

MIZORAM PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF ASSISTANT DIRECTOR OF FISHERIES / DISTRICT FISHERIES DEVELOPMENT OFFICER UNDER FISHERIES DEPARTMENT, GOVERNMENT OF MIZORAM. FEBRUARY, 2021

FISHERIES PAPER - I

Time Allowed : 2 hours

Full Marks : 200

*All questions carry equal marks of 2 each.
Attempt all questions.*

- The simplest indicator of species diversity is:
 - abundance of different organisms
 - number of individuals
 - species richness
 - intrinsic variation
- Chemically, aragonite is:
 - calcium carbonate
 - magnesium chloride
 - magnesium nitrate
 - sodium nitrate
- Some examples of toxins produced by marine phytoplanktons are:
 - tetrodotoxin, saxitoxin, batrachotoxin
 - brevetoxin, ciguatoxin, saxitoxin
 - batrachotoxin, cupiennin, ciguatoxin
 - cyanide, brevetoxin, tarichatoxin
- The Millennium Ecosystem Assessment 2005 involves evaluation of:
 - human impact on environment
 - diversity of global fish
 - trend of fish farming and fish products
 - quality of fishes and their environment
- Kelp forests are formed by:
 - mangroves
 - perennial alpine trees
 - canes and bamboos
 - seaweed
- A lung-like organ in some fish for breathing in air is:
 - labyrinth
 - Eustachian tube
 - thymus
 - larynx
- The number of gills in Chondrichthyes such as sharks, rays, sawfish, etc. is:
 - 3 pairs
 - 5 to 7 pairs
 - 2 pairs
 - 8 to 10 pairs
- Ampullae of Lorenzini are functionally:
 - osmoregulatory organs
 - photoreceptors
 - electroreceptors
 - buoyancy regulators
- Antifreeze glycoproteins in some fishes confer protection from freezing by:
 - increasing basal body temperature
 - binding ice crystals
 - enhancing muscular contraction
 - increasing haemoglobin synthesis
- Which of the following statements about eicosapentaenoic acid is false?
 - it is a type of omega-3 fatty acid
 - it is a precursor of prostaglandin
 - it is a hydrolysis product of eicosanoids
 - it is a Food and Drug Administration-approved medication

11. An in-pond raceway system is meant for improvements of:
 - (a) dissolved oxygen and water exchange
 - (b) pituitary extracts
 - (c) quality of planktons
 - (d) irrigation and nursery management
12. The first Cargill fish feed plant in India is located in:
 - (a) Lucknow
 - (b) Vijayawada
 - (c) Visakhapatnam
 - (d) Kochi
13. The major shrimps produced in the world are:
 - (a) *Litopenaeus Vannamei* and *Penaeus Monodon*
 - (b) *Penaeus Monodon* and *Palaemon serratus*
 - (c) *Palaemon serratus* and *Macrobrachrium malcolmsonii*
 - (d) *Macrobrachrium rosenbergii* and *Litopenaeus Vannamei*
14. The largest producer of seaweed in India is:
 - (a) Maharashtra
 - (b) Karnataka
 - (c) Gujarat
 - (d) Tamil Nadu
15. The annual fishing ban in India lasts for:
 - (a) 31 days
 - (b) 47 days
 - (c) 50 days
 - (d) 61 days
16. The protocol for limiting fishing is known as:
 - (a) Sustainable Fishing Method
 - (b) Balanced Economic Fishing
 - (c) Harvest Control Rules
 - (d) Eco-dynamic Utilization
17. The United Nations' project on the management of water resources (Life Below Water) is specified under:
 - (a) Economic Improvement Forum 14
 - (b) Global Development Project 14
 - (c) Large-Scale Protection Act 14
 - (d) Sustainable Development Goal 14
18. The largest aquaculture industry is in:
 - (a) Japan
 - (b) China
 - (c) India
 - (d) Peru
19. Fisheries in India contribute to the national gross domestic product at about:
 - (a) 1%
 - (b) 3%
 - (c) 7%
 - (d) 10%
20. A mass of fish eggs used for caviar is known as:
 - (a) ovule
 - (b) roe
 - (c) omega
 - (d) rostrum
21. The United Nations Convention on the Law of the Sea (UNCLOS) was implemented in:
 - (a) 1989
 - (b) 1991
 - (c) 1994
 - (d) 1997
22. An area of the sea rightfully governed by a sovereign state is termed:
 - (a) exclusive economic zone
 - (b) core continental shelf
 - (c) water administration cell
 - (d) enclosed maritime boundary
23. A fish species that has become IUCN-categorised "Endangered" is:
 - (a) Atlantic salmon (*Salmo salar*)
 - (b) Chilean jack mackerel (*Trachurus murphyi*)
 - (c) Atlantic bluefin tuna (*Thunnus thynnus*)
 - (d) Atlantic herring (*Clupea harengus*)

