

The British Sub-Aqua Club

FIRST CLASS DIVER

DIVING KNOWLEDGE EXAM: Sat 6th October 2018 10:30am

Name: _____

Membership No: _____

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
- You are allowed 15 minutes to read the paper and plan how to answer it.
- You are allowed 60 minutes for writing your answers
- 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 and BSAC Ox-Stop Tables. No other reference material of any kind is allowed.
- You will need chart work instruments (i.e. Breton plotter or parallel rules, pencil, compass).
- 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.

MEDICAL

1. One of your divers has been stung on the face by a lion's mane jellyfish (*cyanea capillata*), list two treatments that may relieve the pain.

a) _____

b) _____

2. Briefly explain what Hypocapnia means and list one reason why it usually occurs.

a) _____

b) _____

3. List four types of shock and their causes.

a) _____

b) _____

c) _____

d) _____

4. If a casualty suffers a pneumothorax, what type of shock are they likely to suffer and what would cause this.

a) _____

b) _____

5. A casualty has a bad cut on their forearm which contains foreign materials making the application of direct pressure to the wounded area impossible.
List two steps that should be taken to reduce blood loss through the wound.
What quantity of blood loss in litre could result in requiring transfusion.

a) _____

b) _____

c) _____ litres

6. A diver in full SCUBA equipment falls while walking down a sloping path into the water and breaks their arm. They are conscious and talking and are floating on the surface of the water. List the steps you would take to get the casualty on to dry land.

a) _____

b) _____

c) _____

d) _____

DECOMPRESSION

7. John Haldane introduced the concept of half times to model the uptake and release of nitrogen in the tissue compartments, can you explain what is meant by half times, what number of half times are required to saturate the tissue compartment.

a) _____

b) _____

8. You plan a dive on using the ox-stop tables assuming you have not dived for 48hrs. You plan to dive to 32mtrs for 52minutes, using 27% bottom gas and 80% decompression gas. When you arrive at your first stop you realise that you have no decompression gas.

What stops will you have to do and what is your total surfacing time. (show calculations)

a) _____

b) _____ Surfacing Time

9. Calculate the CNS and UPTD's for the above dive.

a) _____

b) _____

10. What is Isobaric inert gas counter diffusion (ICD) and where in the body would this typically manifest as decompression symptom.

a) _____

b) _____

11. Tissues are said to on-gas and off-gas at different rates, describe the on-gassing process. Can you name three fast tissues.

a) _____

b) _____

c) _____

d) _____

12. A diver suffers from DCI (the bends) after his dive, his dive profile was good with no issues. When quizzed about his dive, he did a lot of heavy lifting after the dive. What medical condition mostly likely caused the DCI (bend). How do you test him to prove what caused the DCI (bend).

a) _____

b) _____

EQUIPMENT

13. With many full face masks, the diver's nose cannot be reached by the diver to perform a Valsalva manoeuvre. State what design feature is included in such a mask to assist divers to equalise their ears and how a diver should use it to equalise their ears.

a) _____

b) _____

14. The pressure recorded in a diving cylinder, left overnight in a cold kit store, is often observed to have changed since it was originally filled. What has happened to the pressure in the cylinder overnight. State the name of the gas law which has been observed.

a) _____

b) _____

15. State four pieces of information which you should obtain from a CCR diver prior to dive, when acting as dive manager.

a) _____

b) _____

c) _____

d) _____

16. State two ways in which you can identify a cylinder suitable for use in an oxygen administration kit.

a) _____

b) _____

17. State one reason why reducing the pitch of the propeller might improve the ability of a rib to get on to the plane when heavily laden with divers and kit. State one disadvantage of reducing the pitch of the propeller.

a) _____

b) _____

18. Your club is going to buy a new echo sounder and they are unsure what the different transducers are used for. They have been looking at 83 KHz and a 455 KHz transducers. Can you sketch and describe the different depths and beam angles they are best suited for.

a) 83 KHz

b) 455 KHz

a) _____

b) _____

DIVE PLANNING & TECHNIQUES

19. Write down two advantages and two disadvantages of primary donate.

Advantages

a) _____

b) _____

Disadvantages

c) _____

d) _____

20. When planning to dive an exposed offshore site list four factors in order of importance that will affect the planning.

