

Roll No.

Question Booklet Number

O. M. R. Serial No.

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

(Aquaculture) (Elective)

Paper Code							
B	0	5	0	8	0	7	T

Questions Booklet Series
B

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. Seed production of fishes is usually done through :
 - (A) Cage culture
 - (B) Induced breeding
 - (C) Natural spawning
 - (D) Marine hatchery
2. Androgenesis can be induced by :
 - (A) Hormonal therapy
 - (B) Heat shock
 - (C) Antibiotics
 - (D) UV irradiation of eggs
3. The main purpose of sex reversal is :
 - (A) Increase growth rate
 - (B) Control reproduction
 - (C) Produce monosex population
 - (D) All of the above
4. The process of introducing foreign genes into fish is called :
 - (A) Hybridization
 - (B) Mutation
 - (C) Transgenesis
 - (D) Cloning
5. Which fish species shows temperature-dependent sex determination ?
 - (A) Tilapia
 - (B) Salmon
 - (C) Catfish
 - (D) Zebrafish
6. Which hormone gene is commonly transferred to increase fish growth ?
 - (A) Keratin gene
 - (B) Insuline gene
 - (C) Growth Hormone Gene
 - (D) Hemoglobin gene
7. Market-assisted selection helps in :
 - (A) Faster-genetic improvement
 - (B) Reduced heterozygosity
 - (C) Random breeding
 - (D) None of the above
8. The main purpose of producing transgenic fish in aquaculture is to :
 - (A) Stop fish reproduction
 - (B) Increase growth rate and disease resistance
 - (C) Change fish color only
 - (D) Reduce size of fish
9. A common concern about transgenic fish is :
 - (A) Reduced feeding rate
 - (B) Low oxygen consumption
 - (C) Environmental risk if they escape into natural waters
 - (D) Increased water temperature

10. The study of fish disease is called :
- (A) Ichthyology
 - (B) Ichthyopathology
 - (C) Limnology
 - (D) None of the above
11. A transgenic fish is a fish that :
- (A) has no genes
 - (B) contains foreign DNA inserted into its genome
 - (C) is produced only by hybridization
 - (D) lives only in marine water
12. In mollusc culture, what is the primary factor influencing shell growth :
- (A) Salinity
 - (B) Availability of calcium carbonate
 - (C) Temperature
 - (D) Light intensity
13. Transgenic fish technology is an application of :
- (A) Classical genetics
 - (B) Both (A) and (C)
 - (C) Genetic Engineering
 - (D) None of the above
14. The mantle of molluscs plays a key role in :
- (A) Reproduction
 - (B) Digestion
 - (C) Locomotion
 - (D) Shell formation
15. Which environmental condition is most critical for successful mollusc culture ?
- (A) Stable salinity
 - (B) High turbidity
 - (C) Strong water currents
 - (D) Low oxygen levels
16. Which gas decreases due to organic waste decomposition in pond ?
- (A) Nitrogen
 - (B) Oxygen
 - (C) Carbon dioxide
 - (D) Hydrogen
17. Aquaculture refers to :
- (A) Capture fishing only
 - (B) Farming of aquatic organism
 - (C) Hunting marine animals
 - (D) Harvesting seaweed only

18. The air-breathing organ in *Clarias batrachus* is :
- (A) Swim bladder
 - (B) Gill lamellae
 - (C) Accessory respiratory organ
 - (D) Skin
19. Which organism causes white spot/Ich disease in fish ?
- (A) *Ichthyophthirius multifiliis*
 - (B) *Aeromonas*
 - (C) *Flavobacterium*
 - (D) None of the above
20. Dactylogyrus infects mainly :
- (A) Skin
 - (B) Gills
 - (C) Eyes
 - (D) Intestine
21. Swollen abdomen in fishes is symptom of :
- (A) Fin rot
 - (B) Columnaris
 - (C) Dropsy
 - (D) Systemic mycoses
22. Seaweeds grow mainly in :
- (A) Freshwater ponds
 - (B) Marine water
 - (C) Coastal water
 - (D) Both (B) and (C)
23. Which disease is caused by fungal infection in fish eggs ?
- (A) Dropsy
 - (B) Saprolegniasis
 - (C) Vibriosis
 - (D) Argulosis
24. Typical salinity range for most cultured species (ppt) in aquaculture :
- (A) 0–3
 - (B) 5–12
 - (C) 25–35
 - (D) 40–50
25. White spot disease in fishes identify by :
- (A) White cyst/boil on body
 - (B) Gill bleeding
 - (C) Swollen stomach
 - (D) Black patches
26. Which parasite attaches to the fish skin and sucks blood ?
- (A) Dactylogyrus
 - (B) Gyrodactylus
 - (C) Trichodina
 - (D) Argulus

