



The British Sub-Aqua Club

FIRST CLASS DIVER

DIVING KNOWLEDGE EXAM MARCH 2003

Name:

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.

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.

Decompression

Maggie and Robin are diving on a wreck which is at its shallowest at 34m and the seabed depth is 40m.

7. What is the highest oxygen level in a nitrox mix which would allow them to reach this wreck?

Maggie and Robin dive together and leave the surface at 10.00. Maggie is breathing a mix of Nitrox 28 and Robin is breathing Nitrox 26. Use the BSAC Nitrox tables to answer the following questions.

8. What is the maximum depth and no-stop time that (a) Maggie and (b) Robin could undertake?

9. What dive profile would you suggest that Maggie and Robin carry out assuming that they want to do 10 minutes of decompression stops.

10. What time will they surface from this dive and what are their surfacing codes?

11. Dive computers usually use computer algorithms that are based on “compartments” with differing half-times which are designed to represent the nitrogen uptake and release of different tissues. For the following list of tissues (skin, bowels, central nervous system, joints, fat and muscles) which members of this list would you expect to be represented by:

A “compartment” with a half-time of 10 minutes. Tissue.....

A “compartment” with a half-time of 80 minutes. Tissue.....

A “compartment” with a half-time of 640 minutes. Tissue.....

12. The algorithms used to calculate a diver’s decompression requirements are evolving all the time. Recent changes have been introduced which reduced the occurrence of microbubbles. Briefly explain what microbubbles are and how are they involved in the formation of decompression illness.

Equipment

13. List FOUR markings you would expect to find on the side of a diving cylinder

14. With the aid of a simple diagram show the mechanism which allows a submersible high pressure gauge to rotate on the end of the high pressure hose without leaking gas.

15. What is the difference between an upstream and downstream valve?
16. Briefly describe the checks you would carry out on your diving regulator prior to going diving.
17. What are the current regulations for a Periodic Inspection and Test for diving cylinders?
18. What gases would you expect to find in a TRIMIX breathing system.

Dive planning and techniques

During a drift dive, a pair of divers discover a bronze cannon. After looking at it, they immediately ascend from the cannon (depth 36m) using the ascent rate recommended in the BSAC Level 1 – 4 Tables. No stops were required. On surfacing, they immediately take two sets of transits. The boat cover then drops a marker buoy on the transits taken. During the dive the tide was running in a northerly direction. Answer the following questions based on this scenario.

19. Where would you expect the cannon to lie relative to the buoy and transits? (Give a direction and accurate distance). (Show your working)
20. The boat drops a second buoy in the position you calculated in (19). Using a sketch, describe how you would conduct a circular search for the cannon. (Assume that you carry this out later at slack water).
21. Having refound the cannon, describe how you would obtain an accurate position for the cannon, and conduct a 5m x 5m survey of the seabed around the cannon.

22. For your survey, described in (21), suggest what would be the best breathing gas for your divers to use and suggest suitable dive time for the divers (using the BSAC Tables) which ensures that they do not exceed 15 minutes of decompression stops
23. If the cannon weights 60Kg and your lifting bag weighs 2 Kg, how many litres of air would you need to take down with you to lift the cannon. (Show your working).
24. After the discovery of the cannon, who would you inform about the cannon and its location to remain within the law and to ensure that, if site is of potential archaeological interest, it can be surveyed properly..

Weather & Seamanship

25. Describe briefly the type of anchor you would use in a small boat such as a RIB and how you would set it up in the boat.

26. Name three knots which can be used to join two ropes together.
27. In the event of a diving or boating accident at sea, who should you contact and what information would you provide.
28. Describe what a NAVTEX system is and what information does it provide.
29. Make a simple sketch showing the weather conditions you would expect if a warm front followed by a cold front passed over you.
30. The terms IMMIDENT, SOON and LATER, as used on weather forecasts, refer to specific times. What are these?

IMMIDENT..... SOON..... LATER.....