PADI Instructor Examination
Written Final Exams Study Guidelines

Use the guidelines in this document to help you prepare for the following written Final Exams administered at all PADI Instructor Examinations (IEs):

- Skills And Environment
- Equipment
- Recreational Dive Planner

1. Review academic diving information presented in the following PADI manuals and books. Be sure you've mastered the academic objectives in each of the diver manuals:
   a. PADI Open Water Diver Manual
   b. Adventures in Diving
   c. PADI Rescue Diver Manual
   d. PADI Divemaster Manual
   e. The Encyclopedia of Recreational Diving
   f. Diving Knowledge Workbook
   g. The Wheel Instructions for Use Booklet

   If these books are not available (or they do not exist in your primary language), other diving texts with detailed, elaborated academic diving information may be used.

2. Complete the PADI quizzes and final exams for each of the following courses: Open Water Diver, Rescue Diver and Divemaster. On these exams, be able to identify the correct answer for each question. If the question is multiple choice, you must also be able to explain why the other choices are incorrect.

3. Complete the PADI Instructor Preassessment Exam in the Instructor Candidate Workbook. Your performance on this exam is a general indicator of your knowledge of diving theory and information. Concentrate your study efforts in the areas of weakness indicated by the preassessment exam.

NOTE: As with any preassessment document, successful mastery does not ensure success with the actual IE exams. At the IE you are expected to have a thorough (instructor-level) knowledge of critical diving information and concepts.

4. Questions on all PADI exams are criterion-referenced, meaning they relate directly to one or more performance objectives. Because these performance objectives are the basis on which PADI materials are written, the correct responses to all questions can be found within PADI materials.

   The following list of objectives were used to construct the IE written Final Exams. As a result, a thorough understanding of these objectives provide you with a solid foundation of knowledge for taking the exam. You must do more, however, than simply memorize responses to the objectives — you must be able to solve never-before-encountered problems and identify specific applications of the concepts involved.

   The objectives are listed according to exam topic. Page references are noted in brackets. Unless otherwise noted, these page references are for The Encyclopedia of Recreational Diving. The pages indicate where you may find material dealing with the objective in question.

NOTE: Although The Encyclopedia of Recreational Diving is a convenient assembly of academic diving knowledge, information on each objective can be obtained from other diving manuals and texts in various languages.

A. Skills And Environment
   A PADI Instructor must be able to:
   1. State the maximum altitude above which special procedures are required for the use of most dive tables, and explain why diving at altitude requires special consideration. [2-28] (Also see p. 226 of the PADI Open Water Diver Manual.)
   2. Explain how tides are caused and why diving conditions are usually best at slack tide. [4-13 to 4-15] (Also see p. 140 of the PADI Open Water Diver Manual.)
   3. Define the term environmental orientation, explain for whom such an orientation is intended and state which PADI Experience program offers an orientation. [PADI Open Water Diver Manual pp. 249-250]
   4. Explain the proper procedure for executing a Controlled Emergency Swimming Ascent. [PADI Open Water Diver Manual. pp. 165-166]
   5. Define the term neutral buoyancy and describe how to execute a buoyancy check at the surface. [PADI Open Water Diver Manual p. 65, 115-116]
   6. Demonstrate the thirteen PADI Standard Hand Signals and explain the meaning of each. [PADI Open Water Diver Manual pp. 101-104]
   7. Explain what action should be taken with a victim of a near-drowning accident. [2-11] (Also see PADI Rescue Diver Manual pp. 60-61.)
   8. List at least three common signs/symptoms of marine life injuries. [4-69] (Also see PADI Rescue Diver Manual pp. 57-59.)
   9. Explain why an unconscious, non-breathing diver should be resuscitated while being towed to shore even if no pulse is suspected. [PADI Rescue Diver Manual p. 161]
   10. Explain what action should be taken for a diver suffering from decompression sickness, and under what circumstances the victim should be taken back into the water for recompression. [2-37] (Also see PADI Rescue Diver Manual pp. 63-68.)
   12. Given the nature of the circulation of major ocean currents (Coriolis effect), state the direction of flow for such currents in relation to the coastline of any continent. [4-11 to 4-12]
   13. State the guideline for the recovery of a negatively buoyant object without the assistance of a lift bag. [Adventures in Diving p. 195.]
14. List the minimum suggested equipment necessary to safely engage in night diving activities. (Also see Adventures in Diving p. 33.)

