

Sikkim Public Service Commission

Main Written Examination for the Post of Assistant Director (Fisheries)

Paper - II

Time Allowed : 3 Hrs.

Maximum Marks : 300

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before answering the questions :-

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. Please note that it is the candidate's responsibility to fill in the Roll Number and Test Booklet Serial Number carefully and without any omission or discrepancy at the appropriate places in the **OMR ANSWER SHEET**.
3. **Use only Black Ball Point Pen to fill the OMR sheet**
4. Do not write anything else on the OMR Answer Sheet except the required information.
5. **This Test Booklet contains two Sections i.e Section A and B. Section A contains Multiple choice Questions i.e. 100 items in MCQ Mode to be marked in OMR Sheet. Section B contains Conventional/Subjective Type of Questions which has to be written in Seperate Answer sheet provided to you.**
6. **All items from Q.1 to 100 carries 2 marks each.**
7. Before you proceed to mark in the Answer Sheet (OMR), you have to fill in some particulars in the Answer Sheet (OMR) as per given instructions.
8. After you have completed filling in all your responses on the Answer Sheet (OMR) and the examination has concluded, you should hand over the Answer Sheet (OMR) and the Seperate conventional Answer sheet to the Invigilator only . You are permitted to take away with you the Test Booklet.
9. **Marking Scheme**
There will be negative marking for wrong answers marked by a candidate in the objective type question papers.
 - (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, one-third of the marks assigned to that question will be deducted as penalty.
 - (ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above to the question.
 - (iii) If a question is left blank. i.e., no answer is given by the candidate, there will be no penalty for that question.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

Paper - II
Section - A

Objective Type Questions

(100 × 2 = 200)

1. **In detritus food chain first trophic level is-**
A. Bacteria
B. Algae
C. Protozoa
D. Nematodes
2. **Pond water is most acidic at-**
A. Dawn
B. Mid-day
C. Dusk
D. Mid-night
3. **Non symbiotic nitrogen fixing bacteria is-**
A. Rhizobium
B. Anabaena
C. Azotobacter
D. Azolla
4. **Warm monomictic lakes undergo circulation during-**
A. Summer
B. Autumn
C. Winter
D. Spring
5. **The organisms swimming on the surface of water are called-**
A. Nekton
B. Plankton
C. Neuston
D. Pleuston
6. **Domestic sewage is rich in-**
A. Heavy metals
B. Coliform bacteria
C. Retrovirus
D. Nematodes
7. **The particle size of silt ranges between-**
A. 0.002-0.02 mm
B. 0.02-2.0 mm
C. Less than 0.002 mm
D. More than 2.0 mm
8. **The shallow, marginal water zone of lake where light reaches up to bottom is called as-**
A. Limnetic zone
B. Euphotic zone
C. Littoral zone
D. Profundal zone
9. **Thermal stratification is most commonly displayed by-**
A. Shallow lakes
B. Deep lakes
C. Ponds
D. Rivers

10. NPP (Net Primary Productivity) is zero at-
- A. Limnetic zone
 - B. Chemoline
 - C. Thermocline
 - D. Compensation point
11. Considered as father of limnology is-
- A. Welch
 - B. Forbes
 - C. Forel
 - D. Leeuwenhock
12. Predatory fish belong to the trophic level-
- A. IInd
 - B. IIIrd
 - C. IVth
 - D. IIIrd & IVth
13. Most toxic form of nitrogen is-
- A. Ionized ammonia
 - B. Unionized ammonia
 - C. Nitrite
 - D. Nitrate
14. The bacterial activity becomes slow when C:N ration falls below-
- A. 5:1
 - B. 10:1
 - C. 15:1
 - D. 18:1
15. The optimum pH for Spirulina culture is-
- A. 6-7
 - B. 8-9
 - C. 10-11
 - D. 11-12
16. The concept of ecological pyramid was first introduced by-
- A. E.P. Odum
 - B. Weber
 - C. Charles Elton
 - D. E. Haeckel
17. Super saturation of nitrogen and oxygen causes-
- A. EUS
 - B. Gas bubble diseases
 - C. Furunculosis
 - D. Ulcer
18. The most suitable soil for Bundh construction is-
- A. Sandy soil
 - B. Clayey soil
 - C. Heavy loam
 - D. Sandy loam
19. Phenomena of 'cyclomorphosis' is observed in-
- A. Rotifers
 - B. Cladocerans
 - C. Copepods
 - D. Both (A) & (B)

