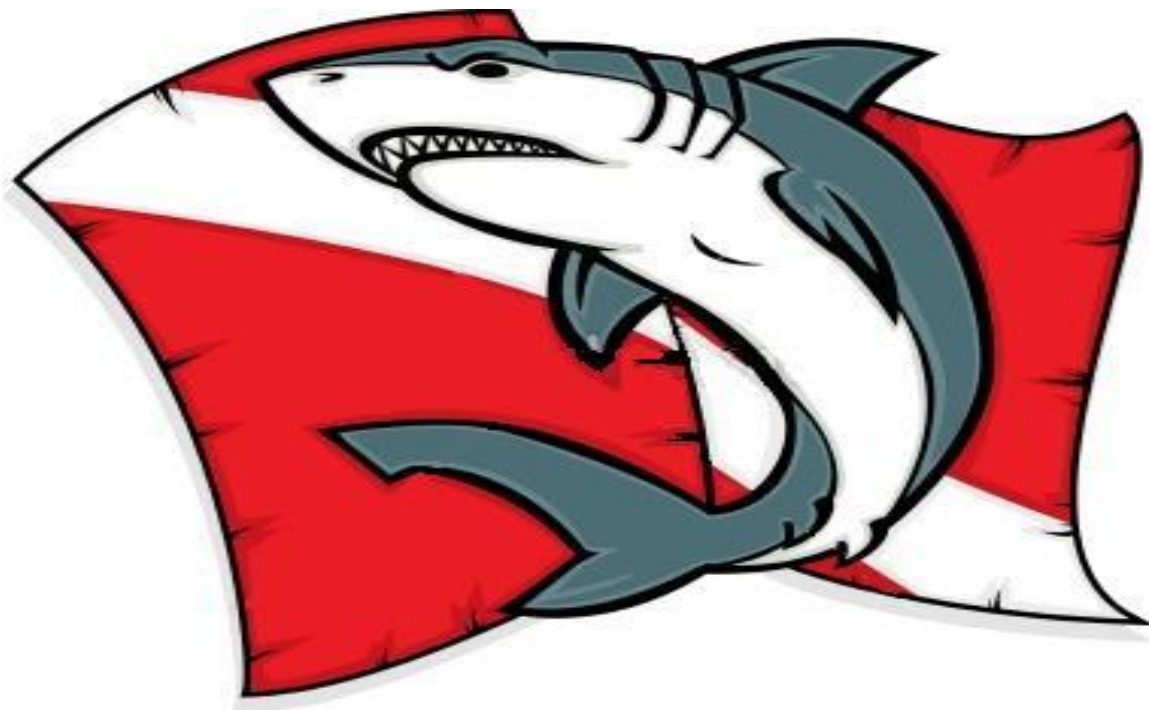




University Scuba

EXSA 1259

Master Scuba Diver



Workbook

SCUBA DIVER - OPEN WATER KNOWLEDGE REVIEW

1. In salt water, an absolute pressure of four atmospheres is reached at a depth of?
2. At a depth of 33 feet, what is the gauge pressure?
3. A container filled with air having a volume of 3 liters at 33 ft., what will the volume be at the surface?
4. What are the percentages of O² and N² in the air that we breathe underwater?
5. Define buoyancy.
6. Describe the differences in buoyancy in salt water and fresh water.
7. Define a squeeze.
8. The greatest percentage change in pressure takes place at what depth upon ascent?
9. Describe the physical condition a diver should be in.
10. Excessive hyperventilation before breath-hold diving can lead to?
11. Define equalization and how often should it be used?
12. A pain just behind the eyes while diving is due to?
13. Rupture of the ear drum underwater is likely to produce?

SCUBA DIVER - OPEN WATER KNOWLEDGE REVIEW (continued)

14. What is nitrogen narcosis?
15. What is the most important rule in scuba diving?
16. Continued loss of body heat will result in?
17. What effect will a wetsuit have on your buoyancy?
18. Describe the proper use of a BCD.
19. Scuba tanks should always have pressure to prevent them from?
20. Name and describe the two kinds of inspections a scuba tank must have.
 - a.
 - b.
21. What will happen if you attempt to remove a regulator from a scuba tank without first turning off the air?
22. Define bottom time.
23. What is the recommended rate of ascent?
24. What is decompression sickness?
25. After a dive to 42 ft. with a bottom time of 27 min., your repetitive group is?
26. What does the repetitive group designator represent?

