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 - II

Time Allowed : 2 hours Full Marks : 200

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

1. Green water technique means that it employs:
(a) non-chemical treatments
(b) masses of photosythesising protists
(c) culture of phytoplanktons
(d) organic manures and fertilisers

2. Net pen culture was first used for:
(a) salmon
(b) rainbow trout
(c) herring
(d) European seabass

3. Mariculture refers to the cultivation of organisms in:
(a) mangrove
(b) freshwater
(c) seawater
(d) aquarium

4. Biofouling basically means:
(a) depletion of planktons
(b) replenishment of nutrient
(c) loss of water habitat
(d) accumulation of organisms

5. In shrimp farming, polyculture is preferred over monoculture because:
(a) it is easier to manage
(b) there is less risk of diseases
(c) the production is larger
(d) wastage of resources is reduced

6. The principal components of carapace appear to be:
(a) peptidoglycan and calcium phosphate
(b) cellulose and calcium oxalate
(c) calcium carbonate and chitin
(d) pectin and calcium phosphate

7. Salmon are well-known:
(a) potamodromous species
(b) diadromous species
(c) catadromous species
(d) anadromous species

8. Cartilaginous fishes (such as sharks and rays) are covered with:
(a) placoid scales
(b) ctenoid scales
(c) cycloid scales
(d) ganoid scales

9. Among others, one important aspect of hybridisation is to produce individuals which are:
(a) disease-resistant
(b) sterile
(c) better salinity-adapted
(d) fast reproducing

10. A cultivable fish described as a destructive invasive species is:
(a) *Chanos chanos* (milkfish)
(b) *Cyprinus carpio* (carp)
(c) *Hypophthalmichthys molitrix* (silver carp)
(d) *Labeo catla* (catla)

11. Yellow head virus of shrimp is transmitted by:
(a) mosquitos (b) mites
(c) birds (d) lice

12. Infectious salmon disease is a type of:
(a) bacterial disease (b) viral disease
(c) fungal disease (d) protozoal disease

13. A DNA vaccine is available for black tiger shrimp against infection with:
(a) Taura syndrome virus (b) yellow head virus
(c) hepatopancreatic parvovirus (d) white spot syndrome virus

14. A disease caused by the bacterium *Aeromonas salmonicida* is called:
(a) furunculosis (b) dracunculiasis
(c) dirofilariasis (d) cysticercosis

15. Whirling disease affects:
(a) liver (b) heart and blood vessels
(c) bones and nervous system (d) lung

16. A parasitic infection of the lung in humans and other mammals acquired from eating crabs and crayfish is:
(a) schistosomiasis (b) onchocerciasis
(c) hymenolepiasis (d) paragonimiasis

17. Cooperation between cleaner fish and their hosts is a prime example of:
(a) competition (b) mutualism
(c) parasitism (d) infectivity

18. The main cause of harmful algal bloom is:
(a) heavy rainfall (b) prolonged monsoon
(c) excessive competition (d) eutrophication

19. Yellow colouration due to yellow head virus comes from:
(a) the shell (b) hepatopancreas
(c) bile (d) eyes

20. Unlike mammalian red blood cells, RBC of fish can be infected by viruses because they contain:
(a) DNA (b) cyclins
(c) histones (d) viral receptors

21. The primary source of omega-3 fatty acids is:
(a) fish fat (b) algae
(c) zooplanktons (d) Gram-positive bacteria

22. Gynogenesis refers to a developmental process in which there is:
(a) formation of female phenotype (b) absence of gamete fusion
(c) sex change from maleness (d) overproduction of estrogens

23. A typical ratio of carbon, nitrogen, phosphorus of water bodies is:
(a) 1:2:1 (b) 205:56:1
(c) 5:3:1 (d) 106:16:1

24. Saltwater means that it has a pH:
(a) exactly 6 (b) below 7
(c) above 7 (d) exactly 5

25. Heterosis is a method for:
(a) enhancing quality of offspring
(b) inducing faster spawning
(c) increasing pituitary secretion
(d) preventing cannibalism

