FFA Marine Technology - Fisheries Specialty
Possible Test Questions

Problem 1.
You want to hang a drift gillnet, consisting of three 50-fathom shackles, of 5-1/2" web, 29 mesh deep, hung "even", with 100-lb. leadline. Pick up three meshes per hanging.
   a) Calculate the materials to order, including amount of web, cork and lead lines, and number of corks of correct size.
   b) What is the hanging distance on the corkline, and how many hangings?

Problem 2.
You have a 22' aluminum boat with 75 h.p. two-cycle outboard motor. At 80% output the motor pushes the boat at 18 knots. You have to make a trip to a destination 27 nautical miles away, and return. Using the "rule of thirds", how much gasoline will you have to carry, and how much oil will you mix in it, given a fuel to oil ratio of 50:1.

Problem 3.
You want to buy a boat which costs $150,000. Your banker tells you he requires 20% down payment, and the payback is over 20 years at 7.0% interest. You use an amortization table and loan progress chart to calculate payments.
   a. How much will you need for your down payment?
   b What are your monthly payments?
   c. How much money in total, and how much in interest, will you pay over the life of the loan?

Problem 4.
Irrespective of how good the fishing or what the price is, you will have fixed costs which include: Insurance - $3000, Fuel- $2600, Boat storage - $1600, Property tax - $800, Food -$1800, Gear replacement -$2500, Boat maintenance and repair - $4700, License and permit renewal -$300, and Miscellaneous expenses of $2500. In addition, you have a variable crew cost, calculated at 25% of your gross.
   a. Prices are only 68 cents per pound. How many pounds will you have to catch to break even? Your average catch has been 75,000 pounds of fish per season.
   b. The price has to be at least how much per pound for you to break even with that catch?
   c. At $.68 per pound, what would be your net return at 75,000lbs.?

Problem 5
You know that correct scope for anchoring your boat is 7:1.
Your anchor roller is five feet above the water. The water is six fathoms deep. How many feet of rode should you pay out over your roller when you anchor?

Problem 6 Do a correct mayday call for the sinking boat Prosta Tak

Problem 7.
You decide to buy a Genset electrical generator for your boat, and want to know how what generation output (in Kilowatts kW) to buy. You do an AC energy budget and find the follow electricity needs.

Refrigerator	10 amps	12 hours
Water heater	12 amps	6 hours
Chest freezer	6 amps	12 hours
Microwave	8 amps	25 hour
Electric drill	5 amps	25 hour
Computer	2 amps	1 hour

What output capacity of Genset generator do you need (Generators are sized in one-kW increments)?

**FFA Test Answers
and Explanatory Materials**

Problem 1
Refer to "Gillnet Hanging" by Paula Cullenberg, Alaska Marine Advisory Bulletin No. 29.

Answers: 300 fathoms of web, 165 fathoms of cork line, 165 fathoms of lead line, and 253 to 316 corks of the 21 oz. size. (Buoyance of cork is about 1.3 pounds. You need 2.0 to 2.5 times the weight of the leadline, which is 165 pounds, or 330 to 412 lbs. of flotation, divided by 1.3). Hanging distance of the floats is- (5-1/2 x 3) divided by ratio (2) = 8-1/4". Number of hangings is the length - 50 fathoms (3600 inches) divided by 8-1/4" =436 plus the first one = 437.

Problem 2.
A two-cycle gasoline engine produces approx. 10 h.p./gal/hr, so at 80% it is using 6 gal/hr. At 18 knots, it is going 3 nautical miles per gallon. Total distance to travel is 54 miles, divided by 3 mpg comes to 18gallons. The rule of thirds (a third to get there, a third to get back, and a third in reserve) indicates that total fuel to carry is 27 gallons. At a fuel/oil mix of 50:1, the amount of oil to be added to the gasoline would be slightly over 1/2 gallon.

Problem 3
   a. The Down payment would be $150,000 x 20% = $30,000
   b. From the amortization tables, at 10.0% interest over 20 years x $120,000, the monthly payments would be $1198.06.
   c. With the$30,000 down payment plus ($1209.39 x 240 months = $287,534.40) = $317,534.40 total. Subtract principal of $150,000 you will pay $167,534.40 in interest.. d. After eight years you would have paid $30,000 down payment, plus $1198.06 x 96 months = $115,013.76.

Problem 4

1. This is simple arithmetic, no study materials needed. Total of the fixed expenses will be $19,800.
    a.. To break even will require $26,400. At 68 cents, you need 38,823.5 pounds 26,400 divided by .68).
    b. $26,400 divided by 75,000 = $.352 per pound.
    c. $.68 x 75,000 = $51,000. $51,000 x 75% = $38,350 (after crewshare), minus $19,800 fixes costs = $18,450

Problem 5.

See Chapman Piloting, Ground Tackle: Anchors and Rodes pp. 253-262. Rode is the line, cable and chain which connects the anchor to the boat. Scope is the ratio of the length of rode deployed to the distance from the anchor roller to the sea bottom. In the problem the depth is 36 feet, plus five feet to the roller, for a total of 41 feet. Multiply by seven and the answer is 287 ft.

Problem 6.

a. Mayday Mayday Mayday
b. This is the Prosta Tak, the Prosta Tak, the Prosta Tak
c. Position - Ten nautical miles due west of Cape Constantine, Bristol Bay
d. Taking on water, sinking quickly
e. 58-foot limit seiner, white hull, blue decks
f. Five persons on board. Survival suits for all, inflatable liferaft, flares, VHF radio

Problem 7

1. Generators are sized in units of 1000 watts (kW) and watts are amps x volts. So, for example, 6 amps at 120 volts equals 720 watts.
2. A Genset generator should be sized to provide for operation simultaneously for all the items that are likely to be operated at once, even though most of them will not be operating continuously. However, wattage of items that are used only intermittently and not likely to be used at the same time do not have to be added together; just count the wattage of the bigger drain item.
3. In the problem the refrigerator (10 amps), water heater (12 amps), freezer (6 amps) should be added, for a total of 28 amps, plus add 8 amps for the microwave, assuming that you will remember not to run the microwave at the same time as the drill and computer.
4. The combined 36 amps x 120 volts =4320 watts continuous. Generator should be at least 5 kW.