27. In seaweed aquaculture, the most widely used offshore method is :
- (A) Recirculating tanks
 - (B) Long-line
 - (C) Pond cages
 - (D) Aerated raceways
28. The most common species which used for pearl culture in India is :
- (A) *Pinctada margaritifera*
 - (B) *Pinctada radiata*
 - (C) *Pinctada fucata*
 - (D) *Pinctada maxima*
29. Which property differs most between freshwater and marine water in aquarium ?
- (A) Salinity
 - (B) Color
 - (C) Shape of Tank
 - (D) Hood size
30. The ideal salinity for *Pinctada* culture is :
- (A) 10–15 ppt
 - (B) 16–26 ppt
 - (C) 27–35 ppt
 - (D) 40–50 ppt
31. Eggs that float near surface are called :
- (A) Sessile
 - (B) Pelagic
 - (C) Demersal
 - (D) Benthic
32. Mouthbrooders are :
- (A) Build nests
 - (B) Eat Algae
 - (C) Scatter eggs
 - (D) Hold eggs in mouth for protection
33. The process of inserting nucleus into oyster is called :
- (A) Implantation
 - (B) Seeding
 - (C) Nucleation
 - (D) Grafting
34. Main water quality variables monitored :
- (A) N, P, light, temperature
 - (B) pH and salinity
 - (C) Humidity
 - (D) None of the above

35. The juvenile stage attached to seed strings is called :
- (A) Zoospore
 - (B) Sporeling
 - (C) Smolt
 - (D) Parr
36. First post-harvest step is :
- (A) Brine-freezing
 - (B) Fermentation
 - (C) Washing and drying
 - (D) Roasting
37. Angel fish lay eggs :
- (A) As pelagic drifters
 - (B) Breeding trigger
 - (C) On vertical surfaces
 - (D) In floating bubble-nests
38. Commercial species (Nori) in aquaculture is
- (A) Porphyra
 - (B) Eucheuma
 - (C) Ulva
 - (D) Laminaria
39. When dissolved Nitrite in the water is abnormally high, the condition it causes in fish is :
- (A) High gas
 - (B) Bubbles
 - (C) Gas bubble disease
 - (D) Brown Blood Disease
40. Role of genomics in aquaculture is to :
- (A) enhance nutritional content
 - (B) study the genetic makeup of fish
 - (C) Both (A) and (B)
 - (D) None of the above
41. Breeding method which helps in maintaining genetic diversity is :
- (A) Cloning
 - (B) Sex-reversal
 - (C) Inbreeding
 - (D) Hybridization
42. Accumulation of excess feed in aquaculture ponds causes :
- (A) Oxygen depletion
 - (B) Increase in Ammonia
 - (C) Both (A) and (B)
 - (D) None of the above

43. Main supplementary feed used in carp production in pond is :
- (A) Rice bran and oil cake mixture
 - (B) Mustard cake
 - (C) Lime
 - (D) Fish meal
44. Which of the following is not a live-bearing fish ?
- (A) Tetra
 - (B) Molly
 - (C) Platy
 - (D) Guppy
45. Which type of gene is added in fish for disease resistance ?
- (A) Antifreeze gene
 - (B) Antimicrobial gene
 - (C) Receptor gene
 - (D) Dominant gene
46. COD is considered as :
- (A) Carbon and oxygen demand
 - (B) Carbonic oxide demand
 - (C) Chemical oxygen demand
 - (D) None of the above
47. Rearing ponds are used in rear :
- (A) Adult fish
 - (B) Hatchling
 - (C) Brood stock
 - (D) Fry to fingerlings
48. In our country, famous open bundle are located in :
- (A) Bankura (West Bangal)
 - (B) Punjab
 - (C) Goa
 - (D) Assam
49. The most suitable Indian major carps for composite fish culture are :
- (A) Betta, Catla, Mangur
 - (B) Catla, Rohu, Mrigal
 - (C) Hilsa, Prawn, Rohu
 - (D) Murrel, Catla, Mangur
50. Respiration by fish adds CO₂ to the water, this.....pH of the water.
- (A) increases
 - (B) neutralizes
 - (C) decreases
 - (D) does not change the pH

