - (A) Enhanced brood growth
 - (B) Reduced swarming
 - (C) Increased honey production
 - (D) Competition for nectar
4. In India, what time of year is best for starting new honeybee colonies ?
 - (A) Peak summer
 - (B) Monsoon peak
 - (C) Post monsoon and early winter (before honey flow)
 - (D) Mid-winter
5. IPM, or integrated pest management, lowers the danger of pesticides to bees by :
 - (A) Increasing pesticide concentration
 - (B) Eliminating pollinators
 - (C) Using selective and need-based pesticide application
 - (D) Spraying during flowering
6. Exposure to sublethal pesticides can change waggle dance by :
 - (A) Increasing communication precision
 - (B) Causing disorientation
 - (C) Enhancing recruitment
 - (D) Increasing queen pheromone production
7. In order to begin apiculture on a commercial scale, colony strength should have :
 - (A) Only queen bee
 - (B) 1-2 brood frames
 - (C) Healthy queen, drone, worker population with adequate brood
 - (D) Only drones
8. Which pesticide class is most frequently linked to Colony Collapse Disorder (CCD) ?
 - (A) Organochlorines
 - (B) Carbamates
 - (C) Neonicotinoids
 - (D) Pyrethroids

9. The economic value of honey bees in agriculture is mostly attributed to :
- (A) Honey export
 - (B) Beeswax industry
 - (C) Pollination services
 - (D) Royal jelly
10. The primary causes of the increase in mustard oil content brought on by honey bee pollination are :
- (A) Increased vegetative growth
 - (B) Enhanced fertilization and seed development
 - (C) Soil nutrient enrichment
 - (D) Hormonal spray
11. Which crop relies heavily on pollination by honey bees ?
- (A) Wheat
 - (B) Rice
 - (C) Almond
 - (D) Maize
12. A decline in the honey bee population may result in :
- (A) Increased crop yield
 - (B) Reduced fruit set
 - (C) Increased self-pollination
 - (D) Higher oil content
13. Which of the following parameters is not directly affected by honey bees pollination ?
- (A) Seed weight
 - (B) Fruit uniformity
 - (C) Protein content
 - (D) Soil pH
14. In apple orchards, honey bee pollination improves :
- (A) Only leaf number
 - (B) Root biomass
 - (C) Plant longevity
 - (D) Fruit size and shape
15. Which crop's production significantly increases as a result of pollination by honey bees ?
- (A) Wheat
 - (B) Rice
 - (C) Mustard
 - (D) Sugarcane
16. The main ways that honey bee pollination increases agricultural output are :
- (A) Increasing vegetative growth
 - (B) Enhancing cross-pollination efficiency
 - (C) Increasing soil fertility
 - (D) Reducing transpiration

17. The location of the apiary site should be :
- (A) In deep shade with no sunlight
 - (B) In waterlogged area
 - (C) In a well-drained area protected from strong winds
 - (D) On steep rocky slopes
18. The division of labor is reversed, with older bees taking on nursing duties, during :
- (A) Swarming
 - (B) Food scarcity
 - (C) Colony stress or worker shortage
 - (D) Winter only
19. In honey bee drones are formed from :
- (A) Unfertilized eggs
 - (B) Larvae fed on royal jelly
 - (C) Fasting larvae
 - (D) Fertilized eggs
20. Which of the following statement is true regarding a colony of honey bee ?
- (A) One queen and few drones
 - (B) One queen, 300-500 drones and 20000-80000 workers
 - (C) No queen, 10-20 drones and 80000 workers
 - (D) None of the above
21. The division of labor between castes in honey bees is an illustration of :
- (A) Morphological polymorphism
 - (B) Behavioral polymorphism
 - (C) Genetic polymorphism
 - (D) Environmental polymorphism
22. Which of the following statement is true regarding Guard bees ?
- (A) Newly emerged workers
 - (B) Older workers
 - (C) Middle-aged workers
 - (D) Drones
23. In honey bees, division of labor is mainly determined by :
- (A) Size polymorphism
 - (B) Sex differentiation
 - (C) Age polytheism
 - (D) Seasonal variation
24. Apiculture is limited by excessive monoculture cropping because :
- (A) Increased pollen availability
 - (B) Reduced pesticide exposure
 - (C) Continuous nectar flow throughout the year
 - (D) Reduced floral diversity and nutritional imbalance
25. Wax moths restrict apiculture by :
- (A) Feeding on nectar
 - (B) Destroying comb structures
 - (C) Killing queens directly
 - (D) Consuming pollen loads

