Board Exam Desk

Fisheries Reviewer

Fisheries Licensure Examination | PRC | 120 original questions

2026 Edition | Updated November 2026

Original board-style practice questions with an answer key.

Practice questions

Aquaculture

1. A 2,000 m2 tilapia pond is stocked at 8 fingerlings per square metre. If survival at harvest is 75%, how many fish are expected at harvest?

A. 12,000 fish
B. 16,000 fish
C. 10,667 fish
D. 4,000 fish

6. A cage stocked with 100 kg of milkfish yields 1,000 kg at harvest after 1,350 kg of formulated feed is consumed. What is the feed conversion ratio?

A. 1.50
B. 1.35
C. 0.67
D. 1.45

11. A rectangular grow-out pond measures 50 m by 40 m with an average water depth of 1.2 m. What is its water volume?

A. 2,400 m3
B. 2,000 m3
C. 240 m3
D. 1,200 m3

16. Soil analysis recommends 1,500 kg of agricultural lime per hectare for an acidic pond bottom. How much lime is needed for a 4,000 m2 pond?

A. 600 kg
B. 375 kg
C. 6,000 kg
D. 150 kg

21. A shrimp farmer stocked 20,000 postlarvae and counted 15,400 shrimp at harvest. What was the survival rate?

A. 77%
B. 23%
C. 70%
D. 84%

26. Fingerlings grew from an average of 5 g to 125 g in 100 days. What is the specific growth rate (SGR) in percent body weight per day?

A. 1.20% per day
B. 1.40% per day
C. 3.22% per day
D. 2.40% per day

31. A pond holds 10,000 tilapia averaging 50 g each. At a feeding rate of 3% of body weight per day, how much feed should be given daily?

A. 15 kg
B. 1.5 kg
C. 150 kg
D. 30 kg

36. Which species is the traditional mainstay of brackishwater pond culture in the Philippines because of its wide salinity tolerance and herbivorous feeding habit?

A. Chanos chanos
B. Clarias macrocephalus
C. Channa striata
D. Anabas testudineus

41. A hatchery wants an all-male tilapia population for faster, more uniform growth. Which practice is most commonly used?

A. Stocking fry at very low densities
B. Raising fry at reduced water salinity
C. Feeding fry only live zooplankton
D. Feeding fry with 17-alpha-methyltestosterone feed

46. Fish in a pond with a heavy phytoplankton bloom are seen gasping at the surface just before sunrise. What is the most likely cause?

A. Midday supersaturation of dissolved oxygen
B. Sudden rise in water salinity
C. Night respiration depleting dissolved oxygen
D. Excess calcium carbonate in the water

51. In milkfish pond culture, what is lablab?

A. A filamentous green alga floating at the surface
B. A rooted aquatic plant used for shade
C. A benthic mat of blue-green algae and diatoms
D. A floating fern used as green manure

56. Under which pond condition does the toxic un-ionized fraction of total ammonia increase the most?

A. High pH and high temperature
B. Low pH and low temperature
C. Low pH and high temperature
D. High pH and low temperature

61. Kappaphycus alvarezii is farmed widely in Philippine coastal waters mainly as a source of which product?

A. Agar
B. Alginate
C. Carrageenan
D. Chitosan

66. A hatchery injects carp broodstock with pituitary extract a few hours before the expected spawning. What is the purpose of this practice?

A. To speed up early juvenile growth
B. To induce final oocyte maturation and spawning
C. To prevent bacterial infection of eggs
D. To reverse the sex of the broodstock

71. What is the correct order of larval stages of the giant tiger prawn, Penaeus monodon?

A. Zoea, nauplius, mysis, postlarva
B. Nauplius, mysis, zoea, postlarva
C. Nauplius, zoea, mysis, postlarva
D. Mysis, zoea, nauplius, postlarva

76. In a biofloc shrimp system the operator adds molasses to the water daily. What is the main purpose?

A. To lower salinity for faster molting
B. To supply calcium for shell hardening
C. To raise the C:N ratio so heterotrophic bacteria take up ammonia
D. To kill filamentous algae in the pond

81. A pond holding 3,000 m3 of water needs a daily water exchange of 10%. How much water must be replaced each day?

A. 30 m3
B. 3,000 m3
C. 330 m3
D. 300 m3

86. A spawning hormone is administered at 0.5 mL per kg body weight. How much should be injected into a female broodfish weighing 2.4 kg?

A. 4.8 mL
B. 0.21 mL
C. 2.9 mL
D. 1.2 mL

91. Silver carp, bighead carp and common carp are stocked together in one pond. What is the main advantage of this polyculture?

A. All three species feed on the same food
B. The species interbreed to give hybrid vigor
C. Each species uses a different food niche
D. It removes the need to test water quality

96. A pond requires 10 kg of P_2O_5 per hectare per application. Using 16-20-0 fertilizer, how much fertilizer is needed for a 0.5 ha pond?

A. 50 kg
B. 25 kg
C. 31 kg
D. 10 kg

101. When choosing a site for green mussel (Perna viridis) farming, which water characteristic is most important for good growth?

A. Abundant plankton in moderately flowing water
B. Very clear water with low plankton
C. Stagnant water with heavy siltation
D. Freshwater with no tidal influence

106. A fertilized pond shows a Secchi disk visibility of only 12 cm due to a dense green bloom. What should the farmer do?

A. Add more fertilizer to sustain the bloom
B. Stop fertilizing and exchange some water
C. Increase feeding to use the plankton
D. Raise the stocking density at once

111. A farmer targets 3,000 kg of milkfish per hectare at an average harvest weight of 250 g with 80% expected survival. How many fingerlings should be stocked per hectare?

