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අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2019 දෙසැම්බර්  
 கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2019 டிசெம்பர்  
**General Certificate of Education (Ord. Level) Examination, December 2019**

ජලජ ජීව සම්පත් තාක්ෂණවේදය I, II  
 நீருயிரினவளத் தொழினுட்பவியல் I, II  
**Aquatic Bioresources Technology I, II**

**06.12.2019 / 0830 – 1140**

පැය තුනයි  
 மூன்று மணித்தியாலம்  
**Three hours**

අමතර කියවීමේ කාලය - මිනිත්තු 10 යි  
 மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்  
**Additional Reading Time - 10 minutes**

Use **additional reading time** to go through the question paper, select the questions and decide on the questions that you give priority in answering.

### Aquatic Bioresources Technology I

#### Note:

- \* Answer **all** questions.
- \* In each of the questions from 1 to 40, pick one of the alternatives (1), (2), (3), (4), which is **correct** or **most appropriate**.
- \* Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.
- \* Further instructions are given on the back of the answer sheet. Follow them carefully.

1. The largest geographical area belongs to Sri Lanka is  
 (1) Land. (2) Offshore.  
 (3) Continental shelf. (4) Exclusive Economic Zone.
2. What is the main function that aquatic plants make?  
 (1) Increasing the aesthetic value of the environment.  
 (2) Increasing the purity of water.  
 (3) Supplying food and air required for the aquatic living beings.  
 (4) Enhancing the water quality.
3. Select the choice that includes only aquatic bio-resources.  
 (1) Fish, coral reefs, shrimps (2) Algae, Mangroves, lotus  
 (3) Shells, Crabs, Lobsters (4) Fish, reservoirs, seagrass
4. Select the correct statement regarding water bodies.  
 (1) Over 75% of the water in the earth is saltwater.  
 (2) Salinity of fresh water is less than 5 ppt.  
 (3) Only monocotyledons grow in marshes.  
 (4) River water flows into lagoon and form saltwater when mixing.
5. In a food chain of an aquatic ecosystem a secondary consumer would be  
 (1) algae. (2) snail. (3) fungi. (4) bird.
6. If the eutrophication continuously takes place in a fresh water pond, which of the following pictures depicts its final stage?



7. Which tool can be used to determine the plankton density of a pond?  
 (1) Secchi disc (2) pH meter (3) DO meter (4) Refractor meter

8. Select the correct statement regarding fish farming systems.

- (1) In the extensive method fish depend entirely on natural food.
- (2) In the semi-intensive method fish depend mainly on artificial feed.
- (3) In the intensive method fish depend 50% on natural food and 50% on artificial feed.
- (4) In the intensive method fish depend entirely on live food.

9. Consider the following statements.

A - None of the organisms in an ecosystem can live independently.

B - For the existence of an ecosystem only biotic-biotic interrelationships are adequate.

C - Human activities affect the sustainability of ecosystems.

Of the above statements the correct statement/statements regarding the biodiversity of aquatic ecosystems is/are

- (1) A only.
- (2) C only.
- (3) A and C only.
- (4) B and C only.

10. Select the correct statement related to fish physiological activities.

- (1) Blood circulates through the heart of fish which consists of three chambers.
- (2) Fish are having an open blood circulatory system.
- (3) Cartilage fish stay steady in water due to the function of the air bladder (swim bladder).
- (4) Fresh water fish produce large amount of dilute urine for osmotic regulation.

• The pictures below depict a few species of ornamental fish. Answer the questions 11, 12 and 13 based on the given pictures.



A



B



C



D

11. Which is the endemic ornamental fish species?

- (1) A
- (2) B
- (3) C
- (4) D

12. Which species **cannot** be grown as groups?

- (1) A
- (2) B
- (3) C
- (4) D

13. Fish species who gives/give live-birth by internal fertilization is/are

- (1) A only.
- (2) B only.
- (3) A and D only.
- (4) B and C only.

14. What is the fresh water fish species that largely contributes to the total fish production in Sri Lanka?

- (1) Tilapia
- (2) Mirigal
- (3) Rohu
- (4) Carp

15. What is the most adversely affecting process on the biodiversity of a pond?

- (1) Climatic changes
- (2) Population growth
- (3) Entrance of various living species to the pond
- (4) Addition of agrochemicals to the pond

16. The most suitable land for construction of a fish pond is a

- (1) flat land.
- (2) gently sloping land.
- (3) low-lying marshy land.
- (4) land of fast drainage.