SCUBA DIVER - OPEN WATER KNOWLEDGE REVIEW (continued)

27. A repetitive dive is a dive made within ____ hours of a previous dive.

28. What is the no decompression limit at 60 feet? What does this mean?
 - a.

 - b.

29. A diver makes two dives, one to 80 ft. for 20 min., and one to 60 ft. If the diver has a surface interval of 1 hr. and 20 min., what is the maximum time he can stay down on his second dive?

30. A diver makes two dives, one to 90 ft. for 15 min., and one to 70 ft. for 30 min. What is the minimum surface interval required to make both dives?

31. If you are properly weighted in salt water and you completely deflate your BCD, take a normal breath, come to a vertical position and hold still, you should?

32. What is the proper "omitted decompression" procedure?

33. What actions should you take if you are separated from your buddy?

34. If, during a dive, breathing from your regulator becomes difficult, you should suspect?

35. What is the hand signal for out of air?

36. If at any time during a dive you feel anxious or are having difficulty in any way you should?

CHAPTER ONE (continued)

SAFE DIVING TECHNIQUES

6. Briefly describe how to determine the proper amount of weight for diving and how to achieve and maintain neutral buoyancy while diving.

7. List five emergency ascent procedures and arrange them in the recommended order of preference.
 - a.
 - b.
 - c.
 - d.
 - e.

CHAPTER TWO

PHYSICS

1. Paraphrase Boyle's Law:

Dalton's Law:

Charles' Law:

Henry's Law:

2. Correctly convert English Units of measurement used in diving to metric units and vice-versa.

3 meters	_____ ft.
1 cu. ft.	_____ gallons, _____ liters
20 fathoms	_____ ft., _____ meters
2 cu. ft. H ² O (fresh)	_____ lbs.
82 degrees C	_____ degrees F
10 statute miles	_____ nautical miles

CHAPTER TWO (continued)

PHYSICS

3. Define Gauge pressure:

Absolute Pressure:

Calculate: 33 ft. _____ psi absolute, _____ psi gauge

0 ft. _____ psi absolute, _____ psi gauge

14.7 psi _____ ft. absolute, _____ ft. gauge

4. If a balloon containing 3 liters of air is taken to a depth of 66 ft. of water, its volume at depth would be:
5. If a balloon containing 5 pints of air at 92 ft. is released, its volume at the surface would be:
6. A small boat which occupies 3 cu. ft. of space sits in 92 ft. of fresh water. The small boat weights 238 lbs. How much lift in lbs. is needed to bring the boat to the surface?
7. How much weight does it require to sink an object that weighs 5 lbs. and occupies a space of 2 cu. ft. in salt water?
8. A diver with a 67 cu. ft. 3000 psi tank uses $\frac{1}{4}$ of his air in 15 min. at a constant depth of 70 ft. in sea water. His surface air consumption rate in psi per min. is?
9. An air consumption rate of 40 psi per min. using a 3000 psi 67 cu. ft. tank is equal to _____ cubic feet per minute.

CHAPTER TWO (continued)

PHYSICS

10. If a diver has a Surface Air Consumption rate of 25 psi/min. with an 80 cu. ft. tank, the same tank filled to 2500 psi will last approximately _____ minutes at a depth of 100 ft. if the diver begins ascending with 500 psi of air in the tank.
11. If a tank contains 71.2 cu. ft. of air at a pressure of 2475 psi; approximately _____ cu. ft. of air remains at 2250 psi if the temperature remains constant.
12. If an 80 cu. ft. tank filled to 3000 psi at a temperature of 75 degrees F is stored in the trunk of your car with a temperature of 110 degrees F. The pressure in the tank will increase to _____ psi.

CHAPTER THREE

PHYSIOLOGY

1. Explain generally and diagram the process of human respiration and circulation.
2. State the cause (a) signs and symptoms,(b) effects, (c) first aid, and (d)prevention of the following:

Respiratory Distress

Asphyxia, suffocation and strangulation:

- a.
- b.
- c.
- d.

CHAPTER THREE (continued)

PHYSIOLOGY

Breathing resistance:

- a.
- b.
- c.
- d.

Carbon dioxide excess:

- a.
- b.
- c.
- d.

Overexertion:

- a.
- b.
- c.
- d.