A. 12,000
B. 9,600
C. 15,000
D. 18,750

116. Why are rotifers such as Brachionus commonly used as the first live food for many marine fish larvae?

A. They fit the small mouth gape of first-feeding larvae
B. They are larger than newly hatched Artemia
C. They supply all fatty acids without enrichment
D. They settle quickly to the tank bottom

Capture Fisheries

2. Which feature distinguishes a purse seine from other surrounding nets?

A. Otter boards that spread the net mouth
B. Baited hooks on branch lines
C. A cod end dragged along the seabed
D. A purse line that closes the net bottom

7. How are fish typically retained in a gill net?

A. They are lured into a funnel and trapped
B. They become enmeshed behind the gill covers
C. They are hooked through the upper jaw
D. They are herded into a bag by sweeplines

12. In an otter trawl, what is the main function of the otter boards?

A. To lift the cod end off the seabed
B. To spread the net mouth horizontally
C. To keep the headline from floating up
D. To close the net at the end of the tow

17. In a tuna longline, what are the short lines that connect each hook to the main line called?

A. Float lines
B. Branch lines
C. Warp lines
D. Purse lines

22. A net panel 100 m long when fully stretched is mounted onto a 50 m float line. What is the hanging ratio?

A. 2.00
B. 0.50
C. 0.33
D. 0.67

27. The bar length of a diamond mesh, measured from knot center to knot center, is 20 mm. What is its stretched mesh size?

A. 20 mm
B. 40 mm
C. 10 mm
D. 80 mm

32. Fishers in Philippine offshore waters anchor bamboo rafts with palm fronds hanging below. What is the purpose of these payao?

A. To attract and aggregate pelagic fish
B. To mark the boundary of municipal waters
C. To collect seaweed spores for farming
D. To serve as nesting sites for demersal fish

37. Squid and small pelagic fish are often caught at night with strong lamps on the boat. What behavior makes this method work?

A. Strong avoidance of artificial light
B. Daytime spawning near the surface
C. Attraction to engine vibration
D. Positive phototaxis of the target species

42. A shrimp trawl is fitted with a grid that guides large animals out through an opening in the net. What is this device called?

A. Fish aggregating device
B. Turtle excluder device
C. Otter board assembly
D. Cod end liner

47. A trawler caught 3,600 kg of fish over 12 fishing days, making 3 hauls per day. What is the catch per unit effort per haul?

A. 100 kg per haul
B. 300 kg per haul
C. 33 kg per haul
D. 1,200 kg per haul

52. An echo sounder pulse returns 0.08 s after transmission. If sound travels at 1,500 m/s in seawater, how deep is the bottom?

A. 60 m
B. 120 m
C. 30 m
D. 18.75 m

57. A fishing vessel cruises at 10 knots for 3 hours. About how far does it travel in kilometres?

A. 30.0 km
B. 55.6 km
C. 48.3 km
D. 16.2 km

62. A gill net lost on a reef continues to entangle fish for months. What is this problem called?

A. Pulse fishing
B. Bycatch discarding
C. Ghost fishing
D. High-grading

67. In pole-and-line fishing for skipjack tuna, why is live bait thrown into the water?

A. To keep the school feeding near the boat
B. To disperse the school away from the boat
C. To lower the water temperature
D. To mark the fishing ground for others

72. What is the main difference between a bottom-set gill net and a drift gill net?

A. One uses hooks; the other uses netting
B. One is anchored to the seabed; the other floats freely
C. One is towed by a boat; the other is fixed
D. One closes with a purse line; the other does not

77. A basnig is commonly operated at night in the Philippines. Which gear type does it belong to?

A. Bottom trawl towed by two boats
B. Drift longline set for tuna
C. Boat-operated lift net used with lights
D. Stationary fish corral near shore

82. In a fish corral, what is the function of the long leader fence extending from shore?

A. To guide fish toward the trap chambers
B. To anchor the corral against currents
C. To keep predators away from the catch
D. To mark the corral for navigation

87. A skipper fishing in 40 m of water uses a warp-to-depth ratio of 3:1. How much warp should be paid out?

A. 43 m
B. 13 m
C. 120 m
D. 160 m

92. A boat engine burns 20 L of fuel per hour during a 15-hour trip that lands 1,200 kg of fish. What is the fuel use per kilogram of fish?

A. 4.0 L/kg
B. 0.25 L/kg
C. 0.017 L/kg
D. 0.80 L/kg

97. A trawl cod end has a 60 mm mesh, and the selection factor for the target species is 3.5. What is the estimated 50% retention length (L50)?

A. 17.1 cm
B. 21.0 cm
C. 6.35 cm
D. 24.5 cm

102. Which gear consists of baited or lured lines towed behind a moving boat, often to catch tuna and Spanish mackerel?

A. Bottom set line
B. Handline jig
C. Fish pot
D. Trolling line

107. How many metres are in one international nautical mile, the distance unit used in fishing navigation?

A. 1,609 m
B. 1,000 m
C. 1,500 m
D. 1,852 m

112. A fisheries officer wants a gear that targets one size class and lets smaller fish escape. Which gear property is mainly adjusted?

A. Color of the floats
B. Mesh size of the netting
C. Length of the tow rope
D. Number of crew members

117. A seine is set from shore in a semicircle and hauled back onto the beach by ropes at both wings. What is this gear called?

A. Purse seine
B. Bottom trawl
C. Beach seine
D. Lift net

Fish Processing Technology

3. What is the usual order of post-mortem changes in fish held without preservation?

A. Rigor mortis, pre-rigor, bacterial spoilage, autolysis
B. Autolysis, pre-rigor, rigor mortis, bacterial spoilage
C. Bacterial spoilage, rigor mortis, pre-rigor, autolysis
D. Pre-rigor, rigor mortis, autolysis, bacterial spoilage

8. About how much ice must melt to chill 100 kg of fish from 28 C to 0 C? Take the specific heat of fish as 3.6 kJ/kg-K and the latent heat of ice as 334 kJ/kg.

A. 10.8 kg
B. 30.2 kg
C. 92.8 kg
D. 8.4 kg

13. A processor dissolves 25 kg of salt in 75 kg of water to make brine. What is the salt concentration in percent by weight?

A. 33%
B. 75%
C. 20%
D. 25%

18. Drying preserves fish mainly because it does which of the following?

A. Raises the pH to a highly alkaline level
B. Destroys all bacterial spores in the flesh
C. Converts the fish protein into fat
D. Lowers water activity below what microbes need

23. Several diners developed flushing, headache and a peppery taste after eating tuna that sat unchilled for hours. What is the most likely cause?

A. Paralytic shellfish poisoning
B. Scombroid poisoning from histamine
C. Ciguatera from reef algae toxin
D. Botulism from improper canning

28. During smoking of fish, which smoke components contribute most to flavor and act as antioxidants?

A. Carbon monoxide
B. Water vapor
C. Phenols
D. Nitrogen gas

33. Low-acid canned fish must be retorted to commercial sterility mainly to destroy which organism?

A. Lactobacillus plantarum cells
B. Saccharomyces cerevisiae yeast
C. Aspergillus niger mold
D. Clostridium botulinum spores

38. Patis is a clear liquid obtained after months of mixing fish with salt. What mainly breaks down the fish proteins during this process?

A. Added lactic acid bacteria and sugar
B. High-temperature cooking of the mixture
C. Smoke compounds from a smokehouse
D. Enzymes in the fish and halophilic microbes

43. In surimi production, why are sugar and sorbitol mixed into the washed fish mince before freezing?

A. They increase the fat content of the product
B. They serve as the main gelling starch
C. They act as cryoprotectants for myofibrillar protein
D. They give surimi its red color

48. A batch of 30 kg of whole fish produces 18 kg of dressed fish. What is the dressing yield?

A. 60%
B. 40%
C. 167%
D. 54%

53. Fresh fish weighing 100 kg with 78% moisture is dried to a final moisture content of 20%. What is the weight of the dried product?

A. 22.0 kg
B. 42.0 kg
C. 80.0 kg
D. 27.5 kg

58. Which chemical index rises steadily as fish spoil and is widely used to judge freshness?

A. Total dietary fiber
B. Crude ash content
C. Ascorbic acid content
D. Total volatile basic nitrogen

63. Why does quick freezing usually give better fish quality than slow freezing?

A. It forms large ice crystals that hold moisture
B. It raises the storage temperature needed
C. It removes all bacteria from the fish
D. It forms small ice crystals that cause less drip loss

68. Frozen fish blocks are dipped in cold water to form a thin ice coat before storage. What is the main purpose of this glaze?

A. To raise the storage temperature
B. To add salt to the fish surface
C. To reduce dehydration and fat oxidation
D. To speed up thawing later

73. Grayish, dry, spongy patches appear on poorly wrapped fish stored in a freezer. What causes this freezer burn?

A. Growth of molds at freezer temperature
B. Too much salt added before freezing
C. Sublimation of ice from the fish surface
D. Bacterial action producing histamine

78. What is the first principle of a HACCP system for a fish processing plant?

A. Establish verification procedures
B. Set up record-keeping
C. Establish corrective actions
D. Conduct a hazard analysis

83. In a sardine canning line, which step is usually treated as the critical control point for destroying pathogens?

A. Washing the raw fish
B. Labeling the finished cans
C. Thermal processing in the retort
D. Storing the empty cans

88. Fatty fish such as mackerel develop rancid odors during frozen storage. Which practice best slows this problem?

A. Vacuum packing to exclude oxygen
B. Storing in clear bags under light
C. Raising the storage temperature
D. Adding water before packing

93. An inspector checks whole fish at a landing site. Which sign indicates the fish is fresh?

A. Brown gills and sunken, cloudy eyes
B. Bright red gills and clear, bulging eyes
C. Soft flesh that stays dented when pressed
D. Strong ammonia odor from the belly

98. Why is slurry ice often preferred over flake ice for chilling small fish on board?

A. It keeps fish warmer to prevent rigor
B. It contains no water so fish stay dry
C. It needs no refrigeration to produce
D. It surrounds the fish closely and cools them faster

103. Which seaweed genus cultivated in Philippine ponds is the main raw material for agar?

A. Kappaphycus
B. Sargassum
C. Caulerpa
D. Gracilaria

108. In which salting method is fish layered with dry salt and the brine that forms is allowed to drain away?

A. Pickle salting
B. Brine injection
C. Wet curing in vats
D. Kench salting

113. A blast freezer handles 500 kg of fish per batch, and each batch takes 4 hours. If it runs 20 hours a day, what is its daily freezing capacity?

A. 2,000 kg
B. 2,500 kg
C. 10,000 kg
D. 125 kg

118. Why should fish be gutted soon after capture when they will be stored for several days?

A. Gutting raises the fat content of the flesh
B. Gut enzymes and bacteria quickly attack the belly wall
C. The gut adds weight that lowers selling price only
D. Gutting stops rigor mortis from occurring

Fisheries Biology and Aquatic Ecology

4. In the length-weight relationship W = aL^b, what does a b value of exactly 3 indicate?

A. Negative allometric growth
B. Positive allometric growth
C. Isometric growth
D. Zero growth in weight

9. A fish is 25 cm long and weighs 250 g. What is its Fulton condition factor, K = 100W/L^3?

A. 0.16
B. 10.0
C. 4.00
D. 1.60

14. In the von Bertalanffy growth equation, what does the parameter L-infinity represent?

A. The length of the fish at hatching
B. The length at first sexual maturity
C. The average maximum length the fish would reach
D. The yearly increase in length

19. A stock has total mortality Z = 1.2 per year and natural mortality M = 0.4 per year. What is the exploitation rate E = F/Z?

A. 0.67
B. 0.33
C. 0.50
D. 0.80

24. A cohort experiences a constant total mortality rate Z = 0.5 per year. What fraction of the cohort survives after 2 years?

A. 0.368
B. 0.135
C. 0.250
D. 0.607

29. A female fish weighs 900 g and its ovaries weigh 45 g. What is its gonadosomatic index?

A. 20%
B. 5.0%
C. 4.8%
D. 0.05%

34. In a small lake, 200 tilapia are tagged and released. Later a sample of 150 fish contains 30 tagged fish. Using the Lincoln-Petersen method, what is the estimated population?

A. 6,000 fish
B. 1,000 fish
C. 350 fish
D. 750 fish

39. Heavy runoff of fertilizers into a lake leads to dense algal blooms and later fish kills. What process does this describe?

A. Eutrophication
B. Bioaccumulation
C. Thermal stratification
D. Salinization

44. In a deep tropical lake that becomes thermally stratified, what is the thermocline?

A. The layer where temperature drops sharply with depth
B. The warm, well-mixed surface layer
C. The cold, dark bottom layer
D. The shallow zone where rooted plants grow

49. Producers in a coastal ecosystem fix 50,000 kcal of energy. Assuming 10% transfer efficiency between levels, how much energy reaches secondary carnivores?

A. 50 kcal
B. 500 kcal
C. 5,000 kcal
D. 5 kcal

54. Red tide events in the Philippines have most often been caused by Pyrodinium bahamense var. compressum. What illness is linked to eating shellfish from these waters?

A. Scombroid fish poisoning
B. Ciguatera fish poisoning
C. Paralytic shellfish poisoning
D. Amnesic shellfish poisoning

59. Why are mangrove forests considered important to coastal fisheries?

A. They raise the salinity of nearby waters
B. They serve as nursery grounds for many juveniles
C. They are the main spawning site of tuna
D. They reduce the plankton supply of bays

64. Divers observe large areas of white coral after a period of unusually warm seawater. What has happened to these corals?

A. They have been overgrown by calcareous algae
B. They have been killed by blast fishing
C. They have expelled their symbiotic zooxanthellae
D. They have entered their spawning season

69. Freshwater eels (Anguilla) grow in rivers and migrate to the ocean to spawn. How is this life history described?

A. Anadromous
B. Potamodromous
C. Oceanodromous
D. Catadromous

74. Which hard structure in the fish inner ear is most often used to count daily or annual growth rings for age determination?

A. Swim bladder
B. Lateral line
C. Gill raker
D. Otolith

79. How does a marine bony fish keep its body fluids from losing water to the surrounding sea?

A. It drinks seawater and excretes salt through gill cells
B. It absorbs salt and produces large volumes of dilute urine
C. It retains urea to match seawater osmolarity
D. It stops drinking and absorbs water through the skin

84. Water flows over fish gill lamellae in the opposite direction to blood flow. What advantage does this arrangement give?

A. It maximizes oxygen uptake across the lamellae
B. It slows the heart rate of the fish
C. It prevents salt loss through the gills
D. It allows the fish to breathe air

89. Which group of phytoplankton is characterized by cell walls (frustules) made of silica?

A. Diatoms
B. Dinoflagellates
C. Cyanobacteria
D. Euglenoids

94. A 0.5 g subsample of an ovary contains 400 eggs. If the whole ovary weighs 30 g, what is the estimated fecundity?

A. 24,000 eggs
B. 12,000 eggs
C. 6,000 eggs
D. 60,000 eggs

99. Many groupers (Epinephelus) mature first as females and later change into males. What is this reproductive pattern called?

A. Protandrous hermaphroditism
B. Protogynous hermaphroditism
C. Gonochorism
D. Simultaneous hermaphroditism

104. A Schaefer surplus production model gives an intrinsic growth rate r = 0.6 per year and a carrying capacity K = 20,000 t. What is the maximum sustainable yield?

A. 6,000 t
B. 12,000 t
C. 10,000 t
D. 3,000 t

109. How do seagrasses differ from seaweeds?

A. Seagrasses are flowering plants with true roots
B. Seagrasses are red algae without roots
C. Seaweeds produce flowers and seeds
D. Seaweeds have vascular tissue and true leaves

114. A river downstream of a food factory shows a sharp rise in biochemical oxygen demand. What does this mainly indicate?

A. A high concentration of dissolved oxygen
B. An increase in water clarity
C. A heavy load of decomposable organic matter
D. A drop in water temperature

119. To which family does the milkfish, Chanos chanos, belong?

A. Cichlidae
B. Mugilidae
C. Siganidae
D. Chanidae

Fisheries Management, Extension and Laws

5. Under RA 8550 as amended, how far from the coastline do municipal waters extend, where no special boundary conditions apply?

A. 15 kilometres
B. 10 kilometres
C. 12 nautical miles
D. 200 nautical miles

10. Under the Philippine Fisheries Code, municipal fishing refers to fishing in municipal waters using vessels of what maximum size, or no vessel at all?