26. Colony Collapse Disorder (CCD) is regarded as a constraint due to :
- (A) Increases drone production
 - (B) Causes sudden loss of worker bees
 - (C) Improves pollination efficiency
 - (D) Reduces swarming
27. In apiculture, one significant marketing barrier is :
- (A) Uniform pricing policy
 - (B) Adulteration and lack of quality control
 - (C) Excess processing facilities
 - (D) Government monopoly
28. When creating a flower calendar for a particular area, which of the following is necessary ?
- (A) National flowering data
 - (B) Local field survey of flora
 - (C) International honey prices
 - (D) Bee species colour
29. According to BIS honey standards, ash content mainly reflects :
- (A) Sugar level
 - (B) Moisture level
 - (C) Mineral content
 - (D) Enzyme activity
30. Some standardized hives have wire mesh installed at the bottom that aids in :
- (A) Honey filtration
 - (B) Queen rearing
 - (C) Ventilation and Varroa control
 - (D) Pollen collection
31. What is the main purpose of honey filtration after extraction ?
- (A) Sugar
 - (B) Enzymes
 - (C) Wax particles and debris
 - (D) Moisture
32. Which of the following is the most sensitive stage of bee activity to pesticide exposure during honey flow period ?
- (A) Egg stage
 - (B) Larval stage
 - (C) Foraging stage
 - (D) Pupal stage
33. In BIS standard hives, the recommended amount of bee space is around :
- (A) 3-4 mm
 - (B) 6-9 mm
 - (C) 12-15 mm
 - (D) 15-18 mm

34. A excellent plant for bee flora should mainly offer :-
- (A) Only nectar
 - (B) Only pollen
 - (C) Nectar and/or pollen in sufficient quantity
 - (D) Shade to colonies
35. What is the main purposes of a floral calendar in apiculture ?
- (A) Record honey production
 - (B) Identify flowering periods of bee flora
 - (C) Monitor bee diseases
 - (D) Measure hive temperature
36. In Indian apiculture, a significant genetic constraint is :
- (A) Excess hybrid vigor
 - (B) Lack of selective breeding programs
 - (C) High mutation rate
 - (D) Low brood rearing capacity
37. Migration of bee colonies is often limited due to :
- (A) Excess queen production
 - (B) Lack of transport facilities and floral mapping
 - (C) Overproduction of honey
 - (D) Excess drone population
38. Which of the following is primary function of a bee smoker during hive inspection ?
- (A) Kill pests
 - (B) Increase hive temperature
 - (C) Calm bees by masking alarm pheromones
 - (D) Attract queen
39. The main purposes of the queen excluder is :
- (A) Prevent drone escape
 - (B) Separate brood chamber and super
 - (C) Increase ventilation
 - (D) Reduce swarming
40. What metric is used to assess overheated and honey freshness ?
- (A) pH
 - (B) Electrical conductivity
 - (C) Hydroxymethylfurfural (HMF)
 - (D) Ash content
41. Which of the following factor is responsible for preservative nature of honey ?
- (A) High water activity
 - (B) Low osmotic pressure
 - (C) High osmotic pressure-
 - (D) High pH

42. Honey is used in cosmetic products because it :
- (A) Acts as a moisturizer
 - (B) Removes natural oils
 - (C) Dries the skin
 - (D) Causes irritation
43. Which of the following factor is responsible for antibacterial qualities of honey ?
- (A) High protein content
 - (B) Hydrogen peroxide formation
 - (C) High fat content
 - (D) Chlorophyll
44. The centrifugal honey extractor was invented by :
- (A) Franz von Hruschka
 - (B) Langstroth
 - (C) Dzierzon
 - (D) Butlerov
45. What kind of mouthparts do honey bees have ?
- (A) Chewing and lapping
 - (B) Sponging
 - (C) Biting and chewing
 - (D) Piercing and sucking
46. The honey bees' breathing apertures are known as :
- (A) Spiracles
 - (B) Tracheoles
 - (C) Stomata
 - (D) Alveoli
47. In honey bees, Johnston's organ is found in which part of body ?
- (A) Leg
 - (B) Wing
 - (C) Antenna
 - (D) Abdomen
48. The ovipositor of worker bees is modified into :
- (A) Wax gland
 - (B) Sting
 - (C) Pollen basket
 - (D) Crop
49. The crop, or honey stomach, is a component of :-
- (A) Foregut
 - (B) Midgut
 - (C) Hindgut
 - (D) Rectum
50. The "Father of Modern Beekeeping" is :
- (A) Jan Dzierzon
 - (B) L.L. Langstroth
 - (C) Karl von Frisch
 - (D) E.F. Phillips