Carbon monoxide toxicity:

- a.
- b.
- c.
- d.

Oxygen toxicity:

- a.
- b.
- c.
- d.

Hyperventilation and shallow-water blackout:

- a.
- b.
- c.
- d.

Near drowning:

- a.
- b.
- c.

CHAPTER THREE (continued)

PHYSIOLOGY

Nitrogen narcosis:

- a.
- b.
- c.
- d.

Decompression Sickness:

- a.
- b.
- c.
- d.

Circulatory Distress

Cramps:

- a.
- b.
- c.
- d.

Carotid sinus reflex:

- a.
- b.
- c.
- d.

Heart attack and arrest:

- a.
- b.
- c.
- d.

Barotrauma

Ears:

- a.
- b.
- c.
- d.

CHAPTER THREE (continued)

PHYSIOLOGY

Sinuses:

- a.
- b.
- c.
- d.

Teeth:

- a.
- b.
- c.
- d.

Lungs:

- a.
- b.
- c.
- d.

Gastrointestinal:

- a.
- b.
- c.
- d.

Thermal Stress

Hyperthermia:

- a.
- b.
- c.
- d.

Hypothermia:

- a.
- b.
- c.
- d.

CHAPTER THREE (continued)

PHYSIOLOGY

Heat exhaustion:

- a.
- b.
- c.
- d.

Heat stroke:

- a.
- b.
- c.
- d.

Motion-sickness:

- a.
- b.
- c.
- d.

Disorientation:

- a.
- b.
- c.
- d.

Vertigo:

- a.
- b.
- c.
- d.

Dehydration:

- a.
- b.
- c.
- d.

CHAPTER THREE (continued)

PHYSIOLOGY

Diver Stress:

- a.
 - b.
 - c.
 - d.
-
3. Explain the effects of diving on women and state proper recommendations related to diving regarding pregnancy and other female considerations.

CHAPTER FOUR

NIGHT DIVING AND NAVIGATION

1. List three items of equipment required for diving at night.
 - a.
 - b.
 - c.

2. Briefly describe how to plan and prepare for a night dive.

3. Describe the basic standard dive light signals.
 - a.
 - b.
 - c.

4. Explain when and where disorientation is likely to occur while diving at night and how to prevent the disorientation.

CHAPTER FOUR (continued)

NIGHT DIVING AND NAVIGATION

5. List four methods which will help a diver maintain buddy contact.
 - a.
 - b.
 - c.
 - d.

6. List five techniques that are unique to diving at night.
 - a.
 - b.
 - c.
 - d.
 - e.

7. List at least eight items of equipment for diving navigation.
 - a.
 - b.
 - c.
 - d.
 - e.
 - f.
 - g.
 - h.

8. List at least five ways to measure distance underwater.
 - a.
 - b.
 - c.
 - d.
 - e.

9. List at least six natural aids to navigation.
 - a.
 - b.
 - c.
 - d.
 - e.
 - f.

10. Briefly contrast direct and indirect reading compasses.

11. Briefly describe how to determine and prevent compass deviation.

12. List four parts of a compass.
 - a.
 - b.
 - c.
 - d.

CHAPTER FIVE

ENVIRONMENT

1. Identify, explain the (a) cause, (b) possible effects upon divers and (c) how to cope with the effects of:

Waves and surf:

Tides:

Seiches:

Currents

Long Shore:

Rip:

Wind:

River:

Thermal changes (upwelling and thermal stratification):

Haloclines:

Bottom conditions:

Man-made structures:

CHAPTER FIVE (continued)

ENVIRONMENT

Weather conditions:

Aquatic plants:

Hazardous aquatic animals:

Pollution:

CHAPTER SIX

EQUIPMENT

1. Briefly describe basic types, specific use and care of:

Tanks

Tank valves

Regulators

Depth gauges

Underwater time devices

Dive computers

Diving compasses

BCD

Wetsuit/Drysuit

Dive light

CHAPTER SEVEN

DEEP DIVING

1. Define
 - a. Decompression:

 - b. Recompression:

2. Briefly describe Haldane's Theory.

3. What is an M-value?

4. Briefly explain the proper procedures for:
 - a. A cold strenuous dive:

 - b. An ascent rate variation:

 - c. A surface interval of less than 10 minutes:

 - d. Multi-level diving:

 - e. Flying after diving:

5. State the two primary advantages of using a dive computer.
 - a.
 - b.

6. What is the recommended type of recompression chamber used in the treatment of decompression sickness and why is this type suggested.