20. All particulate materials in water are categorized as-
 - A. Neuston
 - B. Seston
 - C. Tripton
 - D. Krypton
21. The spring bloom generally has dominance of-
 - A. Flagellates
 - B. Diatoms
 - C. Blue green algae
 - D. Green algae
22. Productive waters have a C/N ratio in the range-
 - A. 1-5
 - B. 5-10
 - C. 10-15
 - D. 15-20
23. Bicarbonates are dominant in the pH range of-
 - A. 3 to 5
 - B. 5 to 7
 - C. 7 to 9
 - D. 9 to 11
24. The most important factor for a successful probiotic is-
 - A. Viability
 - B. Colonisation
 - C. Stabilisation
 - D. Compatibility
25. Mustard oilcake is deficient for fish in-
 - A. Leucine
 - B. Valine
 - C. Methionine
 - D. Lysine
26. Fish pond soil containing 25-50 mg nitrogen per 100 g soil is categorized as-
 - A. Highly fertile
 - B. Medium fertile
 - C. Low fertile
 - D. Sterile
27. Most important for growth of diatoms is-
 - A. Chloride
 - B. Silica
 - C. Potassium
 - D. Calcium
28. First commercially registered fish vaccine was developed against-
 - A. Enteric red mouth
 - B. Vibriosis
 - C. Furunculosis
 - D. Spring viremia of carp
29. Labeo rohita occupies place in world aquaculture production-
 - A. Fourth
 - B. Sixth
 - C. Tenth
 - D. Twentieth
30. Costia necatrix is parasitic protozoa-
 - A. Flagellate
 - B. Ciliate
 - C. Sporozoan
 - D. None of the above

31. Scientific name of black carp is-
- | | |
|-------------------------------|---------------------------|
| A. Hypophthalmichthys nobilis | B. Cirrhinus molitorella |
| C. Ctenopharyngodon idella | D. Mylopharyngodon piceus |
32. Normal concentration of pituitary glands in PG extract remains-
- | | |
|-------------|-------------|
| A. 1 mg/mg | B. 20 mg/ml |
| C. 50 mg/ml | D. 1 g/ml |
33. Eel feed is given in the form of-
- | | |
|------------|-------------|
| A. Powder | B. Granules |
| C. Pellets | D. Paste |
34. Argulus foliaceus is-
- | | |
|----------------|----------------|
| A. Isopod | B. Copepod |
| C. Branchiuran | D. Coleopteran |
35. The toxicity of ammonia in water can be reduced by-
- | | |
|--|--|
| A. Increasing temperature | B. Increasing pH |
| C. Increasing free CO ₂ concentration | D. Decreasing dissolved O ₂ |
36. Columnaris disease is also known as-
- | | |
|----------------------|------------------------|
| A. Red mouth disease | B. Cotton wool disease |
| C. Dropsy | D. White patch disease |
37. Ranatra is a-
- | | |
|----------------|---------------|
| A. Coleopteran | B. Odonate |
| C. Hemipteran | D. Monogenean |
38. In ponds made of medium productive soil, yearly requirement of phosphorus is-
- | | |
|---------------|---------------|
| A. 50-70 kg | B. 75-100 kg |
| C. 100-125 kg | D. 150-200 kg |
39. White patch disease of shrimp is caused by-
- | | |
|------------------------|-----------------------|
| A. Monodon baculovirus | B. Baculovirus pineal |
| C. Type C baculovirus | D. SEM baculovirus |
40. Vitamin A is-
- | | |
|------------------|---------------|
| A. Ascorbic acid | B. Tocopherol |
| C. Retinol | D. Pyridoxine |

41. Primary causative agent of epizootic ulcerative syndrome (EUS) in fish is-
- | | |
|--------------------------------|--------------------------------|
| A. <i>Aeromonas hydrophila</i> | B. <i>Rhabdovirus carpio</i> |
| C. <i>Edwardsiella tarda</i> | D. <i>Aphanomyces invadans</i> |
42. Removal of piscivorous fish can change lake water from-
- | | |
|------------------------|-------------------|
| A. Green to dark green | B. Clear to green |
| C. Blue to green | D. Green to clear |
43. Common name of *Macrobrachium rosenbergii* is-
- | | |
|---------------------------|---------------------|
| A. Tiger prawn | B. White leg shrimp |
| C. Freshwater giant prawn | D. Indian prawn |
44. The egg bearing female prawns are generally called as-
- | | |
|------------------|-----------------|
| A. Berried prawn | B. Brood prawn |
| C. Ripped prawn | D. Gravid prawn |
45. *Chanos chanos* feeds on-
- | | |
|----------------|-------------|
| A. Detritus | B. Plankton |
| C. Periphytons | D. Lab-lab |
46. Decomposers or the micro-consumers are also called as-
- | | |
|----------------------|------------------------|
| A. Primary consumers | B. Secondary consumers |
| C. Saprobies | D. Detritivores |
47. One of the following trace element is most essential for cyanophytes-
- | | |
|-----------|---------------|
| A. Cobalt | B. Nickel |
| C. Iron | D. Molybdenum |
48. The organisms that attach firmly to a substrate without penetrating it, are collectively called-
- | | |
|----------------|-------------|
| A. Neuston | B. Benthos |
| C. Microphytes | D. Aufwuchs |
49. In some lakes during winter the ice is at the surface and warmest water at the bottom, because of-
- | | |
|---------------------------|-----------------------|
| A. Eutrophication | B. Nutrient depletion |
| C. Inverse stratification | D. Oxygen depletion |
50. Steps not included in tertiary treatment of sewage is-
- | | |
|----------------------|----------------------|
| A. Precipitation | B. Nitrogen tripping |
| C. Carbon absorption | D. Aeration |

61. Packing density of 3 cm long fry of IMC for 12 hr transport should be-
A. 80 per bag
B. 225 per bag
C. 330 per bag
D. 600 per bag
62. Artificial fertilization technology for trout in the year 1765 was developed by-
A. H.B. Wilson
B. S.L. Jacobi
C. Francis Day
D. J. Hamilton
63. The active ingredients of ovaprim are-
A. sGnRHa + Domperidone
B. LHRH + Pimozide
C. LHRAa + Dopamine
D. LHRH + GH
64. Age for 1st maturity of Indian major carp usually is-
A. 6 month
B. 1 year
C. 2 years
D. More than 4 years
65. Yolk-sac resorption in hatchlings of rohu takes-
A. 24 hrs
B. 1 day
C. 2 days
D. 3 days
66. Active ingredient of Pituitary Extract (PE) responsible for induction of breeding in fishes is-
A. GnRH
B. GRIF
C. GTH
D. ACTH
67. 'Hypophysation' in relation to induced breeding is use of-
A. Ovaprim
B. HCG
C. Pituitary Extract
D. Hypothalamus
68. Eyestalk ablation in crustaceans is related to-
A. Growth
B. Feeding
C. Gonadal maturity
D. Gonadal regression
69. White leg shrimp is-
A. Macrobrachinus rosenbergii
B. Penaeus indicus
C. Metapenaeus vennamei
D. Penaeus monodon
70. Protogynous hermaphroditism is common feature of-
A. Milk fish
B. Grouper
C. Hilsa
D. Tilapia

71. *Anadara granosa* is commonly known as-
A. Butter clam
B. Blood clam
C. Blue clam
D. Globosa clam
72. Pediveliger larvae is the stage of-
A. Oyster
B. Shrimp
C. Crab
D. Sea cucumber
73. Fungus infection of shrimp is-
A. Costiasis
B. Ichthyophthiriasis
C. Legnidium
D. Vibriosis
74. Sea bass sexually is-
A. Bisexual
B. Simultaneous hermaphrodite
C. Protoandrous hermaphrodite
D. Protogynous hermaphrodite
75. Salinity tolerance range of *Litopenaeus vennamei* is-
A. 0-50 ppt
B. 25-75 ppt
C. 50-100 ppt
D. 75-125 ppt
76. Fish species endemic to North East India is-
A. *Notopterus notopterus*
B. *Labeo calbasu*
C. *Anabas testudineus*
D. *Osteobrama belangeri*
77. Largest freshwater lake of NE India is-
A. Rudrasagar, Tripura
B. Ganga, Arunachal Pradesh
C. Umiam, Meghalaya
D. Loktak, Manipur
78. A Ramsar site from NE India is-
A. Deepor beel
B. Loktak lake
C. Shiloi lake
D. Both (A) & (B)
79. State Fish of Arunachal Pradesh is-
A. *Ompok pabda*
B. *Tor putitora*
C. *Clarias magur*
D. *Chitala chitala*
80. Number of fish species reported from North East India is-
A. 800
B. 515
C. 267
D. 126

81. Fish species cultured in traditional paddy-cum-fish culture in NE India is-
- | | |
|-----------|----------------|
| A. Rohu | B. Common carp |
| C. Mrigal | D. Silver carp |
82. Tor species not found in NE India is-
- | | |
|------------------|----------------|
| A. Tor putitora | B. Tor tor |
| C. Tor progenies | D. Tor khudree |
83. Renowned indigenous game fish is-
- | | |
|-----------------------|--------------------------|
| A. Tor putitora | B. Onchorhynchus mykiss |
| C. Salmo trutta fario | D. Salvelinus fontinalis |
84. Fecundity of Tor putitora is-
- | | |
|--------------|------------------|
| A. 10,000 | B. 4000-5000 |
| C. 1000-2000 | D. 14,000-15,000 |
85. One of the following is known as snow trout-
- | | |
|------------------------------|-----------------------|
| A. Onchorhynchus mykiss | B. Raimas bola |
| C. Schizothorax richardsonii | D. Salmo trutta fario |
86. Green eggs are related to-
- | | |
|--------------------|------------------|
| A. Golden mahseer | B. Rainbow trout |
| C. Striped catfish | D. Pengba |
87. Patlikuhl trout hatchery is located in-
- | | |
|----------------|---------------------|
| A. Uttarakhand | B. Sikkim |
| C. Kerala | D. Himachal Pradesh |
88. In India, brown trout spawns during-
- | | |
|---------------------|------------------------|
| A. February-March | B. July-August |
| C. December-January | D. Throughout the year |
89. Scientific name of Katli fish is-
- | | |
|---------------------------------|-----------------|
| A. Tor tor | B. Badis badis |
| C. Neolissochilus hexagonolepis | D. Bangana dero |
90. After keeping in 5% glacial acetic acid for 24 hrs, the fertilized eggs of trout become-
- | | |
|----------------|----------|
| A. Translucent | B. Black |
| C. Transparent | D. Green |

91. Male rainbow trout brooder can be identified by-
- A. Fins
 - B. Jaw
 - C. Body shape
 - D. Colour
92. Upper water temperature limit for successful farming of rainbow trout is-
- A. 15°C
 - B. 20°C
 - C. 25°C
 - D. 30°C
93. Yolk-sac absorption in rainbow trout alevins takes-
- A. 1 day
 - B. 2-3 days
 - C. 5-7 days
 - D. 10-12 days
94. Diameter of water hardened egg of brown trout is about-
- A. 2 mm
 - B. 4 mm
 - C. 8 mm
 - D. 12 mm
95. Menmoitso brown trout hatchery is located in-
- A. Arunachal Pradesh
 - B. Jammu & Kashmir
 - C. Sikkim
 - D. Assam
96. State Fish of Manipur is-
- A. Osteobrama belangeri
 - B. Semiplotus manipurensis
 - C. Chagunius chagunio
 - D. Labeo pangusia
97. Average yield of eggs per kg body in brown trout is around-
- A. 1200
 - B. 1500
 - C. 3500
 - D. 10,000
98. Breeding in rainbow trout is carried out by-
- A. Hypophysation
 - B. Natural way
 - C. Dry stripping
 - D. Wet stripping
99. Incubation period in rainbow trout eggs at 7-11°C water temperature is-
- A. 15-20 days
 - B. 20-30 days
 - C. 40-60 days
 - D. 60-80 days
100. The crude protein level in crumbles for fry and fingerlings of trout should be-
- A. 35-40%
 - B. 30-35%
 - C. 28-30%
 - D. 25-28%

Section - B

M.M. 100

(10 × 5 = 50)

1. Write short notes on any ten of the following:

- (i) Food Conversion Ratio (FCR)
- (ii) Viral diseases of trout
- (iii) Circular carp hatchery
- (iv) Breeding and seed production of trout
- (v) Culture of murels
- (vi) Primary productivity
- (vii) Polyculture of carps
- (viii) Intensive fish farming
- (ix) Ovaprim
- (x) Larval development of freshwater prawn
- (xi) Mud crab culture
- (xii) Duck-cum-fish culture
- (xiii) Fish seed transportation
- (xiv) Recent techniques of micro-algal culture

2. Describe any five of the following in detail.

(5 × 10 = 50)

- (i) Nutritional requirements of Indian major carps and trout.
- (ii) Raceway culture of trout and its scope in North-East especially Sikkim.
- (iii) Use of synthetic hormones for induced fish breeding and their advantages over the conventional pituitary gland extract.
- (iv) Techniques of seed production of air-breathing Asian catfish *Clarias magur*.
- (v) Technique of freshwater prawn farming and its scope.
- (vi) Concept of habitat, ecological niche and trophic structure in relation to management of aquatic ecosystems.
- (vii) Analytical techniques used for the study of nutrient cycling in water bodies.
- (viii) Diagnostic, therapeutical and prophylactic measures for finfish and shellfish bacterial and viral diseases.
- (ix) Concepts of integrated fish farming, its prospects and problems in North-East.
- (x) Different species of mahseer and their breeding biology. Seed production and culture scope of golden mahseer.