26. A sex-determining gene called DMY was discovered in:
(a) *Oncorhynchus mykiss* (rainbow trout)
(b) *Oryzias latipes* (Japanese rice fish or Medaka)
(c) *Oreochromis niloticus* (Nile tilapia)
(d) *Oncorhynchus tshawytscha* (Chinook salmon)

27. Introns are:
(a) specialised form of inbreeding
(b) transfer of marine species into freshwater
(c) DNA segments that can jump from one place to another
(d) non-coding regions of the genes

28. The most common target in DNA barcoding is:
(a) transcription factor
(b) cytochrome c oxidase I
(c) histone
(d) internal transcribed spacer

29. Okazaki fragments refer to:
(a) short DNA nucleotide sequences
(b) short amino acid chains after protein hydrolysis
(c) small RNA transcripts
(d) small fatty acyl chains due to â-oxidation

30. Hormones used for inducing ovulation and spawning of fishes are:
(a) growth hormones
(b) gonadotropins
(c) estrogens
(d) corticosteroids

31. The principal fat synthesis and storage site in fish is:
(a) cardiac muscle
(b) adipose tissue
(c) pancreas
(d) the liver

32. Brine is chemically composed of:
(a) magnesium sulphate in water
(b) calcium phosphate in water
(c) sodium chloride in water
(d) calcium chloride in water

33. Sourness of food and fish is due to metabolic production of:
(a) nitric acid
(b) hydrochloric acid
(c) sulphuric acid
(d) lactic acid

34. Ikejime is a method of:
(a) killing fish by puncturing the hindbrain
(b) canning fish using heat and chemical treatment
(c) vacuum packing fish
(d) preserving fish using organic preservatives

35. One of the most common freezing point depressant is:
(a) glycerol
(b) common salt
(c) slurry ice
(d) ethylene glycol

36. The major components of biofilms are:
(a) oligosaccharides and lipids
(b) nucleic acids and cholesterol
(c) proteins and polysaccharides
(d) peptidoglycans and sucrose

37. Aquaponics refers to a combined technique of aquaculture with:
(a) industrial waste management
(b) animal farming
(c) microbial culture
(d) plant cultivation

38. Flow-through system or raceways are vital components of:
(a) extensive aquaculture (b) intensive aquaculture
(c) semi-intensive aquaculture (d) semi-extensive aquaculture

39. Carbon sink can be defined as a condition in which there is:
(a) decrease carbon dioxide concentration
(b) reduced carbon dioxide production with respect to carbon intake
(c) increased carbon absorption to reduce carbon dioxide
(d) loss of carbon dioxide per hectare of water body

40. In the broadest sense, the idea of integrated multi-trophic aquaculture is to:
(a) minimize resources and manpower (b) increase fish quality
(c) maintain intensive food chain (d) decrease use of inorganic compounds

41. Ammonia is toxic to fish in the form of:
(a) hydrolised ammonia (b) ionized ammonia
(c) unionised ammonia (d) acidified ammonia

42. The best type of soil for aquaculture is:
(a) silt (b) loam
(c) peat (d) clay

43. By definition, a stenohaline species is:
(a) unable to survive in saline water (b) able to tolerate limited range of salinity
(c) able to tolerate high range of salinity (d) that prefers acidic water

44. Brackish water has a salinity of about:
(a) 0.5 to 30 ppt (b) 0.0 to 0.5 ppt
(c) 30 to 50 ppt (d) 50 to 75 ppt

45. *Desulfovibrio vulgaris* is a bacterium famous for its ability to convert:
(a) ammonia to nitrogen (b) nitrogen to nitrate
(c) sulfate to hydrogen sulfide (d) copper to copper sulfate

46. Selenium deficiency in fish is indicated by:
(a) egg reduction and bloody eyes (b) poor vision and pigmentation
(c) anorexia and rigor mortis (d) anaemia and anovulation

47. Nutrient compounds with the highest calorific value are:
(a) carbohydrates (b) lipids
(c) proteins (d) vitamins

48. Some essential amino acids are:
(a) leucine, arginine, lysine (b) glutamate, serine, tyrosine
(c) arginine, tryptophan, alanine (d) proline, glycine, aspartic acid