7. Define altitude diving and list four procedural differences between diving at altitude and diving at sea level.
 - a.
 - b.
 - c.
 - d.

8. List at least five hazards associated with deeper diving.
 - a.
 - b.
 - c.
 - d.
 - e.

CHAPTER SEVEN (continued)

DEEP DIVING

9. List at least five equipment requirements for deeper diving.
 - a.
 - b.
 - c.
 - d.
 - e.
10. Briefly describe how to plan and prepare for a deep dive.
11. If you dive to 99 ft. for 30 min., what is the minimum surface interval required to make a repetitive no-decompression dive to a depth of 70 ft. for 30 min.?
12. Two hours after surfacing from a cold water dive to 60 ft. for 32 min. you plan a repetitive dive to 50 ft. Your adjusted maximum no-decompression time is:
13. You spend the first 5 min. of your first dive of the day at a depth of 110 ft., then spend another 18 min. at a depth of 50 ft. Your total ascent time from the 50 ft. level is ____ min. and your repetitive group is ____.
(Calculate as a multi-level dive.)
14. Your first dive is to 71 ft. for 22 min. followed by a surface interval of 31 min. Your second dive is to a depth of 50 ft. for 30 min. followed by a surface interval of 8 min. Your third dive is to a depth of 45 ft. for 22 min. What is your ending group designation letter?
15. What is D.A.N.? What can they do for you? What is the national emergency phone number?

CHAPTER EIGHT

SEARCH AND RECOVERY

1. Briefly describe how to plan and prepare for search and light salvage operations.

2. Describe at least three search patterns and explain when each should be used.
 - a.

 - b.

 - c.

3. Explain at least three safety procedures for lifting an object underwater using a lift bag.
 - a.

 - b.

 - c.

CHAPTER NINE

DIVER RESCUE TECHNIQUES

1. List the four steps to be taken when an underwater emergency is suspected.
 - a.
 - b.
 - c.
 - d.

2. In terms of self-rescue skills, describe the best means to handle an air depletion emergency.

3. List three signs of stress for divers at the surface and three signs for divers under water.

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4. List and define three categories of self-rescue.
 - a.
 - b.
 - c.

5. How would a self reliant diver handle the need to vomit under water?

6. How should a self reliant diver react to vertigo while under water?

7. What are some of the visible signs that would alert a rescue diver that someone is suffering from nitrogen narcosis?

8. When a problem occurs during a dive, what simple rule should be applied?

9. What behaviors can be observed in an individual prior to a dive that would alert a rescue diver that a problem could occur during the dive?

10. Briefly describe the actions you would take if you find your buddy unconscious and not breathing underwater.

Advanced Diving Technique Quiz

- List two reasons why a diver should not wear his/her mask on the forehead.
 -
 -
- Describe how to neutrally weigh yourself at the surface before a dive.
- List the common acronym that we use as a buddy check and the meaning of each letter.
 -
 -
 -
 -
 -
- What is the most important rule of scuba diving?
- Describe what a diver should do if separated from their buddy.
- List at least three reasons for diving with a buddy.
 -
 -
 -
- List at least four factors to be considered when planning a dive.
 -
 -
 -
 -
- Describe a squeeze and how it may be avoided for the following areas
 - Lungs:
 - Sinus:
 - Ears:
 - Mask:
- At the end of a dive it is customary to have _____ psi remaining pressure in the scuba tank. Why?
- Describe the proper way to ascend after a dive in excess of 60 feet?

Dive Table Quiz

1. List 10 important rules that should always be observed when using the NAUI Dive Tables. You may include NAUI recommended procedures.
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.
 - 7.
 - 8.
 - 9.
 - 10.

2. List 4 factors that can contribute to the onset of Decompression Sickness.
 - a.
 - b.
 - c.
 - d.

3. What is the procedure for an omitted decompression stop?

4. Why is Oxygen used in the treatment of Decompression Sickness? Be specific.

5. What should you do if you feel symptoms of Decompression Sickness after a dive?

6. List 10 possible symptoms of Decompression Sickness.
 - a.
 - b.
 - c.
 - d.
 - e.
 - f.
 - g.
 - h.
 - i.
 - j.

7. Fill in the blanks below:

