



The British Sub-Aqua Club

FIRST CLASS DIVER

DIVING KNOWLEDGE EXAM March 2004

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.

3. Describe the difference between a constant flow mask and a demand mask on an oxygen administration set? What percentage of oxygen would each administer to the casualty and when would you use them.

4. Draw a diagram to explain why objects appear larger under water. Order these colours in the order that they are absorbed as you descend. Yellow, Red, Blue, Orange, Green.

5. Draw a simple diagram to show where the major sinuses are in the head?
Can you name them?

6. Would you give oxygen to a casualty who had shown symptoms of CNS oxygen toxicity? Explain your answer.

7. Explain what advice you would give a BSAC diver who has recently become diabetic.

Decompression

8. Why does using a high oxygen decompression mix reduce the amount of required decompression?

9. List what should the decompressing diver do to minimise the risk of DCI whilst carrying out lengthy decompression stops?

10. What are 'deep stops' and why do some divers perform them?

11. What are the risks of decompressing for extended periods on high oxygen percentage decompression gases? What precautions can be taken to minimise these risks?

12. What procedure would a decompressing diver follow to indicate to the surface cover that more gas is required?

Equipment

13. What function(s) does a GMDSS system perform in a distress situation over and above that of a basic VHF radio system?

14. Explain 'voting logic' in Closed Circuit rebreathers.

15. You need to raise a steel object approximating a volume of 0.005 m^3 (Density 8000 kg/m^3) from 40m. How much air is needed to lift the object?
Draw a diagram, labelling the size of lifting bag(s), of how you would set up this lifting exercise.

16. Explain why it is not recommended for nitrox cylinders to be filled to 300 bar.

17. Which knot would you use

a) for a roped diver?

b) to fix a line to a shot?

c) to tie your RIB to a ring on a harbour wall?

18. How should a trimix diving cylinder be marked and how often should it be tested?

Dive planning and techniques

Scott, Jane, Simon, John, Maggie and Laurent are on a diving expedition to Tory Island, an exposed island off North-West Ireland. Martin and Simon are closed circuit rebreather divers, Maggie and Laurent are diving semi-closed rebreathers and John and Jane are diving open circuit twin 12 litre cylinders filled with Air.

19. On a 40m wreck dive, each having the same dive time and using dive computers designed to suit each method of diving, which dive pair would you expect to have the least required decompression time and why?

20. And which pair would you expect to have most required decompression time and why?

21. Draw the set up of a decompression trapeze that could be used by these divers

22. If you were using a decompression trapeze what order you would put these pairs in the water?

23. John and Jane have decided instead to use BSAC 88 air tables to dive and they are hesitating about carrying an additional 3 litre pony of 50% Nitrox. What advice on the carrying of the nitrox would you give them?

24. What surface detection aids would you advise your divers to carry on this expedition?

25. You are planning to navigate to a wreck 15 nautical miles from the harbour in a RIB capable of 25 knots? On a chart you measure the heading as 94° . The compass rose indicates that the variation is $5^\circ 20' W$ 1993 ($5'E$). What is your planned heading and how long would it take you to get there?

26. What symbols would you find on meteorological chart to show

a) warm front?

b) cold front?

c) occluded front?

27. What conditions cause the generation of a sea breeze?

28. Away on a hard boat, your echo sounder has broken and you have arrived in a small harbour for the night. You want to moor in an area that will ensure your boat does not bottom out over night. The draught of your vessel is 2.1m and when you use a weight and line the depth of the water is 5 m, it is 18.00. The harbour master tells you that the tide details for a nearby port are High Water 16.00 4.2m and LW 22.00 1.2m. Are you safe where you are? Show your working.

29. Draw an isolated danger mark? What lights would you find on this mark at night?

30. You have divers down and are displaying a large 'A' flag, despite this a large yacht is speeding directly towards your divers. You have a horn on board, what signal would you give them? What other action would you take?