The British Sub-Aqua Club

FIRST CLASS DIVER

DIVING KNOWLEDGE EXAM: Mar 2015

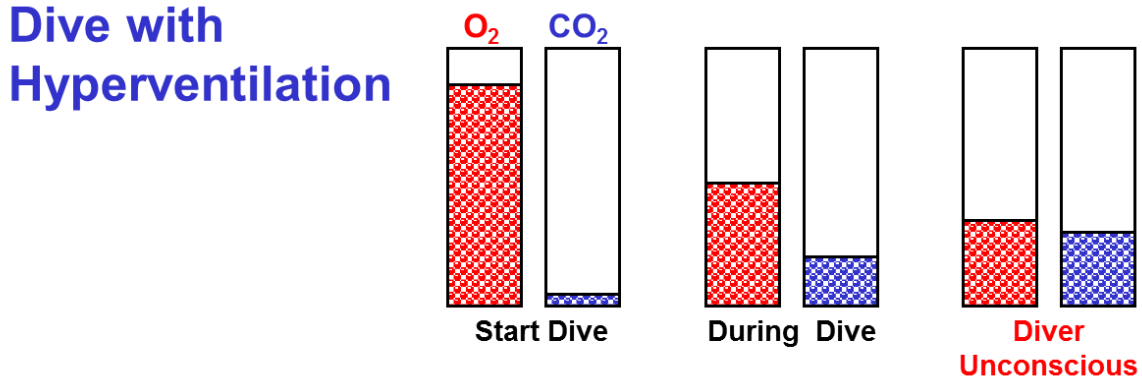
ANSWER GUIDELINES

Please note that the answers provided here are for guidance only. The nature of the examination means that for some questions there may be other 'correct answers'.

MEDICAL

1. Treat as head injury. Dress wound. Monitor casualty – check level of consciousness. . Drive to hospital – ensure two people accompany casualty, one to drive and other to tend the casualty. Be prepared for vomiting and worsening of condition.

2. Extract from OT3.



3. Middle Ear, Lungs, Gut, Sinuses, Airways

4. Oxygen 17%, 4% Carbon, 79% Nitrogen

5. Call a diving doctor (for example, DDRC or Aberdeen Hyperbaric Centre for Scotland) and get a second opinion. Put them in touch with the local doctor. Follow instructions of diving doctor.

6. **Dry air** in SCUBA tanks, **Immersion diuresis** as a result of negative pressure breathing, **Cold** causes vasoconstriction at peripheries driving fluid to core and stimulating diuresis, hypercarbia (higher blood carbon dioxide). Question relates to diuresis as a result of diving so diuretics such as alcohol, coffee, tea are not an appropriate answer as they contribute to pre-dive dehydration.

7. Plan for bailing out at the at the point of maximum gas loading (i.e. at start of ascent), ensure you have enough bailout gas, ensure buddy and dive team understand any relevant bailout signals and have spare gas standing by, have a written bailout decompression plan.

8. RMV can peak at 70LPM, use 50LPM for calculations to first deco stop.
Average depth=35m, absolute pressure = 4.5 bar
Gas used = 4.5 x 50 x 3 = 675litres

9. Similar algorithms or computer model used, similar gases and settings used in the calculations. Back up plan more conservative than main plan.

10: What? Buoyancy will gradually increase.
Why? He will off gas into his counter lung.
Action?: Periodically vent his counter lung.

11. Isobaric Counter Diffusion occurs where one inert gas enters a tissue faster than another can leave it, potentially causing the tissue tension to rise above the critical supersaturation level where bubbles form. For recreation divers it can be a problem with dives at around 80m

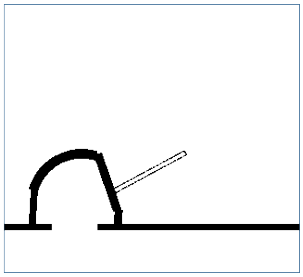
12. Use BSAC Ox-Stop tables: 1min @ 9m, 4 mins at 6m. 1 min at 9m, 4+7 = 11mins @6m.

13. Advantage: Hands free critical information.
Disadvantage: Relies on optics and therefore may not worth with bi-focal mask or people with vision in only one eye.

14. Advantages: Large amount of nitrox for accelerated decompression, Can swop out bottles between dives unlike man folded twinset Disadvantages: Lack of redundancy of bottom gas, Need to manage which gas breathed to avoid diver (during normal dive) or their buddy using the wrong gas in an emergency.

15. a) Side Scan Sonar b) Multi-beam sonar c) Magnetometer

16. Answer to show the twin traces of the seabed and wreck where the beam overlaps and the outline of the wreck plus a faint trace for the mast.