15. State the most accurate means of measuring distance under water without the use of a calibrated measuring device. [Adventures in Diving pp. 4-6]

16. List at least two factors that dictate the type of pattern to be used when searching for an underwater object. [Adventures in Diving p. 185-187]

17. List at least three guidelines divers should follow to help protect the marine environment. [4-67 to 4-68] (Also see Adventures in Diving pp. 214-215)

18. State the diving skill most useful in avoiding damage to the marine environment. [4-67 to 4-71] (Also see PADI Open Water Diver Manual pp. 7, 219-220.)

B. Physics

A PADI Instructor must be able to:

1. Explain why water is able to dissipate body heat faster than air, at what rate this occurs and what effect this has on the diver. [1-11 to 1-12] (Also see PADI Open Water Diver Manual pp. 79-87.)

2. Explain the behavior of light as it passes from an air/water interface and what effect this has on the diver. [1-13 to 1-17] (Also see PADI Open Water Diver Manual pp. 70-71.)

3. Define the visual reversal phenomenon and explain its effect on the diver. [1-16]

4. Explain why sound travels faster in water than in air, by approximately how much and what effect this has on the diver. [1-18 to 1-19] (also see PADI Open Water Diver Manual p. 72.)

5. State Archimedes’ Principle and calculate the buoyancy required to either lift or sink an object in both fresh- and seawater. [1-20 to 1-22]

6. Define the terms absolute, ambient and gauge pressures and calculate the pressure at any depth as expressed by these terms in both fresh- and seawater. [1-24]

7. Explain the relationship between pressure and volume on a flexible gas-filled container, and calculate (in increments of whole atmospheres) the changes that will occur to that container as it is raised and lowered in the water column. [1-32 to 1-35]

8. Explain the relationship between depth and the density of the air a diver breathes, and calculate this relationship in increments of whole atmospheres. [1-34]

9. Given a diver’s air consumption rate at one depth, calculate (in increments of whole atmospheres) how that consumption rate changes with depth. [1-34]

10. Describe how the behavior of a gas within both a flexible and inflexible container is affected by changes in pressure and temperature. [1-35 to 1-37]

11. Given their percentages, calculate the partial pressure of gases in a mixture at any depth. [1-38 to 1-41]

12. Explain the effect of breathing contaminated air mixtures at depth, and calculate the equivalent effect such contamination would have upon the diver at the surface. [1-40]

13. Explain what will occur to a gas saturated at high pressure when the pressure on gas in contact with the liquid is quickly reduced. [1-41 to 1-45]

14. Define supersaturation and explain what conditions are necessary for gas bubbles to form in a super-saturated liquid. [1-45]

C. Physiology

A PADI Instructor must be able to:

1. Name the substance within the blood that aids in the transport of oxygen. [2-3 to 2-4]

2. Explain how proper diving techniques and equipment can help avoid exhaustion and excessive buildup of carbon dioxide. [2-8 to 2-9]

3. Explain the physiological mechanism by which voluntary hyperventilation enables a diver to extend breath-holding time. [2-10]

4. Explain the physiological mechanism that causes a carotid sinus reflex, and how this affects the diver. [2-12]

5. Explain the physiological mechanism that causes a shallow water blackout and why this condition usually occurs during ascent rather than descent. [2-14]

6. Explain the physiological effect of increased carbon monoxide levels (including cigarette smoking) on the diver and how it can be avoided. [2-14 to 2-15]

7. Define the term silent bubbles as it relates to decompression sickness. [2-21 to 2-22]

8. Explain why victims of decompression sickness are given pure oxygen as a first aid measure. [2-36 to 2-37]

9. Explain the cause of nitrogen narcosis, state the approximate depth at which the disorder occurs and list three common signs/symptoms. [2-38 to 2-39]