51. Karl von Frisch was awarded the Nobel Prize for his contributions to :
- (A) Honey chemistry
 - (B) Bee genetics
 - (C) Bee communication (dance language)
 - (D) Hive construction
52. The wax moth that damages honey comb is :
- (A) *Galleria mellonella*
 - (B) *Varroa destructor*
 - (C) *Acarapis woodi*
 - (D) *Nosema apis*
53. The Central Bee Research and Training Institute (CBRTI) is established during :
- (A) 1962
 - (B) 1999
 - (C) 2001
 - (D) 1956
54. The Central Bee Research and Training Institute (CBRTI) is located in :
- (A) Lucknow
 - (B) Pune
 - (C) Sagar
 - (D) Shimla
55. Which bee product has the highest protein content ?
- (A) Honey
 - (B) Bee pollen
 - (C) Bee wax
 - (D) Propolis
56. Bee venom's active component is :
- (A) Apitoxin
 - (B) Melittin
 - (C) Royalactin
 - (D) Diastase
57. The major fatty acid unique to royal jelly is :
- (A) Palmitic acid
 - (B) Stearic acid
 - (C) 10-HDA (10-hydroxy-2-decenoic acid)
 - (D) Oleic acid
58. A high-quality honey's typical moisture content should be within the range of :
- (A) 5-8%
 - (B) 10-12%
 - (C) 14-18%
 - (D) 25-30%
59. Propolis is also known as :-
- (A) Bee glue
 - (B) Bee milk
 - (C) Bee bread
 - (D) Bee venom
60. Which bird is commonly known as the "Bee eater" ?
- (A) Kingfisher
 - (B) Crow
 - (C) Merops
 - (D) Sparrow

61. Which of the following cast of honey bee secretes Royal jelly ?
- (A) Queen bee
 - (B) Worker bee (nurse bee)
 - (C) Drone
 - (D) Wax glands
62. Honey crystallization depends mainly on the ratio of :
- (A) Sucrose to water
 - (B) Glucose to fructose
 - (C) Enzymes to minerals
 - (D) Pollen to nectar
63. Which of the following instrument is used to measure moisture content in honey ?
- (A) Hygrometer
 - (B) Refractometer
 - (C) Barometer
 - (D) Hydrometer
64. Heating honey above 60°C may lead to :
- (A) Increase in enzymes
 - (B) Decrease in HMF
 - (C) Loss of enzymes and quality
 - (D) Increase in moisture
65. The device that extracts honey without causing harm to combs is known as :
- (A) Smoker
 - (B) Separator
 - (C) Honey Extractor
 - (D) Clarifier
66. Honeycomb uncapping is accomplished with :
- (A) Hive tool
 - (B) Smoker
 - (C) Uncapping knife-
 - (D) Bee brush
67. It is best to extract honey when the moisture content is roughly :
- (A) 30-35%
 - (B) 90-92%
 - (C) 16-18%
 - (D) 40-45%
68. Which of the following statement is correct regarding the initiative “Bee corridors” ?
- (A) Combat ecological stress on pollinators
 - (B) Planting nectar- and pollen-rich native species
 - (C) 24 lakh trees are planned to be planted in 2026-27 to this initiative
 - (D) All of the above

69. In contemporary beekeeping, the most popular technique for extracting honey is :
- (A) Crushing and straining
 - (B) Centrifugal extraction
 - (C) Pressing
 - (D) Boiling
70. Bee Corridors developed by :
- (A) NHAI project
 - (B) NABARD
 - (C) UGC
 - (D) None of the above
71. In North India, litchi is a significant source of honey during :
- (A) January
 - (B) March-April
 - (C) July
 - (D) October
72. Which developmental stage of honey bee is affected by European foulbrood ?
- (A) Adult bees
 - (B) Queen bee
 - (C) Larvae
 - (D) Drone pupae
73. Which bee illness necessitates burning infected colonies to destroy them ?
- (A) Nosema
 - (B) American foulbrood
 - (C) Chalkbrood
 - (D) Sacbrood
74. Black queen cell virus mainly affects :
- (A) Worker bees
 - (B) Adult bees only
 - (C) Drones
 - (D) Queen larvae and pupae
75. The enemy of honey bees that feeds on brood and stored honey is :-
- (A) Ant
 - (B) Honey Wasp
 - (C) Wax moth
 - (D) All of the above
76. Which organization among the following funds beekeeping ?
- (A) National Bee Board
 - (B) Ministry of MSME
 - (C) NABARD
 - (D) All of the above