17. Features of two fish species A and B are given in the table below.

Feature	Species A	Species B
Nature of gills	Not covered with an operculum	Covered with an operculum
Swimming pattern	Swim forward only	Swim forward as well as backward

According to the above features the fish species A and B respectively are

- (1) shark and skate.
- (2) skipjack and shark.
- (3) shark and skipjack.
- (4) skipjack and seerfish.

18. Which type of fishing craft is used commonly at present to catch fish in Sri Lanka?
- (1) Non-motorized traditional crafts
  - (2) Inboard engine day boats
  - (3) Inboard engine multi-day boats
  - (4) Outboard engine fiberglass boats

19. Select the correct statement related to growth of the mangrove plants.

- (1) Mangrove plants get uprooted due to effect of tidal waves.
- (2) Most mangrove plants grow well in sandy soil.
- (3) Mangrove plants grow well in saline water higher than 25ppt.
- (4) Mangrove plants grow well even in low oxygen conditions.

20. Consider the following statements.

A - Consist of soft body

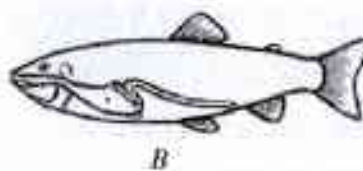
B - An Echinoderm

C - Culture widely in Southern coast of Sri Lanka

Of the above statements the correct statement/statements regarding sea-cucumber is/are

- (1) A only.
- (2) A and B only.
- (3) B and C only.
- (4) All A, B and C.

21. The digestive systems of two dissected fish species A and B are shown in the diagrams below.



According to the above two diagrams

- (1) A is a carnivore and B is a herbivore.
- (2) A is an omnivore and B is a carnivore.
- (3) A is a herbivore and B is a carnivore.
- (4) A is a herbivore and B is an omnivore.

22. What is the gas that affects for emitting of offensive odour from spoiled fish?

- (1) Ammonia
- (2) Carbon dioxide
- (3) Methane
- (4) Nitrous Oxide

23. What is the oldest method used in fish preservation?

- (1) Salting
- (2) Drying
- (3) Smoking
- (4) Making jaddi

24. Which gear would catch large amount of fish?

- (1) Hand line
- (2) Fish Kraal
- (3) Cast net
- (4) Ring net

25. What is the most suitable fishing gear could be used to catch small fish schools in the coastal sea?

- (1) Long line
- (2) Fishing rod
- (3) Beach seine
- (4) Ring net

26. What is an action to be taken to reduce spoilage immediately after catching shrimps?

- (1) cleaning by washing with warm water.
- (2) putting into plastic containers and sealing.
- (3) removing the heads.
- (4) mixing with sea sand.

27. Which parts of the fish are first to be removed after catching?

- (1) Internal organs and fins
- (2) Gills and fins
- (3) Fins and scales
- (4) Internal organs and gills

28. What is the main purpose of fish preservation?

- (1) Improving the taste
- (2) Lengthening shelf-life
- (3) Improving the nutritional value
- (4) Avoiding allergies.

29. Which of the following would be taken place in fish body during autolysis process?

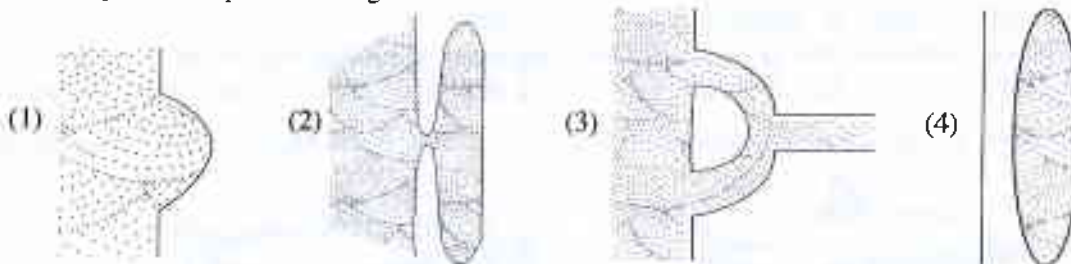
- (1) Breakdown of body protein
- (2) Formation of Acetic Acid
- (3) Rigor mortis
- (4) Discolouration of scales

30. Which fishery is still having a traditional management mechanism to ensure the sustainability of the fishery?

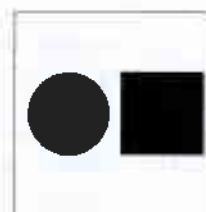
- (1) Pearl oyster fishing in Mannar coast
- (2) Chank fishery in South coast
- (3) Lobster fishery in the Jaffna Lagoon
- (4) Stake net fishery in the Negombo Lagoon

31. The fishing method which is prohibited to operate in Sri Lanka is  
 (1) Fishing by hand picking. (2) Fishing using push nets.  
 (3) Use of gill nets in inland reservoirs. (4) Operating ring nets in deep sea.
32. The following statements given below are made by a student regarding the objectives of adding additives in preparation of fish feed.  
 A - enhancing palatability of fish  
 B - storage of fish feed for long period  
 C - increasing feed conversion ratio  
 Which of the above statements are correct?  
 (1) A and B only. (2) A and C only. (3) B and C only. (4) All A, B and C.

33. Select the picture depicts the lagoon.



34. Sonar is used to  
 (1) identify fishing grounds. (2) identify the location of vessel.  
 (3) identify adverse weather conditions. (4) be aware of the sea boundaries.
35. What is the fish product developed using the principle of lowering the pH value?  
 (1) Maldive fish (2) Ambulthiyal  
 (3) Smoked fish (4) Fish dipped in concentrated salt solution
36. Under which institution is National Aquaculture Development Authority established?  
 (1) Department of Fisheries and Aquatic Resources  
 (2) Ministry of Fisheries and Aquatic Resources Development  
 (3) Ceylon Fisheries Harbour Corporation  
 (4) National Aquatic Resources Research and Development Agency
37. When fish is taken out from deep freezer and examined it was found that fish appeared dried up and shrunken. What would be the reason for this?  
 (1) Fish were not properly packed and sealed in the container.  
 (2) Fish had subjected to microbial infection.  
 (3) Fish and meat were stored together.  
 (4) Temperature of the deep freezer was not adequate enough.
38. The picture shows a flag displayed in a fishing boat. The background of the flag is orange. This boat is  
 (1) anchored.  
 (2) subjected to a distress situation.  
 (3) in close proximity to a site of fish abundance.  
 (4) ready to go to offshore for fishing.



39. Fish feed prepared by a student was found rancid after a few days. The main reason for that is when food preparation,  
 (1) adding excess quantity of soya bean meals.  
 (2) adding excess quantity of shark oil.  
 (3) not properly mixing of ingredients.  
 (4) not using clean equipment and containers.
40. A person wanted 7kg of tiger shrimps. For that, approximately how many mature shrimps should he take?  
 (1) 70 (2) 100 (3) 140 (4) 200

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 கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2019 டிசெம்பர்  
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நீருயிரினவளத் தொழினுட்பவியல்	I, II
<b>Aquatic Bioresources Technology</b>	<b>I, II</b>

### **Aquatic Bioresources Technology II**

**\* Answer five questions only, selecting the first question and four others.**

- (A) Marine fisheries industry in Sri Lanka conducts in coastal sea, exclusive economic zone and in the deep sea. Fishing in the deep sea should be further developed but the technology and the equipment required for that are insufficient.

Brackish water resources are available too for further development of shrimp farming. However, it is difficult to maintain the sustainable shrimp farming due to disease outbreak conditions.

  - According to the information above
    - State **two** strengths in the fisheries industry.
    - State **two** weaknesses in the fisheries industry.
  - Draw a sketch of the map of Sri Lanka and mark the sea boundaries stated below.
    - Coastal sea
    - Exclusive economic zone
    - Deep sea
  - State a fishing method in coastal sea boundary except open-access fishing method.
  - State **two** fish species that can be cultured in brackish water.
  - What is the fishing vessel used in deep sea fishing?
    - State **three** facilities that should be in the vessel mentioned in (a) above.
  - State **two** culture structures that could be used in shrimp farming.

(B) 'Fish balls' is a value added fish product.

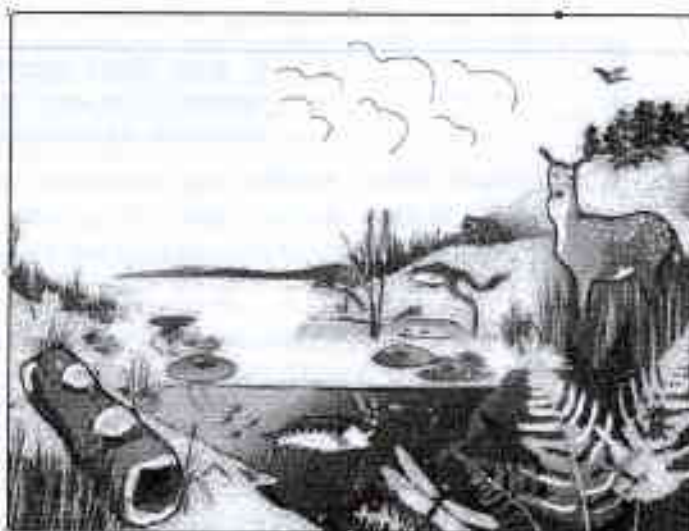
  - Illustrate the process of fish ball production, using a flow-chart.
  - In the process of fish ball production,
    - state a purpose of adding ice cubes,
    - state a purpose of boiling.
  - How would you identify the quality of prepared fish balls?
  - State an additive that can be used in keeping the fish balls for long.
- The maintenance of the water quality is an essential task for the success of fresh water aquaculture which is done under intensive method.

  - State **four** water sources that can be used to supply water to a fresh water aquaculture.
  - State **four** factors that affect the water quality.
  - State **two** disadvantages of fish farming using intensive method.
  - State **four** parameters that can be used to determine the water quality.
    - Describe the way of measuring one of the parameters you have mentioned in (a) above.

[see page six

3. This picture depicts an ecosystem,

- (i) Name the ecosystem shown in the picture.
- (ii) (a) Name **two** biotic factors,  
(b) Name **two** abiotic factors in this ecosystem.
- (iii) Write a food chain that can exist in this ecosystem.
- (iv) Describe **two** measures that can be taken to conserve this ecosystem.



4. Ice manufacturing is important in fisheries industry.

- (i) (a) What is the main purpose of using ice in the fisheries industry?  
(b) What is the main factor affecting the quality of the manufactured ice?
- (ii) (a) State **two** factors that decide the amount of ice needed for fishing vessel.  
(b) State **two** types of ice used in fisheries industry.
- (iii) Describe the correct way of staking fish and ice in a box.

5. Aquatic plants can be propagated from stem cuttings.

- (i) (a) State **two** aquatic plants that can be propagated from stem cuttings.  
(b) In addition to stem cuttings, state **two** other plant protergules used in aquatic plant propagation.
- (ii) State **four** benefits of aquatic plants.
- (iii) Describe **two** negative impacts of aquatic plants.

6. Fish production of inland reservoirs in Sri Lanka for three years is shown in the table below.

Year	2015	2016	2017
Fish production (metric tons)	67 300	73 930	81 870

- (i) (a) What is the main reason for increasing fish production with the time in the inland reservoirs?  
(b) State **two** districts where aquaculture is mainly undertaking in inland reservoirs.
- (ii) (a) Based on the feeding pattern, categorize the inland food fish.  
(b) State **two** kinds of live food that can be given to fry before introducing to reservoirs.
- (iii) (a) Mention **two** characteristics that should be in fresh water food fish, used in farming.  
(b) Explain the importance of those characteristics.

7. Different fishing gears and vessels are used in fisheries industry.

- (i) State a traditional fishing gear and a traditional fishing craft that are used in catching fish in each of the water bodies given below.
  - (a) Fresh water reservoir
  - (b) Lagoon
  - (c) Offshore
- (ii) Describe **two** importance of sustainable use of aquatic bio-resources.
- (iii) Describe the correct way of handling the harvested fish till sending to the market.