49. A major symptom of riboflavin deficiency in fish is:
(a) gill rotting (b) gasping
(c) diarrhoea (d) fin erosion

50. A fish that has low feed conversion ratio means that it has:
(a) high feed consumption with maximum output (b) low production
(c) efficient use of feed (d) optimum energy requirement

51. Cultivation of plants in water without the use of soil is called:
(a) aquaponics (b) hydroponics
(c) aeroponics (d) horticulture

52. Perlite is an efficient filter aid because it is:
(a) quite inert and highly insoluble
(b) lightweight and highly porous
(c) highly absorbent while being chemically stable
(d) selective against particles of different sizes

53. Chelation is a process of:
(a) mixing two or more metallic nutrients
(b) hydrolysis of metabolic enzymes
(c) bonding molecules to metal ions
(d) fusing two vitamin molecules

54. In integrated multi-trophic aquaculture, the higher trophic level is normally occupied by:
(a) carnivores
(b) planktons
(c) aquatic plants
(d) algae

55. Which of the following statements about gills is true?
(a) they are both respiratory and filter-feeding apparatuses
(b) they are exclusive respiratory organs
(c) they are both respiratory and excretory organs
(d) they are part of the digestive tract

56. The most abundant source of saxitoxin is:
(a) *Plasmodium* species
(b) *Alexandrium* species
(c) *Staphylococcus* species
(d) *Streptomyces* species

57. Carbon negative species or source implies that it is:
(a) not producing any carbon
(b) able to metabolise carbon compounds
(c) removing carbon more than it produces
(d) synthesising enzymes that degrade carbon dioxide

58. The most efficient method of microalgae culture is:
(a) open pond system
(b) air-lift methods
(c) closed reactor system
(d) batch method

59. Carrageenans produced from seaweed are chemically:
(a) carbohydrates
(b) sterols
(c) vitamin derivatives
(d) proteins

60. Mollusks should necessarily be reared at > pH 7 because at acidic condition:
(a) they cannot reproduce
(b) their shells would dissolve
(c) their oxygen uptake diminishes
(d) they loss body fluids

61. One of the characteristic features of the larval stage of fish is:
(a) formation of yolk sac
(b) appearance of lateral lines
(c) presence of fin rays
(d) gradual pigmentation

62. Saprolegniasis is a common fish egg infection that is due to:
(a) fungi
(b) bacteria
(c) protozoa
(d) virus

63. Squamation is a process concerning:
(a) development of fins
(b) branching of gills
(c) egg production
(d) scale formation

64. Metamorphosis in fish is mainly regulated by:
(a) adenocorticotropic hormone
(b) growth hormone
(c) thyroid hormones
(d) ecdysone

65. Ichthyoplankton is a collective name for the:
(a) eggs and larvae of fish
(b) mixture of fish and zooplanktons
(c) combination of aquatic microbes with fish
(d) conglomerate of plankton and fish

66. The function of a notochord is to act as:
(a) a swimming device
(b) an axial skeleton
(c) a divergence of neurons
(d) a respiratory accessory organ

67. Fecundity is related to:
(a) number of gametes
(b) quality of fingerlings
(c) survival of adults
(d) mating capacity

68. Chorulon® (hCG) is an FDA-approved drug in aquaculture for:
(a) helminthiasis
(b) water disinfections
(c) fungal diseases
(d) spawning

69. Estrogens in the feed can be detrimental to aquaculture production because they:
(a) inhibit yolk development
(b) are toxic to fries
(c) disrupt ovarian functions
(d) block neurosecretory products

70. Which of the following statements about luteinizing is false?
(a) it acts on Leydig cells
(b) it induces testosterone production
(c) it stimulates theca cells
(d) it promotes pituitary secretion

71. Cryo-preservation is done with:
(a) dry ice or liquid nitrogen
(b) solid carbon dioxide or freon
(c) tetrafluoroethane or dry ice
(d) chloroflurocarbon or freon

72. The first genetically modified animal approved for human consumption was:
(a) Nile tilapia
(b) rainbow trout
(c) Atlantic salmon
(d) common carp

73. Human lactoferrin gene is used in grass carp for:
(a) prevention of bacterial infection
(b) making fluorescence
(c) enhanced growth and body size
(d) increased omega 3-fatty acids