17. See BSAC guidance “Towing and the Law”. Correct license, Trailer with correct size limits, Trailer and vehicle within Maximum Authorised Mass

18. See APD CO2 Sensor Manual (available online). Basically detects changes to wavelength of infrared light and uses a complex algorithm to determine CO2 level. A drying cartride is fitted to prevent moisture giving false readings. The alarm is set to 5mbar.

19. Tidal range = 3.2m. Dive is approx. 4 hours after HW so it will have dropped by 1+2+3+3=9/12 = ¾ x 3.2 = 2.4m. Height = 4-2.4 = 1.6m.

20. For transporting charged diving cylinders. Most ferry companies insist that these should be completed. Approach the ferry company well in advance of your planned journey and ensure you have completed the documentation correctly.

21. MCZs (Marine Conservation Zone) have the potential to conserve or enhance the status of endangered species or marine habitats. They aim to improve the health of our local seas and should, and as a result, enhance our diving experience. Divers are among a minority of sea users that actually observe the underwater realm. However MCZ protection measures also have the potential to impact on us through, for example, restrictions on access, anchoring or the recreational take of marine life.

22. Extract from Safe Diving: Additionally, technical diving involves planning for the various combinations of gas mixtures to be used at different depths and also accounting for loss of gas mix scenarios . This requires a very disciplined diver to both plan and then execute the dive as planned . The technical dive plan should consider: • The 100 metre depth limit • Manufacturers' equipment specific depth limit recommendations • The MOD (maximum operating depth) of the gases being used • END (Equivalent narcotic depth) When boat dives are taking place, divers should make sure that a responsible person on shore has details of the dive plan and estimated time of return .

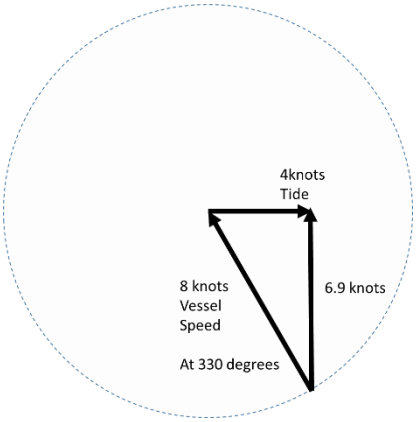
23. See Legislation. If you dive for money or reward, even using recreational techniques and equipment, you are considered to be a professional diver and are subject to the requirements of the Diving at Work Regulations 1997. Amateur divers must be aware that any job of work carried out for anything other than essential expenses e .g . petrol or air costs, would be considered subject to the requirements of the regulations . It does not matter whether the money or gifts are presented to the divers or their branch, this would still be seen by the HSE as diving at work . Even jobs of work undertaken for true expenses are seen by professional divers as 'stealing their work' and will often be a source of aggravation.

24. Passport, Travel insurance for the diving you plan to undertake, Qualification Cards/Logbooks, Completed Diving Medical Forms (if self declarations are not valid), Local dive permits.

25. Problem can be solved graphically or by trigonometry for the more mathematically inclined.

Heading = 330 degrees.

Time taken to cross
= 1NM/6.9NM per HOUR * 60minutes = 8.7 minutes.

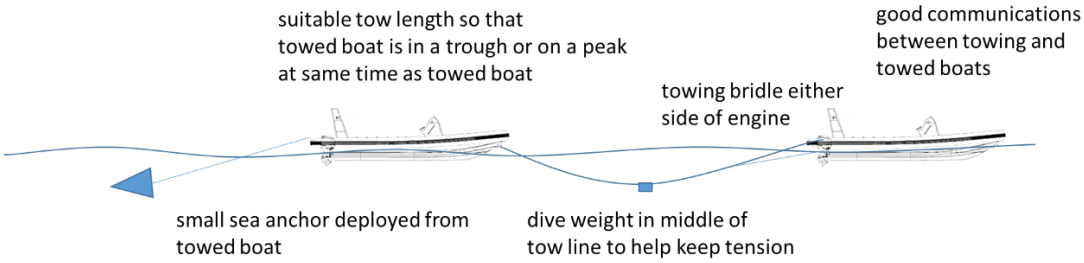


26. Strong North/North Westerly Winds, Rough, Rain. Diving offshore unlikely. Possible only very near to sheltered shores.

27. If you stand with your back to the wind, the low pressure area will be on your left in the northern hemisphere.

28. CQR: Mud, Danforth: Sand, Bruce: Mud, Folding Grapnel: Boulders. See p57 of BSAC Seamanship, A Guide for Divers.

29.



30. See page 155 of BSAC Seamanship for divers. As the land is heated by the sun the air above it started to rise causing an area of low pressure. Air is drawing in off the sea to replace the air lost. A return flow sets up aloft to complete the cycle.