24. The disadvantage and danger of bottom trawling is:
- (a) destruction of habitat
 - (b) excessive bycatch
 - (c) unethical handling
 - (d) toxic contamination
25. Coral reef that is directly attached to the shore is:
- (a) barrier reef
 - (b) platform reef
 - (c) fringing reef
 - (d) atoll
26. An ideal number of males and females in a broodstock would be:
- (a) 10 to 50
 - (b) 50 to 500
 - (c) 500 to 1000
 - (d) 1000 to 2000
27. Hardness of water in a hatchery can be increased by adding:
- (a) calcium carbonate
 - (b) magnesium chloride
 - (c) sodium chloride
 - (d) potassium hydroxide
28. It is important to prevent inbreeding during seed production because it:
- (a) enhances undesirable genetic hybrids
 - (b) increases food consumption and energy metabolism
 - (c) reduces growth rate and disease resistance
 - (d) increases aging and intolerance to environmental changes
29. A genetically improved *Labeo rohita* seed introduced in 1997 is called:
- (a) Brahmaputra Rohu
 - (b) Labeo Robustus
 - (c) Labeo Desi
 - (d) Jayanti Rohu
30. Which of the following statements about minor carps and barbs is true?
- (a) they are difficult to breed
 - (b) they cannot be mixed culture with other fishes
 - (c) they have short harvestable size of 6 months
 - (d) they are cheap and difficult in marketing
31. In fish, new blood cells are formed in the:
- (a) hepatocytes
 - (b) spleen or head kidney
 - (c) bone marrow
 - (d) pancreas
32. Catadromous refers to migration of fish from:
- (a) sea to freshwater
 - (b) inland water to ponds
 - (c) sea to inland water
 - (d) freshwater to sea
33. The wild species that is IUCN-designated "vulnerable" is:
- (a) *Sarotherodon galilaeus* (mango tilapia)
 - (b) *Oreochromis niloticus* (Nile tilapia)
 - (c) *Oncorhynchus mykiss* (rainbow trout)
 - (d) *Cirrhinus cirrhosus* (mrigal carp)
34. Shellfishes are also dangerous because they are common:
- (a) hallucinogens
 - (b) allergens
 - (c) pathogens
 - (d) carcinogens
35. In a food chain, shellfish would be technically considered as:
- (a) primary producers
 - (b) primary consumer
 - (c) secondary consumer
 - (d) tertiary consumers
36. The term aquarium was coined by:
- (a) Ernst Haeckel
 - (b) Charles Robert Darwin
 - (c) Robert Warington
 - (d) Philip Henry Gosse
37. The chemical basis of biofilter in aquarium is to:
- (a) convert ammonia to nitrate
 - (b) promote bacterial growth
 - (c) induce plankton concentration
 - (d) increase oxygen supply

38. Goldfish are good aquarium pets because they can:
- (a) survive in toxic environment
 - (b) reproduce quickly
 - (c) tolerate oxygen-less water
 - (d) increase glycogen metabolism
39. Detoxification of nitrogenous waste in aquarium is mainly done by bacteria of the genus:
- (a) *Nitrosomanas*
 - (b) *Nitrobacter*
 - (c) *Nitrospira*
 - (d) *Nitronella*
40. The use of water conditioner is basically to remove:
- (a) chlorine or chloramine
 - (b) ammonia
 - (c) nitrates and nitrites
 - (d) calcium deposits
41. Lordosis and scoliosis are mainly caused by deficiency of:
- (a) glycoproteins
 - (b) vitamin E
 - (c) calcium
 - (d) fatty acids
42. Exophthalmia of fish is related to a disease of the:
- (a) vertebrae
 - (b) eyes
 - (c) fins
 - (d) gills
43. Cyclopropenoid fatty acids such as sterculic and malvalic acids in fish diet can:
- (a) enhance growth
 - (b) increase oxygen uptake
 - (c) stunt growth
 - (d) strengthen bones
44. Carotenoids are vitally important in primary producers because they can:
- (a) promote carbohydrate metabolism
 - (b) make better carrots
 - (c) increase vitamin A
 - (d) absorb light energy
45. Photosynthesis is carried out in reaction known as:
- (a) Calvin cycle
 - (b) Krebs cycle
 - (c) Kelvin cycle
 - (d) TCA cycle
46. The pineal gland secretes a hormone called:
- (a) melanin
 - (b) somatostatin
 - (c) melatonin
 - (d) leptin
47. Stress in fishes is due to accumulation of:
- (a) progesterone
 - (b) glucagon
 - (c) thyroxin
 - (d) cortisol
48. A hormone that controls calcium level is:
- (a) aldosterone
 - (b) parathyroid hormone
 - (c) juvenile hormone
 - (d) estradiol
49. Osmoregulation in freshwater is largely controlled by:
- (a) prolactin
 - (b) aldosterone
 - (c) androgens
 - (d) pregnenolone
50. A moulting hormone secreted by prothoracic gland is:
- (a) testosterone
 - (b) corticosteroid
 - (c) ecdysone
 - (d) oxytocin
51. Karyotyping is a method of:
- (a) organising photographs
 - (b) enumerating chromosomes
 - (c) determining DNA level
 - (d) assigning species by genetic relatedness