10. Explain the physiological mechanism of decompression sickness, and list the common susceptibility factors that can contribute to its occurrence. [2-29 to 2-35]

11. Define the term barotrauma, and how it can occur to the lungs, sinuses and ears of the diver during both ascent and descent. [2-45 to 2-57]

12. Define the term vertigo and explain the mechanism by which this normally occurs in the diver. [2-49 to 2-51]

13. Describe the basic anatomy of the ear and which areas/structures are most affected by changing pressures. [2-49 to 2-51]

14. Compare and contrast the various signs/symptoms of decompression sickness and air embolism. [2-36 to 2-37]
15. State the most serious form of lung-expansion injury in diving, how it occurs, and what factors can contribute to its occurrence. [2-56 to 2-57]

D. Equipment
A PADI Instructor must be able to:
1. Explain the meaning of each legally required mark that appears on the neck of a scuba tank including: alloy designation, hydrostatic test date, working pressure, and over-pressurization designation. [3-54]
2. Contrast the differences between steel and aluminum scuba tanks in terms of maximum pressures, thickness and capacity. [3-47 to 3-51]
3. Explain the purpose of a J-valve and how it is designed to work. [3-53]
4. Explain the safety device and design feature that prevents an overpressurized scuba tank from exploding. [3-53]
5. Explain the effect of extreme heat upon the structural integrity of a scuba tank and what should be done in the event tanks are exposed to such conditions. [3-56 to 3-57]
6. Explain how scuba tanks are hydrostatically tested and to what pressures these tests are conducted. [3-56]
7. List at least four reasons a scuba tank should be visually inspected annually. [3-56]
8. Explain the term open-circuit demand regulator and describe what advantages this design has over other types. [3-58]
9. List the major parts and explain the general function of the first and second stage of a scuba regulator. [3-61 to 3-67] (Also see pp. 75-79 of the PADI Rescue Diver Manual, pp. 42-45 of the PADI Open Water Diver Manual.)
10. Define the terms balanced, unbalanced, upstream and downstream as they relate to regulator design. [3-61 to 3-67]
11. Define the term environmental seal and what this feature is designed to prevent. [3-62]
12. Define the term fail-safe as it relates to regulator design and how this feature operates in the event of regulator malfunction. [3-64]
13. Explain the proper procedures for the use of dive computers among buddy teams. [3-84] (Also see p. 228 of the PADI Open Water Diver Manual.)
14. State the type of depth gauge that automatically compensates for high altitude diving. [Adventures in Diving p. 90]
15. List at least three equipment-related reasons why divers should always avoid maximum no decompression limits. [3-76 to 3-83]

E. Recreational Dive Planner
A PADI Instructor must be able to:
1. Explain why the RDP Surface Interval Credit Table is significantly shorter than that of the U.S. Navy tables and why such a difference is possible. [2-32 to 2-33]
2. Explain what is meant by a multi-tissue decompression model and the number of tissues used in the creation of the RDP versus U.S. Navy models. [2-25 to 2-33]
3. When diving above sea level, explain why it is critical to know the altitude at which the dive is to take place. (Adventures in Diving pp. 84-85)
4. Explain why Pressure Groups from one model/table cannot necessarily be transferred to another model/table. (The Wheel Instructions for Use p. 20)
5. Using both The Table and The Wheel formats of the RDP, demonstrate how to find a No-decompression Limit (NDL), and state the procedures for Emergency Decompression and Omitted Decompression. (See Sections Four and Five of the PADI Open Water Diver Manual and Instructions for Use.)
6. Using both The Table and The Wheel formats of the RDP, calculate dive profiles for three or more repetitive dives, demonstrating the correct guidelines and procedures for: determining minimum surface intervals, taking safety stops, and applying the special multiple dive rule (groups W,X,Y & Z). (See Sections Four and Five of the PADI Open Water Diver Manual and Instructions for Use.)
7. State the guidelines for flying after diving and demonstrate the application of the rule for each circumstance addressed. (PADI Open Water Diver Manual p. 226 to 227)
8. Using The Wheel format of the RDP, demonstrate how to calculate a multilevel dive. (Instructions for Use pp. 58-55.)
Recreational Dive Planner

To determine your current ability to solve Recreational Dive Planner calculations, complete this Preassessment Inquiry. Choose the best answer to each question.

1. Residual nitrogen time is the total time in minutes from the beginning of descent until the beginning of final ascent to the surface or safety stop.
   - a. True
   - b. False

2. When using the dive tables, divers must ascend no faster than a rate of ______ feet per minute.
   - a. 6 metres/20 feet
   - b. 18 metres/60 feet
   - c. 12 metres/40 feet
   - d. 24 metres/80 feet

3. A dive to 18 metres/59 feet for 29 minutes yields what pressure group?
   - a. L
   - b. J
   - c. K
   - d. M

4. A diver in pressure group "K" plans a dive to 18 metres/56 feet. What is the maximum allowable bottom time according to the Recreational Dive Planner?
   - a. 26 minutes
   - b. 44 minutes
   - c. 29 minutes
   - d. 16 minutes

5. A diver in pressure group "D" completes a dive to 14 metres/46 feet for 29 minutes. What is his new pressure group upon surfacing?
   - a. T
   - b. P
   - c. O
   - d. U

6. A diver makes a dive to 18 metres/56 feet for 44 minutes. After a one-hour surface interval, he returns to 18 metres/56 feet. Losing track of time, he notices that his bottom time is now 37 minutes. According to the Recreational Dive Planner, what action should he take?
   - a. Surface immediately and contact the nearest recompression chamber.
   - b. Immediately ascend to 5 metres/15 feet and remain there for 3 minutes before surfacing.
   - c. Immediately ascend to 5 metres/15 feet and remain there for 8 minutes before surfacing.
   - d. Ascend to 3 metres/10 feet and remain there until air is exhausted.

7. After completing the dives indicated in question 6, what is the minimum amount of time the diver must wait prior to flying?
   - a. The diver may fly immediately after the dive.
   - b. 12 hours
   - c. An extended time beyond 12 hours
   - d. 4 hours

8. What is the minimum surface interval required to make a dive to 22 metres/80 feet for 23 minutes, followed by a 15 metre/50-foot dive for 47 minutes?
   - a. 23 minutes
   - b. 20 minutes
   - c. 8 minutes
   - d. 15 minutes

9. A divemaster is planning to take a group of advanced divers to two different locations. One is a reef in 16 metres/54 feet of water, and he plans a bottom time of 25 minutes. The second location is on a wreck in 28 metres/95 feet of water, where he plans a bottom time of 20 minutes. The surface interval between the dives will be two hours. In the interest of safety, which dive should the divemaster plan first?
   - a. The order of dives is of no consequence in this example.
   - b. The 16 metre/54-foot dive
   - c. The 28 metre/95-foot dive
   - d. Whichever the group wishes to dive

10. A diver makes a dive to a depth of 19 metres/68 feet for 24 minutes. After a one-hour surface interval, he wishes to return to a depth of 17 metres/58 feet. What is the maximum allowable bottom time for the second dive?
    - a. 14 minutes
    - b. 17 minutes
    - c. 41 minutes
    - d. 63 minutes

Wheel users, answer the following question:

You plan a multilevel dive to begin at a depth of 30 metres/100 feet. You plan to stay at 30 metres/100 feet for 10 minutes, then ascend to 20 metres/67 feet for an additional 15 minutes. What will your pressure group (p.g.) be upon surfacing?

   - a. Pressure Group "O"
   - b. Pressure Group "Q"
   - c. Pressure Group "T"
   - d. Pressure Group "V"

How did you do? 1. False, 2. b, 3. c, 4. a, 5. Metric - c; Imperial - b, 6. c, 7. c, 8. Metric - a; Imperial - d, 9. c, 10. c, Wheel - a.