74. Agarose is useful for:
(a) treating aquaculture medium
(b) preventing algal blooms
(c) separating large biomolecules
(d) improving fish fecundity

75. An enzyme that can cut DNA into smaller fragments is:
(a) DNA helicase
(b) ligase
(c) restriction enzyme
(d) methyltransferase

76. Sensible heat flux of ocean is:
(a) stable rate of localised evaporation
(b) proportionate distribution of warm currents
(c) transfer of heat from warm to cold region
(d) balanced water temperature

77. Sonar is based on the measurement of:
(a) pulse
(b) depth or distance
(c) sound frequency
(d) echo

78. The signals in global positioning systems rely on:
(a) radio waves
(b) infrasound
(c) reflected sound waves
(d) interference

79. Which if the following statements about gyrocompass is false?
(a) it detects the true north pole
(b) it is not affected by Erath's magnetic field
(c) it is used in marine navigation
(d) it is influenced by ferromagnetic metals

80. Ultrasounds are defined as those that have frequency:
(a) from 20 kHz and above
(b) from 20 Hz and above
(c) from 2 Hz and above
(d) from 1 Hz and above

81. Lidar uses:
(a) ultrasound
(b) ultraviolet
(c) laser
(d) X-rays

82. Visible spectrum of light ranges from:
(a) 100 to 500 nm
(b) 250 to 800 nm
(c) 320 to 850 nm
(d) 380 to 700 nm

83. A good indicator of aquatic productivity is the concentration of:
(a) proteins
(b) chlorophyll
(c) essential nutrients
(d) vitamins

84. Bathymetry is the study of:
(a) fish migration
(b) physico-chemical properties of water
(c) depth of water bodies
(d) radiation level

85. Echolocation is found in:
(a) mysticetes
(b) odontocetes
(c) monotremes
(d) balaenids

86. Multibeam echosounder is used for:
(a) measuring ocean turbidity
(b) mapping seabed
(c) determining total suspended matter
(d) detecting fish schooling

87. Fishfinder is based on the principle of:
(a) reflected sound
(b) laser reflection
(c) light refraction
(d) optical dispersal

88. While detecting fish, sonar is used to target:
(a) the swimming pattern
(b) mobile behavior
(c) the swim bladder
(d) movements of the fins

89. NavIC used on boats and ships in India is developed by:
(a) Ministry of Ports, Shipping and Waterways
(b) Ministry of Fisheries
(c) Indian National Centre for Ocean Information Services
(d) Indian Space Research Organisation

90. A satellite-based device for fishermen in India that was launched in 2019 is called:
(a) EMISAT
(b) GEMINI
(c) Rohini
(d) APPLE

91. Green fluorescent protein used for making GloFish was originally obtained from:
(a) squid
(b) rotifer
(c) octopus
(d) jellyfish

92. The two most abundant fatty acids in nature are:
(a) stearic acid and glyceraldehydrate
(b) linoleic acid and linolenic acid
(c) palmitic acid and propanol
(d) myristic acid and gluten

93. Cod liver oil is traditionally used as a remedy for:

(a) rickets
(b) stomach cancer
(c) intestinal infection
(d) obesity

94. Isinglass is chemically:

(a) an acid
(b) a protein
(c) a phospholipid
(d) a carbohydrate

95. Milt refers to an organ or substance that contains:

(a) glycogen
(b) ovary
(c) lactose
(d) semen

96. An ideal icing involves use of ice to fish in a ratio of:

(a) 3:2
(b) 1:1
(c) 2:4
(d) 2:3

97. To adjust hardness and alkalinity of water, a chemical that can be used is:

(a) asbestos
(b) gypsum
(c) borax
(d) ash

98. By definition suspended solids are those particles typically larger than:

(a) 1.5 µm
(b) 1.0 µm
(c) 0.75 µm
(d) 0.45 µm

99. Carrying capacity of a specific water body is related to:

(a) the density of culturable organisms
(b) the gross weight of solid particles
(c) the level of dissolved oxygen
(d) the total abundance of planktons

100. The main purpose of hurdle technology is to:

(a) increase acidity of the preservative
(b) remove pathogens
(c) inhibit lactic acid production
(d) reduce gkycolysis

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