

University Scuba
Master Scuba Diver
Physiology

1. Select all correct answers: Attempting a Valsalva maneuver with excessive force can result in:
 - A. a ruptured eardrum
 - B. a ruptured round window in the middle ear
 - C. permanent tinnitus (ringing in the ear)
 - D. a reduction in hearing ability
2. A/an _____ causes severe neurological damage due to a blockage in the circulatory system.
 - A. Air embolism
 - B. Mediastinal emphysema
 - C. Subcutaneous emphysema
 - D. Spontaneous pneumothorax
3. The four disorders listed as answers in the previous question are caused by:
 - A. overexertion of the lungs
 - B. over expansion of the lungs
 - C. excess air in body tissue
 - D. excessive hyperventilation
4. A squeeze is the result of air pressure inside an air space being:
 - A. Equal to the external pressure
 - B. Greater than the external pressure
 - C. Less than the ambient pressure
 - D. Less than the gauge pressure
5. Nitrogen is the gas primarily responsible for which two of the following maladies:
 - A. Narcosis and bends
 - B. Narcosis and air embolism
 - C. Bends and air embolism
 - D. Emphysema and pneumothorax
6. Vertigo occurring during an ascent would most likely be caused by:
 - A. Decompression sickness
 - B. A reverse block that clears suddenly
 - C. Reduction of carbon dioxide partial pressure
 - D. A “trapdoor” effect on the Eustachian tube
7. A carotid sinus reflex is caused by pressure on the:
 - A. Chest
 - B. Stomach
 - C. Neck
 - D. Radial artery
8. Hemoglobin has an affinity for carbon monoxide that is _____ times greater than its affinity for oxygen.
 - A. 10
 - B. 50
 - C. 200
 - D. 600
9. Fitness for diving is greatly affected by pre-dive:
 - A. Nutrition
 - B. Rest
 - C. Apprehension
 - D. All of the above
10. What gas is responsible for the stimulus to breath in a healthy diver?
 - A. Oxygen
 - B. Nitrogen
 - C. Carbon monoxide
 - D. Carbon dioxide

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Equipment

1. An 1800 psi scuba cylinder is pressurized to ____ psig when hydrostatically tested.
 - A. 1800
 - B. 2400
 - C. 3000
 - D. 3600
2. The air entering a downstream valve in the second stage of a scuba regulator tends to ____ the valve.
 - A. Open
 - B. Close
 - C. Balance
 - D. Damage
3. At what stage in a regulator is the pressure converted from intermediate pressure to ambient pressure?
 - A. First stage
 - B. Intermediate stage
 - C. Second stage
 - D. Ambient stage
4. ____ Law best describes the process by which a SCUBA compressor operates.
 - A. Charles'
 - B. Dalton's
 - C. Boyle's
 - D. Henry's
5. The burst disc in the valve of a 2250 psi tank is designed to rupture at a pressure of about ____ psig.
 - A. 3,000-3,300
 - B. 3,400-3,700
 - C. 4,000-4,5000
 - D. None of the above
6. The reserve lever of a J-valve needs to be ____ when the tank is being filled.
 - A. Up
 - B. Down
 - C. In a neutral position
 - D. Removed
7. A regulator that uses air pressure rather than mechanical leverage to open the main valve of the second stage is a ____ regulator.
 - A. Tilt valve
 - B. Balanced
 - C. Pilot valve
 - D. Downstream
8. A safety feature of submersible pressure gauges is a:
 - A. Safety plug
 - B. Burst disc
 - C. Needle stop
 - D. High pressure dial face
9. Bourdon tubes are commonly used in:
 - A. Depth gauges
 - B. Submersible pressure gauges
 - C. Cylinder pressure gauges
 - D. All of the above
10. The 4 pressures acting in the second stage of a balanced regulator are:
 - A. Lung, water, spring, intermediate
 - B. Lung, water, spring, tank
 - C. Diaphragm, spring, intermediate, tank
 - D. Negative, gauge, ambient, intermediate

11. Special training is needed for drysuit diving.
- A. True
 - B. False
12. The purpose of an expansion chamber on the output of an air compressor is to extract:
- A. Condensation
 - B. Carbon dioxide
 - C. Carbon monoxide
 - D. Partial matter
13. A(an) ____ regulator will maintain a constant intermediate pressure in spite of varying tank pressure:
- A. Piston
 - B. Diaphragm
 - C. Unbalanced
 - D. Balanced
14. A disadvantage of 80 cubic foot aluminum tanks is:
- A. Greater susceptibility to damage than steel tanks
 - B. Sensitivity to heat
 - C. Electrolysis between valve and tank
 - D. All of the above
15. Green discoloration on the filter in the first stage of a regulator indicates:
- A. Corrosion from an aluminum tank
 - B. Water has entered the regulator first stage
 - C. Compressor filter dust from scuba tanks
 - D. None of the above