52. A study of genetic change without involving changes in DNA sequence is known as:
- (a) eugenics
 - (b) epigenetics
 - (c) population genetics
 - (d) horizontal gene transfer
53. Genetic recombination refers to a process of:
- (a) pairing and exchange between homologous chromosomes
 - (b) fusion of two or more genes on the chromosome
 - (c) gene transfer from one locus to another on a chromosome
 - (d) mutation of multiple DNA segments at a time
54. During crossing over, two chromosomes make contact at a point called:
- (a) synapse
 - (b) chromatid
 - (c) chiasma
 - (d) crista
55. Haploid egg cells that are not involved in fertilisation are called:
- (a) zygotes
 - (b) ovules
 - (c) oogonia
 - (d) polar bodies
56. The source of pearl in mollusk body is:
- (a) shell
 - (b) mantle
 - (c) statocyst
 - (d) pericardium
57. In aquaculture, aquaponics refers to:
- (a) egg-harvesting technique
 - (b) sophisticated rearing process
 - (c) in vitro culture method
 - (d) food production system
58. The number of larval stages in *Macrobrachium rosenbergii* is:
- (a) 7
 - (b) 9
 - (c) 11
 - (d) 13
59. Bheri refers to:
- (a) a type of fishing net
 - (b) a large culture tank
 - (c) a traditional fish farming method
 - (d) a process of spawning shrimps
60. A major viral disease of penaeid shrimp is:
- (a) white spot disease
 - (b) bitter crab disease
 - (c) yellow fever disease
 - (d) paragonimiasis
61. Spirulina as a feed has additional benefits that is:
- (a) it increases carbohydrate
 - (b) it enriches amino acids
 - (c) it is rich in vitamin B12
 - (d) it boosts immunity
62. By habitat adaptation, European bass, *Dicentrarchus labrax*, is:
- (a) thermohaline
 - (b) stenohaline
 - (c) euryhaline
 - (d) poikilohaline
63. The term “cultch” or “cutch” is associated with:
- (a) algal mat
 - (b) fish scale
 - (c) crab shell
 - (d) oyster shell
64. Redfield ratio is concerned with the relative amounts of:
- (a) calcium, potassium, carbon
 - (b) carbon, nitrogen, phosphorus
 - (c) nitrogen, sulphur, calcium
 - (d) sulphur, potassium, carbon
65. Abalone are:
- (a) marine snails
 - (b) freshwater clams
 - (c) marine oysters
 - (d) estuarine shrimps

66. A fishing gear to collect targeted edible bottom-dwelling species is called:
- (a) fishing dredge
 - (b) flosser
 - (c) pa-aling
 - (d) payos
67. Artisanal fishing refers to:
- (a) low-technology traditional fishing practice
 - (b) method of improvised rearing
 - (c) use of poison for killing fish
 - (d) modernised system of catching fish
68. A device for rolling fishing rope or any rope is called:
- (a) spool
 - (b) winch
 - (c) loop
 - (d) spring
69. Bag-shaped nets for fishing are called:
- (a) gillnets
 - (b) lave nets
 - (c) haaf nets
 - (d) fyke nets
70. The largest fishing technique in Mizo traditional practice is:
- (a) bawngdawh
 - (b) suar dan
 - (c) ngawidawh
 - (d) chawnzial
71. A global organisation established in 2010 for ensuring sustainable aquaculture is:
- (a) Ocean Conservancy
 - (b) SeaChoice
 - (c) International Seafood Sustainability Foundation
 - (d) Aquaculture Stewardship Council
72. The Ganges shark (*Glyphis gangeticus*) is assigned by IUCN as:
- (a) vulnerable
 - (b) endangered
 - (c) critically endangered
 - (d) near threatened
73. Global whale catching is regulated by:
- (a) Global Whale Conservation Organization
 - (b) Cetacean Regulatory Commission
 - (c) Whale and Dolphin Conservation
 - (d) International Whaling Commission
74. The lowest region of a water body is known as:
- (a) hadal zone
 - (b) benthic zone
 - (c) lentic zone
 - (d) lotic zone
75. Ocean acidification is caused by increased:
- (a) uptake of carbon dioxide
 - (b) sedimentation of sulphuric acid
 - (c) accumulation of nitric acid
 - (d) seepage of nitrogenous compounds
76. Biological pump refers to:
- (a) a device for oxygen supply
 - (b) the number of primary producers
 - (c) the interlink of food chains
 - (d) carbon cycle of the oceans
77. In fishes, *Pseudomonas fluorescens* is a major causative bacterium of:
- (a) bleeding
 - (b) fin rot
 - (c) tongue rot
 - (d) muscle degeneration
78. Mercury or methylmercury in fishes can be dangerous to human by the process of:
- (a) energy flow
 - (b) cascade effect
 - (c) biomagnification
 - (d) succession
79. Aramid is a:
- (a) synthetic fiber
 - (b) technique of snail culture
 - (c) system of purifying sea water
 - (d) mechanical trap

