Aquatic Exam Study Guide
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A little thoughtful preparation will go a long way towards passing the Aquatic exam. The manual used for this exam is called the "Aquatics Manual." This is not an easy exam to study for because there are no study questions at the back of each chapter of the manual.

What's on the exam?
The Aquatic Exam consists of 50 multiple choice questions broken down as follows:
- 24 questions on basic aquatics - from the Aquatic Pest Control Manual
- 4 aquatic plant ID questions - from the Aquatic Pest Control Manual
- 13 math questions - some similar examples are in the manual
- 9 questions concerning label interpretation.

To prepare for the exam:
1) Read the manual thoroughly.
2) Read this Aquatic Exam Study Guide, including the vocabulary.
3) Review the formulas to make sure you understand how they work.
4) Work all the math questions.
5) When you get to the label section, read the following label carefully and become familiar with what information is on the label and where it is located. The questions in this study guide are similar to those on the exam. Use the label to find the answers. Looking up the answers to the following questions will also provide good practice for the exam.
6) Look up the following information on the label provided:
   - Identify the active ingredient.
   - Identify the signal word.
   - Determine if there are restrictions on who the product can be sold to.
   - Determine if the product can be legally used: indoors, outdoors, both indoors and outdoors, or neither indoors and outdoors.
   - Determine what to do if the product is accidentally swallowed. Do you induce vomiting or not?
   - Read the environmental hazards statement. Determine which sites or types of animals the applicator should either be cautious of or not use the product near.
When you've completed all the above steps, you should be fairly well prepared for the exam. You must get 70% of the questions correct to pass the exam. That means you can miss 15 questions and still pass.

**USEFUL FORMULAS**

The following formulas are included in the exam booklet just prior to the math problems.

Area of a circle = \( \pi \times r^2 = 3.14 \times (\text{radius} \times \text{radius}) \)  
\( \pi = 3.14; \text{radius} = \frac{\text{diameter}}{2} \)

Surface acres of a circular site = \( \frac{\text{area of the circle}}{43,560} \)

Acre-feet = surface acres \( \times \) average depth (feet)

Travel speed = \( \frac{\text{distance traveled}}{\text{time elapsed}} \)

Acres per minute (apm) = \( \frac{\text{swath width(ft)} \times \text{travel speed(fpm)}}{43,560} \)

Gallons per acre (gpa) = \( \frac{\text{gallons sprayed}}{\text{acres treated}} \)

Gallons per minute (gpm) = \( \frac{\text{gallons sprayed}}{\text{minutes elapsed}} \)

Pounds of active ingredient needed = \( \text{PPM}_{\text{desired}} \times \text{acre-feet} \times 2.7 \)

Herbicide per tank = \( \frac{\text{tank capacity} \times \text{herbicide rate per acre}}{\text{amount of spray applied per acre}} \)

Herbicide per tank = \( \frac{\text{tank capacity} \times \% \text{ solution needed}}{100\%} \)
Aquatic Exam
Sample Math Questions
Revised 4-24-00

1) A canal needs to be treated. The canal is 4 miles long and 20 ft wide. What surface area will you treat?
   A) 80 acres
   B) 1056 acres
   C) 9.7 acres
   D) 2.4 acres

2) A local lake is about 3 miles across and roughly circular. What is the approximate surface area in acres?
   A) 450
   B) 1276
   C) 4522
   D) 7920

3) How many acre-feet in a rectangular pond 500 ft wide and 1000 ft long with an average depth of 10 ft?
   A) 41.3
   B) 114.8
   C) 330.5
   D) 1148.9

4) What is the speed (in ft per minute) of a boat that sprays a 20 ft swath while moving 120 ft every 40 seconds?
   A) 30
   B) 180
   C) 240
   D) 800

5) A spray boat is fitted with a 300 gallon tank and calibrated to spray 25 gallons per acre. What is the maximum number of acres the boat can treat?
   A) 4
   B) 8
   C) 10
   D) 12
6) Which of the following best describes the output rate (in gallons per minute) of a pump that delivers 21 gallons in a 4 minute trial?

A) 2.5
B) 3.3
C) 4.6
D) 5.5

7) Which of the following best identifies the gallons of surfactant needed in a 200 gallon tank in order to have a 1.5% concentration in the tank?

A) 1.5
B) 2.5
C) 3.0
D) 4.0

8) Which of the following best identifies the total gallons of spray mix needed to treat 3 miles of canal bank (both sides) when the treatment swath is 15 ft per side and the equipment has been calibrated to apply 35 gallons of spray mix per acre?

A) 127
B) 190.7
C) 381.8
D) 453.6

9) If a direct-metering system known to deliver 3.2 fluid ounces of herbicide per minute is on a boat that treats .05 surface acres per minute, how many gallons of herbicide product will be applied per acre?

A) .50
B) .75
C) 1.0
D) 1.25

10) A boat fitted with a direct-metering device covers .05 surface acres per minute. The herbicide calls for an application rate of 2 quarts of product per acre. Which of the following best indicates the number of fluid ounces of herbicide product that the direct-metering device must deliver per minute?

A) 1.5
B) 3.2
C) 5.5
D) 7.1
11) A boat mounted spreader needs to apply a 15% pelletized herbicide at a rate of 50 pounds per acre. Testing reveals that boat treats .5 acres per minute. Which of the following best identifies the pounds of pellets that this spreader must broadcast each minute?

A) 3.75  
B) 15  
C) 25  
D) 60

12) Which of the following best identifies the spray volume rate (in gallons per acre) being delivered by a handgun that discharges 2.0 gallons of spray per minute as it treats a swath 15 feet wide? The handgun is being operated from a truck traveling along the canal bank at a speed of 100 feet per minute.

A) 21  
B) 37  
C) 60  
D) 72

13) Which of the following approximates the total amount of 5% pelletized herbicide needed to treat 2 miles of canal at a rate of 40 pounds of pellets per acre? The canal is 25 feet wide.

A) 135  
B) 242  
C) 370  
D) 412

14) Which of the following best identifies the number of gallons of an algicide containing 3 pounds of active ingredient per gallon of formulation needed to treat a 3 acre pond that has an average depth of 10 ft? The product label specifies a .5 PPM active ingredient treatment rate.

A) 5.7  
B) 10  
C) 13.5  
D) 40.5
Answers to
Aquatic Exam
Sample Math Questions

1) C
2) C
3) B
4) B
5) D
6) D
7) C
8) C
9) A
10) B
11) C
12) C
13) B
14) C