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Dive Tables/ Haldanes Theory

1. The no-decompression limits for the NAUI dive tables:
 - A. Are the U.S. Navy no-decompression limits
 - B. Are less than the U.S. Navy limits
 - C. Must be adjusted according to a “personal factors” formula
 - D. Are the U.S. Navy no-decompression limit for the next greater depth

2. The maximum rate of descent for recreational diving is:
 - A. 60 feet per minute
 - B. 75 feet per minute
 - C. 120 feet per minute
 - D. limited only by equalization

3. The dive schedule for a cold or strenuous dive should be:
 - A. The next greater bottom time
 - B. The next greater depth
 - C. The next greater time and depth
 - D. The next lesser time and depth

4. The bottom times for two consecutive dives should be added together and considered a single dive when:
 - A. The residual nitrogen time from the first dive exceeds the bottom time of the second dive
 - B. The surface interval between the dives is less than 10 minutes.
 - C. The bottom time of the two dives is less than the no-decompression limit for a single dive to the deepest depth of the two dives
 - D. Hades freezes over

5. The greatest benefit from the use of a dive computer is:
 - A. Extremely accurate time and depth information
 - B. Avoidance of maximum-time-at-maximum-depth penalty
 - C. Avoidance of errors with manual dive table calculations
 - D. None of the above

6. The length of time that should be spent decompressing at the 20 foot stop when carrying out the procedure for omitted decompression:
 - A. The same as the amount of time required for the ten foot stop
 - B. None because in-water decompression is inappropriate
 - C. Half the amount of time required for the ten foot stop
 - D. Twice the amount of time required for the ten foot stop

7. Special tables and procedures are required when diving at elevations above:
- A. Sea level
 - B. 500 feet
 - C. 1000 feet
 - D. 2500 feet

Note: For the following problems do not include precautionary decompression stops as part of actual dive time.

8. If you dive to 99 feet for 20 minutes, the minimum surface interval required to make a no-required-decompression dive to a depth of 60 feet for 30 minutes is:
- A. 10 minutes
 - B. 41 minutes
 - C. one hour and 30 minutes
 - D. two hours and 28 minutes
9. Two hours after surfacing from a cold dive of 27 minutes duration at a depth of 76 feet you plan a dive to a depth of 62 feet. Your maximum bottom time with no required decompression is:
- A. 26 minutes
 - B. 19 minutes
 - C. 25 minutes
 - D. none of the above
10. You spend the first 10 minutes of your first dive of the day at a depth of 103 feet, then spend another 18 minutes at a depth of 47 feet. Your total ascent time from the 50 foot level is ____minutes and your repetitive group following the dive is ____.
- A. 2 minute, G
 - B. 1 minute, K
 - C. 4 minute, I
 - D. 9 minute, J
11. Your first dive is to 65 feet for 25 minutes, followed by a surface interval of two hours. Your second dive is to a depth of 45 feet for 20 minutes, followed by a surface interval of eight minutes. Your third dive is to a depth of 42 feet for 28 minutes. Your repetitive group dive is:
- A. J
 - B. K
 - C. L
 - D. M
12. After three half times, a tissue absorbing a gas will be ____% saturated with that gas
- A. 50

- B. 75
- C. 87.5
- D. 98.6

13. An M-Value is:

- A. The maximum amount of nitrogen that can be dissolved in a tissue.
- B. The maximum change in pressure without a danger of DCS
- C. The maximum amount of oxygen that can be dissolved in the blood
- D. The minimum amount of oxygen required in the blood

14. A diver team does a dive to 110 fsw for 14 minutes. They make a second dive to 90 fsw for 15 minutes after a 2 hour and 30 minute surface interval. What is their ending group?

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Physics

1. At a depth of ____ feet in sea water, the partial pressure of oxygen in air is 1.6 atmospheres.
 - a. 66
 - b. 165
 - c. 218
 - d. 297
2. The volume of a 10 quart flexible container that is submerged to a depth of 99 feet in the ocean is ____ quarts.
 - a. 10
 - b. 5
 - c. $3 \frac{1}{3}$
 - d. $2 \frac{1}{2}$
3. A balloon filled with air has a volume of six cubic inches at a depth of 99 feet in the ocean. What is the volume of the balloon at a depth of 66 feet?
 - a. 6 cubic inches
 - b. 8 cubic inches
 - c. 12 cubic inches
 - d. 24 cubic inches
4. According to Archimedes' Principle, it is the ____ of the displaced fluid that forms the upward force on an immersed object.
 - a. Volume
 - b. Weight
 - c. Density
 - d. Buoyancy
5. The difference in weight between two cubic feet of fresh water and the same volume of salt water is ____ pounds.
 - a. 1.6
 - b. 2.4
 - c. 3.2
 - d. 5.6
6. If a tank contains 71.2 cubic feet of air at a pressure of 2475 psig, approximately ____ feet of air remain at 2250 psig if the temperature remains constant.
 - a. 70
 - b. 68
 - c. 65
 - d. 62
7. According ____ law, twice as much nitrogen would be absorbed into the blood at a depth of 33 feet as would be absorbed at the surface.
 - a. Dalton's
 - b. Boyle's
 - c. Charles'
 - d. Henry's

8. If the temperature of an 80 cu. ft. scuba cylinder filled to 3,000 psi is increased from 70 degrees F. to 150 degrees F., the pressure in the tank will increase by about ____ psi.
- 160
 - 400
 - 480
 - 520
9. Breathing air constantly 1% carbon monoxide at a depth of 132 feet in the ocean is equivalent to breathing air at the surface containing ____% carbon monoxide.
- One
 - Two
 - Four
 - Five
10. The gauge pressure at a depth of 59 feet in fresh water is ____PSIG and the absolute pressure is ____PSIA.
- 25.49, 40.19
 - 26.26, 40.96
 - 40.19, 25.49
 - 40.96, 26.26

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Environment

1. The distance between successive wave crests or troughs is known as:
 - a. Wavelength
 - b. Wave period
 - c. Wave sets
 - d. Swell period
2. The movement of water from the backrush of wave breaking on a beach extends to a depth of about:
 - a. 1 foot
 - b. 3 feet
 - c. 6 feet
 - d. the height of the breaking wave
3. The type of breaking waves that break with the most force are:
 - a. Spilling breakers
 - b. Plunging breakers
 - c. Collapsing breakers
 - d. Surging breakers
4. The effect of the moon on the tides is about:
 - a. The same as the effect of the sun
 - b. Equal to the effect of the sun
 - c. Half the effect of the sun
 - d. Twice the effect of the sun
5. The highest tides are called ____ tides, and the lowest tides are called ____ tides.
 - a. Neap, spring
 - b. Spring, neap
 - c. Spring, diurnal
 - d. Diurnal, semi-diurnal
6. When water rocks back and forth in a lake or a bay, the condition is known as:
 - a. Upwelling
 - b. Seiching
 - c. Surf beat
 - d. None of the above
7. When waves break on shore and the backrush is funneled through a narrow opening, the condition is known as:
 - a. Coriolis effect
 - b. A feeder zone
 - c. Undertow
 - d. A rip current
8. Currents in bodies of water are formed by:
 - a. Surface winds
 - b. Sun and moon influence
 - c. The spin of the earth
 - d. All of the above

9. Water of equal temperature at all levels (Isotherm) is most likely to be found in a lake during the:
- Late spring
 - Summer
 - Fall
 - Winter
10. The horizontal boundary between waters of differing salinity is known as a:
- Thermocline
 - Halocline
 - Salinocline
 - Reverse thermocline

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Dive Planning and safety

1. Which of the following is not considered a part of dive planning?
 - a. Dive site assessment
 - b. Buddy check
 - c. Review of emergency procedures
 - d. All of the above are parts of dive planning
2. Five pulls of five squeezes as diving signals means:
 - a. Come here, help
 - b. Buddy check
 - c. Review of emergency procedures
 - d. All of the above are parts of dive planning
3. A square blue flag with a white square in the middle is:
 - a. The international “alpha” dive flag
 - b. The international recreational diver flag
 - c. Small craft warning signal
 - d. The diver recall flag
4. A dive light waved in a circular motion signals:
 - a. Ok
 - b. Distress
 - c. Attention
 - d. A and C but not B
5. The ideal buddy system consists of:
 - a. Two divers side by side
 - b. Three divers abreast of each other
 - c. One diver following another diver
 - d. One diver above and behind another diver
6. The most desirable ascent procedure for any situation for an out-of-air emergency is:
 - a. A redundant scuba system
 - b. Rebreathing air from a BC
 - c. An emergency swimming ascent
 - d. Use of a buddy’s extra second stage
7. Refresher training is recommended for a lapse of diving activity in excess of:
 - a. Three months
 - b. Six months
 - c. One year
 - d. Two years
8. The turn-around time for a dive team should be determined primarily by:
 - a. The highest air consumption rate
 - b. The no-decompression limits
 - c. A strong wind
 - d. Depth in excess of 60 feet
9. It is recommended that night dives be made:

- a. At familiar sites
 - b. Under favorable diving conditions
 - c. From a boat
 - d. All of the above
10. Which of the following problems is most significant for a diver at night?
- a. Buddy separation
 - b. Judging the rate of ascent
 - c. Disorientation
 - d. Hazardous marine life
11. Dive lights with rechargeable batteries produce light longer than non-rechargeable.
- a. True
 - b. False
12. If you are operating a power boat and a sail boat is crossing from your left and a power boat is approaching from your right:
- a. The sail boat has the right of way, but the other power boat does not
 - b. The other power boat has the right of way, but the sail boat does not
 - c. Both of the other vessels have the right of way
 - d. You have the right of way if yours is the largest vessel
13. Upon completion of the NAUI Master Diver course, you are qualified to enroll in:
- a. Any NAUI specialty diver course
 - b. The NAUI Instructor training course
 - c. The NAUI Assistant Instructor course
 - d. A or C, but not B
14. The best way to avoid injury when diving in an unknown area is to:
- a. Wear protective clothing
 - b. Avoid contact with unknown forms of underwater life
 - c. Get a formal orientation from a diving professional
 - d. Avoid feeding or molesting predators
15. Select the most accurate phrase
- a. You and your buddy are equally responsible for each others safety.
 - b. You and your buddy are also responsible for the safety of other divers in the group.
 - c. Only you are responsible for your dive safety
 - d. The diver with the highest certification is always responsible for the safety of other divers.

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Navigation/ Deep Diving/ Night Diving

1. The most accurate method of measuring distance underwater is:
 - a. Kick cycles
 - b. Measured line
 - c. Timed swims
 - d. Arm spans
2. The angular direction to an object expressed in degrees is called a:
 - a. Heading
 - b. Bearing
 - c. Course
 - d. Fix
3. Metal or magnetic fields near a compass can cause:
 - a. Variation
 - b. Deviation
 - c. Inclination
 - d. Declination
4. The execution of a search pattern underwater is most likely to be successful if it is:
 - a. Practiced beforehand on dry land
 - b. Visualized continuously in the mind
 - c. Discussed with a buddy
 - d. All of the above
5. A knot used to form a temporary loop at the end of a line is a:
 - a. Bowline
 - b. Double sheetbend
 - c. Figure eight
 - d. Anchor bend
6. Which of the following skills is more important when night diving than for diving during daylight hours?
 - a. Sharing air
 - b. Buoyancy control
 - c. Surface swimming
 - d. Underwater navigation
7. Deep diving for recreational dives is considered:
 - a. Dives to depths greater than 60 feet
 - b. Dives to depths of 60 to 130 feet
 - c. Dives to depths greater than 130 feet
 - d. Dives beyond 60 feet and requiring decompression
8. The minimum equipment for deep diving includes:
 - a. One depth gauge and one timing device per dive team
 - b. One depth gauge and one timing device per diver
 - c. Two depth gauges and two timing devices per diver
 - d. One depth gauge, one timing device and one light per dive
9. Which of the following poses the most serious hazard for deep diving?

- a. Nitrogen narcosis
 - b. Greater buoyancy fluctuation
 - c. Increased stress
 - d. Diver ego
10. Which of the following activities are permissible following deep dives?
- a. Hot showers or baths
 - b. Drinking alcoholic beverages
 - c. Mild to moderate exercise
 - d. None of the above
11. A dive light waved in a circular motion signals:
- a. Ok
 - b. Distress
 - c. Attention
 - d. A and C, but not B
12. Oxygen becomes toxic when breathed in concentrations where its partial pressure approaches ____ atmosphere(s).
- a. 1.0
 - b. 1.6
 - c. .80
 - d. 2.1
13. The procedure for an omitted decompression stop include;
- a. Administer pure oxygen
 - b. Give fluids if conscious
 - c. Watch for signs for DCS.
 - d. All of the above
14. The rule of thirds states
- a. 1/3 of air for descent, 1/3 for bottom, 1/3 for ascent
 - b. never spend more than 1/3 of bottom time at deepest depth
 - c. 1/3 of air for ascent and descent, and 2/3 for bottom time
 - d. Use 1/3 of air out, 1/3 back, and hold 1/3 in reserve
15. When night diving entries and exits should be:
- a. Well known by all divers
 - b. Marked with two inline lights or beacons
 - c. Well lighted so all divers can see
 - d. Have stairs for easy entry and exit

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SAC/ Lifts/ Buoyancy

1. A diver with an 80 cu. ft., 3000 psi cylinder uses one-third of his air in 15 minutes at a constant depth of 75 in sea water. His/ Her Surface Air Consumption rate in psi/ minute is:
 - a. 61.2
 - b. 40.8
 - c. 20.4
 - d. none of the above

2. An air consumption rate of 30 psi per minute using a 3000 psi 80 cubic foot cylinder is equal to _____ cubic feet per minute.
 - a. 61.2
 - b. 40.8
 - c. 20.4
 - d. none of the above

3. If a diver has a Surface Air Consumption rate of 30 psi/min. with an 80 cu. ft. tank, the same tank filled to 3000 psi will last approximately _____ minutes at a depth of 100 feet if the diver begins ascending with 500 psi of air in the tank.
 - a. 21
 - b. 25
 - c. 28
 - d. 33

4. A neutrally weighted ocean diver and his equipment weigh 1760 pounds. This diver will need to _____ pounds of weight to be neutrally buoyant in fresh water.
 - a. Add about four
 - b. Subtract about four
 - c. Add about five
 - d. Subtract about five

5. How many 50 pound lift bags are needed to lift a three cubic foot object with a dry weight of 287 pounds from a depth of 102 feet in fresh water?
 - a. One
 - b. Two
 - c. Three
 - d. Four

6. The amount of weight a diver should wear:
 - a. Is 3% less for fresh water diving
 - b. Is the amount required to hover at 15 feet at the end of a dive
 - c. Is the amount required to sink after exhalation with an empty BCD
 - d. Can be any amount as long as you can achieve neutral buoyancy

7. The preferred method to overcome the suction of an object embedded in the bottom is by means of:
 - a. Multiple lift bags
 - b. A tidal winch
 - c. A surface winch
 - d. An underwater dredge
8. The lifting capacity of lifting devices used for salvage should:
 - a. Slightly exceed the weight of the object being salvaged
 - b. Have lift at least two times greater than the weight of the object being salvaged
 - c. Have lift at least 10 times greater than the weight of the object being salvaged
 - d. None of the above
9. In the ocean, how many eight gallon lift bags will be required to lift a 225 pound outboard motor with a volume of one and one-half cubic feet? (The bags are neutrally buoyant when deflated. One gallon of water weighs 8.5 pounds.)
 - a. Two lift bags
 - b. Three lift bags
 - c. Four lift bags
 - d. Five left bags
10. If a diver wants to do a dive to 60 feet sea water what state of buoyancy will best allow him to do this?
 - a. Positive
 - b. Negative
 - c. Neutral
 - d. Any state is acceptable

EMERGENCY PROCEDURES POP QUIZ

QUESTION: You and your buddy are scuba diving and come across an unconscious diver on the bottom. List the procedures for rescuing this victim include what procedures should be done until EMS arrives.

You have the following resources:

1. First Aid Kit
2. Black board
3. Blanket
4. Oxygen Unit
5. Phone
6. There are six people watching the rescue.
7. You just finished a first aid CPR course last weekend.

THE ABYSS QUIZ

1. How deep is the Submersible Drilling Platform in the beginning of the movie?
2. What is that in psi absolute?
3. How deep is the submarine?
4. What is that in psi gauge?
5. What is the code name of the Navy operation?
6. What is the name of the hurricane?
7. What should hurricanes be named after?
8. Is luck a factor?
9. What is HPNS?
10. Who suffers from it? (Name)
11. What happens to Jammer? Why?
12. What is the scientific name for the Navy Breathing Fluid?
13. Who tries it first in the movie and what is its name?
14. Why is this not possible in today's world...yet?
15. Give your opinion as to why Lindsey survives her drowning.