80. Domoic acid is a neurotoxin produced by:
- (a) salmon
 - (b) helminths
 - (c) fungi
 - (d) diatoms
81. A connection between open sea and rivers or streams is called:
- (a) estuary
 - (b) littoral zone
 - (c) strait
 - (d) demersal zone
82. The chemical basis of eutrophication is mainly the addition of:
- (a) silicates and carbonates
 - (b) chlorides and carbonates
 - (c) nitrates and phosphates
 - (d) sulphates and chlorides
83. An imaginary line connecting all points of equal saltness is called:
- (a) equivalence
 - (b) isohaline
 - (c) eco-salinity
 - (d) homohaline
84. The middle layer of a lake is:
- (a) hypolimnion
 - (b) metalimnion
 - (c) epilimnion
 - (d) perlimnion
85. At profundal zone of a water body, light penetration is:
- (a) maximum
 - (b) optimum
 - (c) limited
 - (d) moderate
86. Pelagic zone comprises only the:
- (a) open sea or ocean
 - (b) coastal area
 - (c) bottom of the sea or ocean
 - (d) sea shore and floor
87. Hypoxic environment is characteristic of:
- (a) limnetic zone
 - (b) littoral zone
 - (c) amictic lake
 - (d) dead zone
88. A mixture of cyanobacteria, algae, protozoa, and organic debris is called:
- (a) diatom
 - (b) periphyton
 - (c) autotroph
 - (d) copepod
89. Sea cucumber, sea star, sea anemones, etc. are examples of:
- (a) zoonektons
 - (b) macrobenthos
 - (c) zooneustons
 - (d) planktons
90. *Daphnia* is a useful bioindicator water quality in terms of:
- (a) chemical toxicity and UV radiation
 - (b) algal bloom and radioactivity
 - (c) eutrophication and industrial contaminants
 - (d) viral and parasitic diseases
91. The solubility of oxygen in water is:
- (a) very high
 - (b) moderate
 - (c) zero
 - (d) poor
92. The farming of freshwater crayfish is known as:
- (a) pisciculture
 - (b) apiculture
 - (c) astaciculture
 - (d) limniculture
93. In white fishes, fats are deposited mainly in the:
- (a) intestine
 - (b) abdomen
 - (c) gill arches
 - (d) liver

94. A reliable method of determining dissolved oxygen in water is:
(a) Shannon-Wiener diversity index (b) Winkler titration
(c) Beer-Lambert test (d) Nernst reaction
95. Oily fishes mostly inhabit:
(a) benthic zone (b) profundal zone
(c) demersal zone (d) pelagic zone
96. *Tilapia* cannot naturally survive in temperate zones because they are:
(a) heat intolerant (b) cold intolerant
(c) heavy rain intolerant (d) wind intolerant
97. A method of releasing juvenile specimens reared in hatcheries and nursery into the sea is:
(a) offshore roaming (b) mooring
(c) sea ranching (d) raceway
98. Dropsy in fish is mostly caused by bacterial infection with:
(a) *Hemophilus* species (b) *Staphylococcus* species
(c) *Streptococcus* species (d) *Pseudomonas* species
99. Marine permaculture mainly involves:
(a) salmon (b) seaweeds
(c) geoducks (d) oysters
100. A crustacean larva that uses antennae for swimming is:
(a) Nauplius (b) Zoea
(c) Cypris (d) Mysis

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