

The British Sub-Aqua Club

# FIRST CLASS DIVER

**DIVING KNOWLEDGE EXAM    October 2007**

Name:

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Please read the following instructions carefully before you begin answering the questions.

- **Answer all 30 questions.** Write your answers in the spaces on the question paper. Please remember to put your name on the paper.
- Brief answers are possible for most questions. Answer as concisely as possible. Use diagrams where these help your answer or where they are asked for.
- There are 2 marks for each question.
- The time allowed is 60 minutes.
- Write all answers in ink, as clearly as possible.
- You may use a calculator but please show all calculations.
- You will need your own copy of the complete BS-AC'88 Tables, levels 1-4 and BSAC Nitrox Tables. No other reference material of any kind is allowed.
- All questions assume sea water (density 1.025 kg/litre) and the prevailing conditions in the United Kingdom unless otherwise stated.
- Please check your work very carefully. A mistake at an early stage of some questions may result in a series of wrong answers and a loss of marks.

<p><b>Please note that the mark awarded by the examiners for your performance on this paper is final and under no circumstances can the examiners enter into any correspondence or discussion with you regarding this paper.</b></p>
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Medical

1. Why is an AED considered “automated “?
2. Which life threatening heart rhythms may be helped by defibrillation?
3.
  - a) Why would an in-water rescuer be advised to give rescue breaths to an apparently non-breathing casualty even before summoning help?
  - b) Why is it recommended that cardiac compressions be given before rescue breaths in the Basic Life Support Protocol?
4. A rebreather diver accidentally gets Sofnolime dust into their eyes while repacking the scrubber. How do you deal with this?
5. The BSAC Oxygen Administration Course teaches students to administer oxygen to divers for diving related conditions. Which group of people may be harmed by the administration of 100% oxygen and why is this?
6. What particular precautions should be taken when using an AED in diving situations?

Decompression

7. The latest models of diving computers incorporate a heart rate monitor. Why might monitoring of a diver’s heart rate improve the accuracy of a personal diving computer?
8. To how many theoretical tissue compartments do the BSAC ‘88 and Bühlmann ZHL-16 tables refer?
9. How is ‘cavitation’ relevant to decompression?
10. What are tissue half times?
11. How many half times does it take for a tissue to be considered ‘saturated’?
12. What is isobaric counter-diffusion or counter-saturation and what is its relevance to open circuit mixed gas divers?

## Equipment

13. What is the basic difference between an upstream and a downstream regulator?
14. What is a (Jersey) Up Line and how would you use it?
15. Compare 2 advantages and 2 disadvantages of an isolated manifolded versus independent twin set.
16. Give 2 advantages and 2 disadvantages of using a full-face mask.
17. What is an ADV on a closed circuit rebreather?
18. Why should the scrubber canister on a rebreather be rechecked after transport?

## Dive planning and techniques

19. You are managing a diving weekend based in the West of Scotland on two 6m RIB's. Diving is on wrecks between 25-35m in areas affected by tide. The group is quite experienced consisting of six sports divers; two dive leaders and three advanced divers and yourself as a First Class Diver; the whole group are extended range divers on open circuit.

Before boarding the boats on the Saturday morning you give a brief. Write down in bullet form which items you would cover in the brief.

20. Before the RIB leaves for the dive you have to make up a 35m shot-line from two lengths of line. One is 20m and the other is 25m long; neither has spliced loops or carabineers. The shot weight is 25Kg and the buoy is 30 litres and you have a selection of equipment on shore.  
What knots would you employ when making it up?

21. How do you make its use safe before, during and after the dive?

22. On the second dive of the day one of the Sport Divers loses their very expensive underwater SLR camera overboard 1m from the shot line just after slack water. At the current state of the tide the seabed is at 35m, the middle of the wreck where the shot is lodged is at 30m and the shot-line is 35m long. The camera and housing is 0.25Kg negatively buoyant underwater. It is decided that the first dive on Sunday for one of the RIB's, with a compliment of six divers, should be used to recover the camera. What methodology would you employ to undertake the search bearing in mind the original shot was right in the middle of the wreckage?

23. Each pair of diver wants to spend the maximum amount of time under water but come out as quickly as possible. Assuming the slack window is 100 minutes, what would be appropriate gasses for each stage of the dive?

24. What safety measures should be employed bearing in mind the waters are tidal and decompression is being undertaken?

### Weather & Seamanship

25. On a chart you see lights that indicate a safe course to steer through a channel or into a harbour. What are they called and how do they indicate your position relative to them?

26. What appropriate VHF channels should be used for ship-to-ship communications?

27. What are the two common frequencies used on dual band depth sounders and what differentiates them in terms of searching for wrecks?

28. You are entering a sea loch passing under a high bridge. On the bridge you see three symbols; a green triangle off the port bow, a red square off the starboard bow and a red and white striped square right above the bow of the boat. What do they all mean and which way are you travelling?

29. You listen to the 0520 BST on your 23m long liveaboard based in the West of Scotland and hear a Radio 4 weather broadcast: *Northwest 4 or 5, decreasing 3 or 4 later. Moderate or rough. Mainly fair. Mainly good.*

What does this mean and would you be happy send divers out in these conditions assuming the first dive was at 0830 BST?

30. What other vital information follows the main shipping forecast?