A. 3 gross tons
B. 5 gross tons
C. 10 gross tons
D. 20 gross tons

15. A fishing company operates a 100 gross ton vessel. Under the Fisheries Code, how is its commercial fishing classified?

A. Small-scale commercial fishing
B. Medium-scale commercial fishing
C. Large-scale commercial fishing
D. Municipal fishing

20. Which law amended the Philippine Fisheries Code of 1998 mainly to deter illegal, unreported and unregulated fishing?

A. Republic Act No. 7160
B. Republic Act No. 9147
C. Republic Act No. 8435
D. Republic Act No. 10654

25. Which bodies created under the Fisheries Code let fisherfolk and other stakeholders take part in planning fisheries policies at local and national levels?

A. Barangay Peacekeeping Action Teams
B. Provincial Development Councils only
C. Fisheries and Aquatic Resources Management Councils
D. Cooperative Development Authorities

30. A domestic tilapia industry claims that a surge of imported frozen fish is causing it serious injury. Which law provides for temporary safeguard measures on such imports?

A. Republic Act No. 8550
B. Republic Act No. 10654
C. Republic Act No. 8800
D. Republic Act No. 9003

35. Why do fisheries authorities declare a closed season for a species in a particular area?

A. To raise market prices for fish traders
B. To allow commercial vessels sole access
C. To give time for boat registration
D. To protect stocks during spawning or recruitment

40. Fishers are caught squirting sodium cyanide into coral crevices to stun aquarium fish. How is this act treated under the Fisheries Code?

A. Allowed if fish are sold alive
B. Allowed with a gratuitous permit
C. Prohibited use of noxious or poisonous substances
D. A minor violation of mesh-size rules

45. An investor plans to clear a stand of mangroves to build new fishponds. How does the Fisheries Code treat this activity?

A. It is allowed in municipal waters only
B. It is allowed if the ponds are under 5 ha
C. It is allowed if the fry are bought locally
D. Converting mangroves into fishponds is prohibited

50. A fish farmer wants to develop public land suitable for fishponds. Under which instrument is such land usually awarded by the government?

A. Certificate of Ancestral Domain Title
B. Free Patent Application
C. Forest Land Grazing Agreement
D. Fishpond Lease Agreement

55. Fish catches in waters next to a well-enforced no-take marine reserve improve over several years. What is this effect called?

A. Bycatch
B. Spillover
C. Overcapacity
D. High-grading

60. Compared with fishing effort at maximum sustainable yield, the effort that gives maximum economic yield is usually what?

A. Higher than the effort at MSY
B. Equal to the effort at MSY
C. Twice the effort at MSY
D. Lower than the effort at MSY

65. In an open-access fishery with no limits on entry, what tends to happen to economic rent over time?

A. It is dissipated as more boats enter
B. It rises steadily as the stock grows
C. It stays fixed regardless of effort
D. It is collected fully by the government

70. A provincial plan considers fish stocks, habitats, people's livelihoods and governance together rather than one species at a time. Which framework is this?

A. Single-species quota management
B. Maximum effort development strategy
C. Ecosystem approach to fisheries management
D. Open-access fisheries policy

75. A bay is managed jointly by the municipal government and organized fisherfolk who share rules and enforcement duties. What is this arrangement called?

A. Privatization
B. Co-management
C. Open access
D. Central command management

80. In the diffusion of innovations model, which group is the first to try a new aquaculture technology?

A. Early majority
B. Innovators
C. Laggards
D. Late majority

85. An extension worker sets up a farmer's pond using a new feeding scheme so neighbors can see the harvest. What extension method is this?

A. Mass media campaign
B. Office consultation
C. Result demonstration
D. Circular letter

90. A hatchery project has a present value of benefits of PHP 1.8 million and a present value of costs of PHP 1.5 million. What is its benefit-cost ratio?

A. 0.83
B. 0.30
C. 2.70
D. 1.20

95. A tilapia grower spends a total of PHP 450,000 to produce 3,000 kg of fish. What is the break-even price per kilogram?

A. PHP 135
B. PHP 150
C. PHP 1,500
D. PHP 15

100. A milkfish operation earns PHP 600,000 in sales and incurs PHP 480,000 in total costs. What is its return on investment based on total costs?

A. 20%
B. 80%
C. 25%
D. 125%

105. A cage farm requires an investment of PHP 900,000 and generates net cash inflow of PHP 300,000 per year. What is the simple payback period?

A. 0.33 year
B. 4 years
C. 3 years
D. 2 years

110. Which monitoring, control and surveillance tool reports the position of commercial fishing vessels to authorities in near real time?

A. Catch documentation logbook
B. Vessel monitoring system
C. Port sampling survey
D. Gear marking tag

115. Which national government agency, attached to the Department of Agriculture, is primarily responsible for fisheries development and management?

A. Environmental Management Bureau
B. Philippine Coast Guard
C. Bureau of Fisheries and Aquatic Resources
D. National Irrigation Administration

120. Who has primary jurisdiction over the management and registration of municipal fisherfolk and activities within municipal waters?

A. The Department of Foreign Affairs
B. The municipal or city government
C. The Philippine Ports Authority
D. The Department of Energy

Answer key

Fisheries

1. A. 12,000 fish

Stocked = 2,000 x 8 = 16,000 fingerlings; harvested = 16,000 x 0.75 = 12,000 fish.

2. D. A purse line that closes the net bottom

Hauling the purse line through rings closes the bottom of the encircling wall of netting, trapping the school.

3. D. Pre-rigor, rigor mortis, autolysis, bacterial spoilage

After death fish pass through pre-rigor, then rigor mortis; after rigor resolves, enzymes (autolysis) and bacteria break down the flesh.

4. C. Isometric growth

When b = 3 the fish keeps the same body shape as it grows; values above or below 3 indicate allometric growth.

5. A. 15 kilometres

The Fisheries Code defines municipal waters as marine waters up to 15 km from the coastline, within the municipality's jurisdiction.

6. A. 1.50

FCR = feed given / biomass gained = 1,350 / (1,000 - 100) = 1,350 / 900 = 1.50.

7. B. They become enmeshed behind the gill covers

Fish swim into the meshes and are caught behind the opercula, so mesh size strongly determines the sizes caught.

8. B. 30.2 kg

Heat removed = 100 x 3.6 x 28 = 10,080 kJ; ice = 10,080 / 334 = 30.2 kg.

9. D. 1.60

K = 100 x 250 / 25^3 = 25,000 / 15,625 = 1.60.

10. A. 3 gross tons

RA 8550 defines municipal fishing as fishing within municipal waters using vessels of 3 gross tons or less, or without vessels.

11. A. 2,400 m3

Volume = 50 m x 40 m x 1.2 m = 2,400 m3.

12. B. To spread the net mouth horizontally

Otter boards act as hydrofoils that pull outward during towing, keeping the trawl mouth open horizontally.

13. D. 25%

Concentration = 25 / (25 + 75) x 100 = 25% w/w.

14. C. The average maximum length the fish would reach

L-infinity is the asymptotic length that average fish approach if they lived and grew indefinitely.

15. B. Medium-scale commercial fishing

Small-scale is 3.1 to 20 GT, medium-scale 20.1 to 150 GT and large-scale above 150 GT, so a 100 GT vessel is medium-scale.

16. A. 600 kg

1 ha = 10,000 m2, so 1,500 kg x (4,000 / 10,000) = 600 kg.

17. B. Branch lines

Branch lines (snoods) hang from the main line and carry the baited hooks; float lines connect the main line to buoys.

18. D. Lowers water activity below what microbes need

Removing water reduces water activity; most spoilage bacteria cannot grow below roughly 0.91 aw.

19. A. 0.67

F = Z - M = 1.2 - 0.4 = 0.8; E = 0.8 / 1.2 = 0.67.

20. D. Republic Act No. 10654

RA 10654 (2015) amended RA 8550 with stronger measures and penalties against IUU fishing.

21. A. 77%

Survival = 15,400 / 20,000 x 100 = 77%.

22. B. 0.50

Hanging ratio E = hung length / stretched length = 50 / 100 = 0.50.

23. B. Scombroid poisoning from histamine

Temperature abuse lets bacteria decarboxylate histidine in scombroid fish into histamine, causing these allergy-like symptoms.

24. A. 0.368

N/N0 = e^(-Z t) = e^(-0.5 x 2) = e^(-1) = 0.368.

25. C. Fisheries and Aquatic Resources Management Councils

FARMCs are the multi-sectoral councils at national, municipal and integrated levels that advise on fisheries management.

26. C. 3.22% per day

SGR = (ln 125 - ln 5) / 100 x 100 = ln 25 / 100 x 100 = 3.22% per day.

27. B. 40 mm

Stretched mesh size equals two bar lengths: 2 x 20 mm = 40 mm.

28. C. Phenols

Phenolic compounds in wood smoke give smoked flavor and color and have antioxidant and antimicrobial effects.

29. B. 5.0%

GSI = gonad weight / body weight x 100 = 45 / 900 x 100 = 5.0%.

30. C. Republic Act No. 8800

RA 8800, the Safeguard Measures Act, allows temporary measures when increased imports cause or threaten serious injury to a domestic industry.

31. A. 15 kg

Biomass = 10,000 x 0.05 kg = 500 kg; daily feed = 500 x 0.03 = 15 kg.

32. A. To attract and aggregate pelagic fish

Payao are fish aggregating devices; floating objects draw tuna and other pelagic fish, making them easier to catch.

33. D. Clostridium botulinum spores

Low-acid foods (pH above 4.6) can support C. botulinum, so thermal processes are designed around its heat-resistant spores.

34. B. 1,000 fish

N = (M x C) / R = (200 x 150) / 30 = 1,000 fish.

35. D. To protect stocks during spawning or recruitment

Closed seasons stop fishing during critical life stages such as spawning so the stock can replenish itself.

36. A. Chanos chanos

Milkfish (Chanos chanos) is euryhaline and grazes on natural pond food such as lablab, making it the main brackishwater pond species.

37. D. Positive phototaxis of the target species

Many squid and small pelagics, and the plankton they feed on, are attracted to light, concentrating them near the gear.

38. D. Enzymes in the fish and halophilic microbes

In fish sauce fermentation, the fish's own proteolytic enzymes plus salt-tolerant microbes hydrolyze protein into peptides and amino acids.

39. A. Eutrophication

Nutrient enrichment causes excessive algal growth; decomposition of the blooms depletes oxygen and kills fish.

40. C. Prohibited use of noxious or poisonous substances

The Fisheries Code prohibits fishing with explosives, noxious or poisonous substances such as cyanide, and electricity.

41. D. Feeding fry with 17-alpha-methyltestosterone feed

Adding 17-alpha-methyltestosterone to feed during early fry stage directs sexual differentiation toward males.

42. B. Turtle excluder device

A turtle excluder device (TED) lets sea turtles and other large bycatch escape while shrimp pass to the cod end.

43. C. They act as cryoprotectants for myofibrillar protein

Sugars and sorbitol protect myofibrillar proteins from freeze denaturation, preserving gel-forming ability.

44. A. The layer where temperature drops sharply with depth

The thermocline (metalimnion) separates the warm epilimnion from the cold hypolimnion and has the steepest temperature gradient.

45. D. Converting mangroves into fishponds is prohibited

RA 8550 prohibits converting mangroves into fishponds or other purposes, in view of their ecological role.

46. C. Night respiration depleting dissolved oxygen

With no photosynthesis at night, respiration by plankton, fish and bacteria lowers dissolved oxygen to its daily minimum near dawn.

47. A. 100 kg per haul

Effort = 12 x 3 = 36 hauls; CPUE = 3,600 / 36 = 100 kg per haul.

48. A. 60%

Yield = 18 / 30 x 100 = 60%.

49. A. 50 kcal

Herbivores get 5,000 kcal, primary carnivores 500 kcal, and secondary carnivores 50 kcal.

50. D. Fishpond Lease Agreement

Public lands available for fishpond development are leased to qualified persons through a Fishpond Lease Agreement.

51. C. A benthic mat of blue-green algae and diatoms

Lablab is a bottom-growing complex of blue-green algae, diatoms and associated organisms that serves as natural food for milkfish.

52. A. 60 m

Depth = speed x time / 2 = 1,500 x 0.08 / 2 = 60 m (the pulse travels down and back).

53. D. 27.5 kg

Dry solids = 100 x 0.22 = 22 kg; final weight = 22 / 0.80 = 27.5 kg.

54. C. Paralytic shellfish poisoning

Pyrodinium produces saxitoxins that accumulate in filter-feeding shellfish and cause paralytic shellfish poisoning.

55. B. Spillover

Spillover occurs when adults and larvae produced inside a protected area move out and boost catches in surrounding fishing grounds.

56. A. High pH and high temperature

The NH3/NH4+ equilibrium shifts toward toxic NH3 as both pH and temperature rise.

57. B. 55.6 km

Distance = 10 x 3 = 30 nautical miles; 30 x 1.852 km = 55.6 km.

58. D. Total volatile basic nitrogen

TVB-N (ammonia, trimethylamine and other volatile bases) accumulates as bacteria and enzymes break down fish tissue.

59. B. They serve as nursery grounds for many juveniles

Mangrove roots give shelter and food to juvenile fish, shrimp and crabs, many of which later recruit to offshore fisheries.

60. D. Lower than the effort at MSY

Because costs rise with effort, profit peaks before catch peaks, so MEY effort is below MSY effort.

61. C. Carrageenan

Kappaphycus is the principal raw material for kappa-carrageenan; agar comes from Gracilaria and alginate from brown seaweeds.

62. C. Ghost fishing

Lost or abandoned gear that keeps catching animals without anyone retrieving it is called ghost fishing.

63. D. It forms small ice crystals that cause less drip loss

Rapid passage through the zone of maximum ice crystal formation produces small crystals that damage cells less, reducing drip on thawing.

64. C. They have expelled their symbiotic zooxanthellae

Heat stress causes corals to expel zooxanthellae, the pigmented algae that give them color, which is called bleaching.

65. A. It is dissipated as more boats enter

Profits attract new entrants until total costs equal total revenue, dissipating rent, often with overfishing.

66. B. To induce final oocyte maturation and spawning

Hypophysation supplies gonadotropins that trigger final maturation and ovulation in fish that do not spawn naturally in captivity.

67. A. To keep the school feeding near the boat

Chumming with live bait excites the school into a feeding frenzy near the vessel, where it is caught with barbless lures.

68. C. To reduce dehydration and fat oxidation

The glaze sublimes instead of the fish, protecting against freezer burn and limiting oxygen contact with fish fat.

69. D. Catadromous

Catadromous fish live in fresh water and migrate to the sea to spawn; anadromous fish do the reverse.

70. C. Ecosystem approach to fisheries management

EAFM balances ecological and human well-being through good governance, considering the whole ecosystem.

71. C. Nauplius, zoea, mysis, postlarva

Penaeid shrimp hatch as nauplii, then pass through zoea (protozoea) and mysis stages before becoming postlarvae.

72. B. One is anchored to the seabed; the other floats freely

A bottom-set gill net is anchored on or near the bottom for demersal fish, while a drift gill net moves with the current to catch pelagic fish.

73. C. Sublimation of ice from the fish surface

In unprotected frozen fish, ice sublimes from the surface, leaving dry, porous, discolored tissue.

74. D. Otolith

Otoliths add calcium carbonate layers as the fish grows, forming increments that can be counted to estimate age.

75. B. Co-management

Co-management shares management authority and responsibility between government and resource users.

76. C. To raise the C:N ratio so heterotrophic bacteria take up ammonia

Added carbohydrate raises the carbon-to-nitrogen ratio, letting heterotrophic bacteria assimilate ammonia into microbial protein (floc).

77. C. Boat-operated lift net used with lights

The basnig is a lift net operated from a boat; lights attract fish over the net, which is then raised.

78. D. Conduct a hazard analysis

HACCP begins with analyzing hazards; critical control points, limits, monitoring, corrective action, verification and records follow.

79. A. It drinks seawater and excretes salt through gill cells

Marine teleosts are hypo-osmotic to seawater, so they drink it and eliminate excess salt via chloride cells in the gills.

80. B. Innovators

Adopter categories in order are innovators, early adopters, early majority, late majority and laggards.

81. D. 300 m3

Daily exchange = 3,000 m3 x 0.10 = 300 m3.

82. A. To guide fish toward the trap chambers

Fish swimming along the leader are directed into the heart and playground chambers, from which they cannot easily escape.

83. C. Thermal processing in the retort

Retorting at a validated time and temperature is the step that eliminates pathogenic spores, so it is controlled as a CCP.

84. A. It maximizes oxygen uptake across the lamellae

Countercurrent exchange keeps a favorable oxygen gradient along the whole lamella, so the blood extracts most of the available oxygen.

85. C. Result demonstration

A result demonstration shows the actual outcome of a practice under local conditions to convince other farmers.

86. D. 1.2 mL

Dose = 0.5 mL/kg x 2.4 kg = 1.2 mL.

87. C. 120 m

Warp length = 3 x 40 m = 120 m.

88. A. Vacuum packing to exclude oxygen

Rancidity comes from lipid oxidation; removing oxygen by vacuum packing (or glazing, antioxidants) slows it.

89. A. Diatoms

Diatoms have two-part silica frustules; dinoflagellates have cellulose plates or none.

90. D. 1.20

BCR = PV benefits / PV costs = 1.8 / 1.5 = 1.20, which is above 1, so the project is acceptable.

91. C. Each species uses a different food niche

Polyculture combines species with complementary feeding habits (phytoplankton, zooplankton, bottom detritus) to use pond food more fully.

92. B. 0.25 L/kg

Fuel = 20 x 15 = 300 L; 300 / 1,200 = 0.25 L per kg of fish.

93. B. Bright red gills and clear, bulging eyes

Fresh fish have bright red gills, clear convex eyes, firm elastic flesh and a mild sea odor.

94. A. 24,000 eggs

Eggs per gram = 400 / 0.5 = 800; fecundity = 800 x 30 = 24,000 eggs.

95. B. PHP 150

Break-even price = total cost / production = 450,000 / 3,000 = PHP 150 per kg.

96. B. 25 kg

16-20-0 contains 20% P2O5: 10 / 0.20 = 50 kg per ha; for 0.5 ha, 50 x 0.5 = 25 kg.

97. B. 21.0 cm

L50 = selection factor x mesh size = 3.5 x 60 mm = 210 mm = 21.0 cm.

98. D. It surrounds the fish closely and cools them faster

Slurry ice is a pumpable mix of fine ice and seawater that contacts the whole fish surface, giving rapid and uniform cooling.

99. B. Protogynous hermaphroditism

Protogyny is female-first sex change; protandry is male-first, as in some anemonefish.

100. C. 25%

Net income = 600,000 - 480,000 = 120,000; ROI = 120,000 / 480,000 x 100 = 25%.

101. A. Abundant plankton in moderately flowing water

Mussels are filter feeders, so growth depends on plankton-rich water renewed by moderate currents.

102. D. Trolling line

Trolling lines are dragged behind a moving vessel so the lure imitates swimming prey for fast pelagic fish.

103. D. Gracilaria

Gracilaria is the leading agarophyte; Kappaphycus yields carrageenan and Sargassum yields alginate.

104. D. 3,000 t

MSY = rK/4 = 0.6 x 20,000 / 4 = 3,000 t.

105. C. 3 years

Payback = investment / annual net cash flow = 900,000 / 300,000 = 3 years.

106. B. Stop fertilizing and exchange some water

Very low Secchi readings indicate an excessive bloom that risks night-time oxygen depletion, so fertilization is stopped and water diluted.

107. D. 1,852 m

One nautical mile is defined as 1,852 m; 1,609 m is a statute mile.

108. D. Kench salting

In kench salting the liquid drains off; in pickle salting the fish stays immersed in the brine that forms.

109. A. Seagrasses are flowering plants with true roots

Seagrasses are marine angiosperms with roots, rhizomes and flowers, while seaweeds are algae lacking true roots and vascular tissue.

110. B. Vessel monitoring system

A VMS uses onboard transceivers to transmit vessel location automatically, supporting enforcement against illegal fishing.

111. C. 15,000

Fish needed at harvest = 3,000 / 0.25 = 12,000; fingerlings to stock = 12,000 / 0.80 = 15,000.

112. B. Mesh size of the netting

Size selectivity in nets is controlled mainly by mesh size, which determines which fish can pass through.

113. B. 2,500 kg

Batches per day = 20 / 4 = 5; capacity = 5 x 500 kg = 2,500 kg.

114. C. A heavy load of decomposable organic matter

BOD measures the oxygen used by microbes to break down organic matter, so a high BOD signals organic pollution.

115. C. Bureau of Fisheries and Aquatic Resources

BFAR, under the Department of Agriculture, is the lead agency for fisheries and aquatic resources.

116. A. They fit the small mouth gape of first-feeding larvae

Rotifers are small, slow-swimming and easy to mass-culture, matching the tiny mouth of first-feeding marine larvae.

117. C. Beach seine

A beach seine is set from a boat around the fishing area and pulled ashore by its two hauling ropes.

118. B. Gut enzymes and bacteria quickly attack the belly wall

Digestive enzymes and gut bacteria cause belly burst and fast spoilage, so early gutting extends storage life.

119. D. Chanidae

Milkfish is the only living species of family Chanidae; tilapia is Cichlidae, mullets Mugilidae, rabbitfish Siganidae.

120. B. The municipal or city government

The Fisheries Code and Local Government Code give LGUs jurisdiction over municipal waters, including registering municipal fishers.

Topics to review

- Aquaculture systems and water quality
- Capture fisheries and stock assessment
- Aquatic ecology and resource management
- Fish handling, processing and safety

Online question banks and study resources

Fisheries - Pass Harbor (Question bank)

Official PRC board information

Current PRC exam programs

Independent study material prepared by Board Exam Desk.