77. Which of the following procedures must be followed in order to begin a beekeeping project ?
- (A) Education and Planning
 - (B) Site Selection and Setup
 - (C) Acquiring Equipment and Bees
 - (D) All of the above
78. Which species, because of its high productivity and low swarming, is best suited for commercial apiculture ?
- (A) *Apis florea*
 - (B) *Apis dorsata*
 - (C) *Apis cerana indica*
 - (D) *Apis mellifera*
79. Which cast of honey bee consists barbless sting ?
- (A) Workers
 - (B) Queen bee
 - (C) Drone
 - (D) All of the above
80. Which enzyme converts sucrose in nectar into glucose and fructose ?
- (A) Amylase
 - (B) Maltase
 - (C) Invertase
 - (D) Pepsin
81. Which cast of honey bee secretes Bee wax ?
- (A) Drones
 - (B) Queen
 - (C) Workers
 - (D) Larvae
82. Which honey bee species cannot be domesticated easily ?
- (A) *Apis cerana indica*
 - (B) *Apis mellifera*
 - (C) *Apis dorsata*
 - (D) *Apis florea*
83. Which cast is responsible for foraging and wax secretion in honey bee colony ?
- (A) Queen
 - (B) Drone
 - (C) Worker
 - (D) Larva
84. What is the role of drones in a honey bee colony ?
- (A) Collecting pollen
 - (B) Laying eggs
 - (C) Fertilization of queen
 - (D) Protecting the hive

85. Where does the pollen basket located in honey bee ?
- (A) Prothoracic leg
 (B) Mesothoracic leg
 (C) Metathoracic leg
 (D) Union of thorax and abdomen
86. Which of the following cast of bee consist wax glands ?
- (A) Workers
 (B) Drone
 (C) Queen bee
 (D) Both queen and workers bee
87. What is the chemical nature of honey ?
- (A) Alkaline
 (B) Acidic
 (C) Neutral
 (D) Basic after some days
88. "Bee bread" consists of a blend of :
- (A) Honey and wax
 (B) Nectar and saliva
 (C) Pollen, bee saliva and honey
 (D) Royal jelly and wax
89. Who is the father of apiculture ?
- (A) Charles Darwin
 (B) Jagdish Chandra bose
 (C) Johann Dzierzon
 (D) None of the above
90. The dance performs by honey bees to convey the location of food, is known as :
- (A) Break dance
 (B) Acrobatic dance
 (C) Top dance
 (D) Round and waggle dance
91. Online portal for tracking the origin of honey and other products made by bees is known :
- (A) Madhukranti
 (B) Yellow revolution
 (C) Black revolution
 (D) All of the above
92. When the National Bee Board established ?
- (A) 12 August 2002
 (B) 19 July 2000
 (C) 25 December 2005
 (D) 14 March 2019

93. When do beekeepers usually relocate their hives ?
- (A) Midday
 - (B) Night time
 - (C) Early morning
 - (D) Late afternoon
94. Where is the National Bee Board located ?
- (A) Mumbai
 - (B) Kolkata
 - (C) Delhi
 - (D) Lucknow
95. What is the main objective of India's "Sweet Revolution" ?
- (A) Increasing consumption of sugar
 - (B) Reducing honey prices
 - (C) Importing honey
 - (D) Enhancing farmers' income through beekeeping
96. What are the key elements of the National Beekeeping and Honey Mission (NBHM) ?
- (A) Production, processing, and marketing
 - (B) Only honey consumption
 - (C) Exporting queen bees
 - (D) Pesticide application
97. Electrical conductivity is particularly useful in distinguishing :
- (A) Raw vs. processed honey
 - (B) Fresh vs. fermented honey
 - (C) Floral vs. honeydew honey
 - (D) Organic vs. inorganic honey
98. The process of removing the wax capping from honeycomb cells is known as :-
- (A) Rendering
 - (B) Filtering
 - (C) Extraction
 - (D) Uncapping
99. Varroa mite primarily feeds on :
- (A) Honey
 - (B) Wax
 - (C) Fat body tissues
 - (D) Pollen
100. What is the reason behind transportation of bee colonies by beekeepers across regions :
- (A) To follow blooming flowers and increase honey production
 - (B) Reduce transport costs
 - (C) To avoid all pests and diseases
 - (D) To avoid paying taxes on honey

(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 correct 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 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 सही उत्तर छँटना 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।