51. Which of the following is a common predator of freshwater mullets ?
- (A) Largemouth bass
 - (B) Spotted seatrout
 - (C) Herons
 - (D) All of the above
52. The optimal salinity range for tiger shrimp culture is :
- (A) 10-20 ppt
 - (B) 20-30 ppt
 - (C) 30-40 ppt
 - (D) 40-50 ppt
53. In a recirculating aquaculture system :
- (A) Culture water is renewed
 - (B) Culture water is reused
 - (C) Fish production is less
 - (D) only Tilapia can be farmed
54. A waste product of protein digestion is :
- (A) Ammonia
 - (B) Nitrogen gas
 - (C) Nitrite
 - (D) Nitrate
55. The major component of shrimp feed are :
- (A) Carbohydrates
 - (B) Minerals
 - (C) Protein
 - (D) Lipids
56. In aquaculture, how much time is required for fry to attain fingerling size ?
- (A) 25-50 days
 - (B) 30-60 days
 - (C) 40-65 days
 - (D) 50-65 days
57. Which of the following is the suitable area for rearing pond ?
- (A) 0.06 – 0.10 ha
 - (B) 0.10 – 0.15 ha
 - (C) 0.08 – 0.12 ha
 - (D) 0.09 – 0.15 ha
58. Which of the following is a benefit of freshwater mullet culture ?
- (A) Fast growth rate
 - (B) High market demand
 - (C) Low feed conservation ratio
 - (D) All of the above

59. Scientific name of tiger shrimp is.....
- (A) *Penaeus japonicus*
 (B) *Penaeus monodon*
 (C) *Penaeus indicus*
 (D) *Penaeus vannamei*
60. Which water parameter is most important for fish survival ?
- (A) Dissolved oxygen
 (B) Wind direction
 (C) Cloud cover
 (D) Soil color
61. Mariculture is a culture of :
- (A) Pisces
 (B) Apis
 (C) Prawn
 (D) Bombyx
62. The main aim of aquaculture is to :
- (A) Increases forest area
 (B) Produce aquatic food organisms
 (C) Reduce water usage
 (D) Improve soil fertility
63. Composite fish culture mainly involves :
- (A) Only marine fishes
 (B) Only exotic fishes
 (C) Only carnivorous fishes
 (D) Combination of compatible species in one pond
64. The most common culture system in our country is :
- (A) Ice culture
 (B) Desert culture
 (C) Pond culture
 (D) Glacier culture
65. pH suitable for fish culture is :
- (A) 1–2
 (B) 2–3
 (C) 9.5–11.5
 (D) 6.5–8.5
66. Fish-cum-poultry system improve :
- (A) Fish disease
 (B) Nutrient availability
 (C) Water loss
 (D) Soil erosion

67. Fish health management includes :
- (A) Disease control
 - (B) Water monitoring
 - (C) Feed management
 - (D) All of the above
68. Pen culture is similar to :
- (A) Cage culture
 - (B) Mining
 - (C) Foresting
 - (D) Farming
69. Protein is important for :
- (A) Growth
 - (B) Colour
 - (C) Sound
 - (D) Light
70. Fish feed contains :
- (A) Protein
 - (B) Lipid
 - (C) Carbohydrates
 - (D) All of the above
71. The most common inland water body used for aquaculture in India is :
- (A) River
 - (B) Pond
 - (C) Marine
 - (D) Glacier
72. Inland fisheries are mainly practiced in :
- (A) Freshwater bodies
 - (B) Marine water
 - (C) Ice field
 - (D) None of the above
73. A partially enclosed coastal body of river and sea is called :
- (A) Delta
 - (B) Basin
 - (C) Estuary
 - (D) Plateau
74. Which inland water body is formed due to river meandering ?
- (A) Oxbow lake
 - (B) Canal
 - (C) Reservoir
 - (D) Glacier lake
75. Father of composite fish culture in India :
- (A) Dr. Verghese Kurien
 - (B) Dr. Hiralal Chaudhary
 - (C) Dr. M. S. Swaminathan
 - (D) Dr. Salim Ali

76. Freshwater aquaculture mainly uses :
- (A) Marine
 - (B) Glacier
 - (C) Iceland
 - (D) Ponds, tanks, reservoirs
77. The early life stage after larvae is called :
- (A) Fry
 - (B) Fingerling
 - (C) Adult
 - (D) Broodstock
78. Nursery ponds are used for :
- (A) Catching fish
 - (B) Rearing fish seed
 - (C) Selling fish
 - (D) Storing equipment
79. Induced breeding is also known as :
- (A) Capture fishing
 - (B) Natural fishing
 - (C) Artificial breeding
 - (D) Cage culture
80. Seed production is important for :
- (A) Mining
 - (B) Aquaculture development
 - (C) Industry
 - (D) Forestry
81. Oyster seed is called :
- (A) Spat
 - (B) Fry
 - (C) Larvae
 - (D) Fingerlings
82. A key environmental benefit of mussel and oyster farming :
- (A) Increase nutrient loading
 - (B) Reduction of nitrogen from coastal water
 - (C) Reduction in water salinity
 - (D) Increase in CO₂ levels
83. Extremely high or low pH may cause :
- (A) Rapid growth
 - (B) Increase salinity
 - (C) Fish mortality
 - (D) No effect

84. Proper feeding management reduces :
- (A) Oxygen
 - (B) Water quality
 - (C) Fish growth
 - (D) Ammonia build up
85. The most common hormone used to induce breeding in India's major carps is :
- (A) Estrogen
 - (B) Insulin
 - (C) Melatonin
 - (D) Ovaprim
86. When dissolved nitrite in the water is abnormally high the condition it causes in fish is ?
- (A) Brown blood disease
 - (B) Gas bubble disease
 - (C) Gas bubble trauma
 - (D) Ichthyophthiriasis
87. Father of Ichthyology in India is :
- (A) Dr. M. S. Swaminathan
 - (B) Dr. Hiralal Chaudhary
 - (C) Dr. Francis Day
 - (D) None of the above
88. Sex-reversal in fish is most effective during this stage :
- (A) Fry
 - (B) Fingerling
 - (C) Larval
 - (D) Adult
89. In which state of our country air breathing fishes are cultured ?
- (A) Punjab
 - (B) West Bengal
 - (C) Gujarat
 - (D) Assam
90. In aquaculture, temperature affects water quality by influencing :
- (A) The solubility of dissolve oxygen
 - (B) The toxicity of ammonia
 - (C) The rate of organic matter decomposition
 - (D) All of the above
91. The natural habitat of *Osteobrama belangeri* is :
- (A) Deep Ocean
 - (B) Shallow ocean
 - (C) Brackish water and rivers
 - (D) Cold mountain streams

92. Sex reversal is important for :
- (A) Preventing unwanted reproduction
 - (B) Genetic studies
 - (C) Enhancing growth
 - (D) All of the above
93. Androgenesis involves offspring developing from :
- (A) Maternal genome only
 - (B) Paternal genome only
 - (C) Hybrid genomes
 - (D) Both (A) and (B)
94. *Osteobrama belangeri* is a fish which found in this region of India :
- (A) Northeast India
 - (B) Western ghats
 - (C) Eastern ghats
 - (D) Southern ghats
95. Which molecular tool is widely used in aquaculture genetic ?
- (A) PCR
 - (B) CRISPR
 - (C) Microsatellites
 - (D) All of the above
96. The primary purpose of gynogenesis in aquaculture is :
- (A) Increase heterozygosity
 - (B) Produce homozygous lines
 - (C) Enhance hybrid vigor
 - (D) Prevent inbreeding
97. Which fish species has been successfully reproduced via androgenesis ?
- (A) Zebrafish
 - (B) Salmon
 - (C) Catla
 - (D) Tilapia
98. Conservation and culture of *Osteobrama belangeri* is important because :
- (A) It lives only cold water
 - (B) It grows very slowly
 - (C) It is endangered in natural habitats
 - (D) It is poisonous
99. Which hormone is commonly used for induced breeding ?
- (A) Insuline
 - (B) Cortisol
 - (C) Pituitary extract
 - (D) Thyroxine
100. Which of the following is a limitation of gynogenesisic ?
- (A) Reduced genetic diversity
 - (B) High fertility
 - (C) Increased heterozygosity
 - (D) Rapid growth

(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।