a) _____

b) _____

c) _____

d) _____

21. The engine of the inflatable (not a RHIB) breaks down and you are drifting. You have divers in the water. There is a North Wind and a Northerly current. Which way will a diver drift in the water. Which way will the boat drift. List two methods of reducing the distance the inflatable will drift.

a) _____

b) _____

c) _____

d) _____

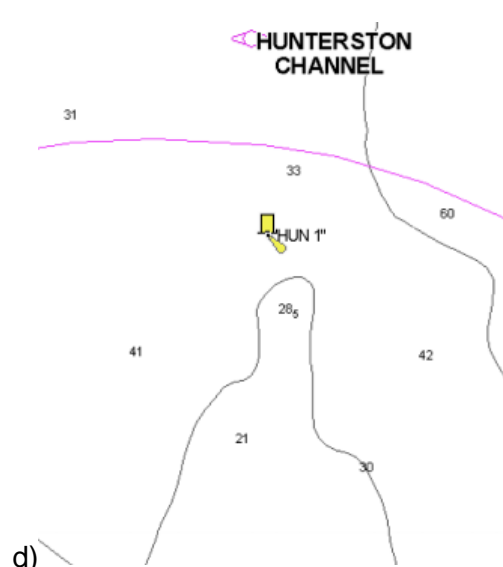
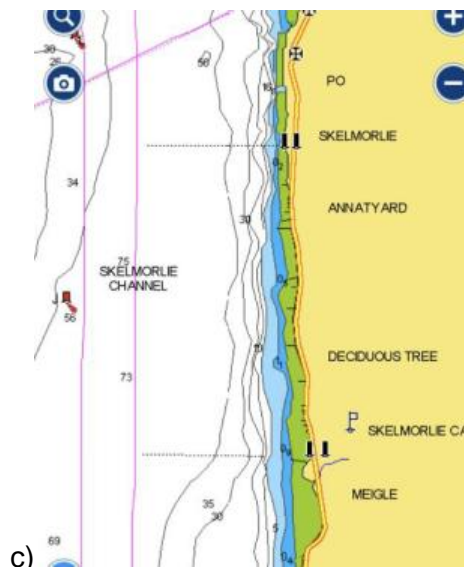
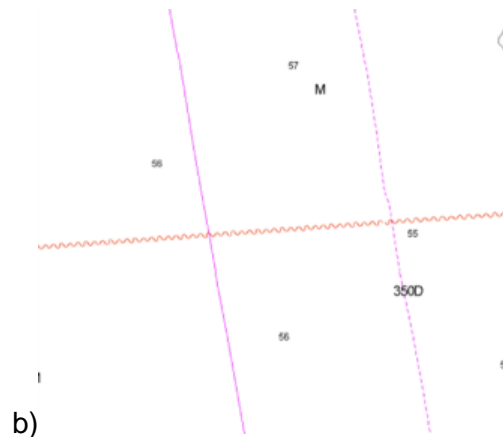
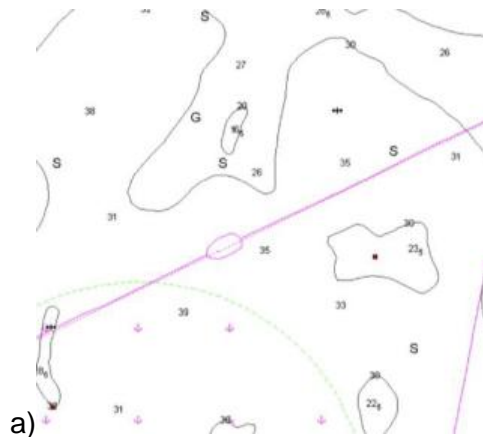
22. On the images from a Navionics chart below.

a) On image a) what does the magenta line running diagonally across the centre of the chart indicate.

b) On image b) what does the Red zigzag line running Horizontal across the chart indicate.

c) On image c) what do the double set of black beacons on the shoreline indicate.

d) On image d) the Yellow Special Purpose Buoy has the following written about it FL(4) Y 15s what light sequence does this indicate.



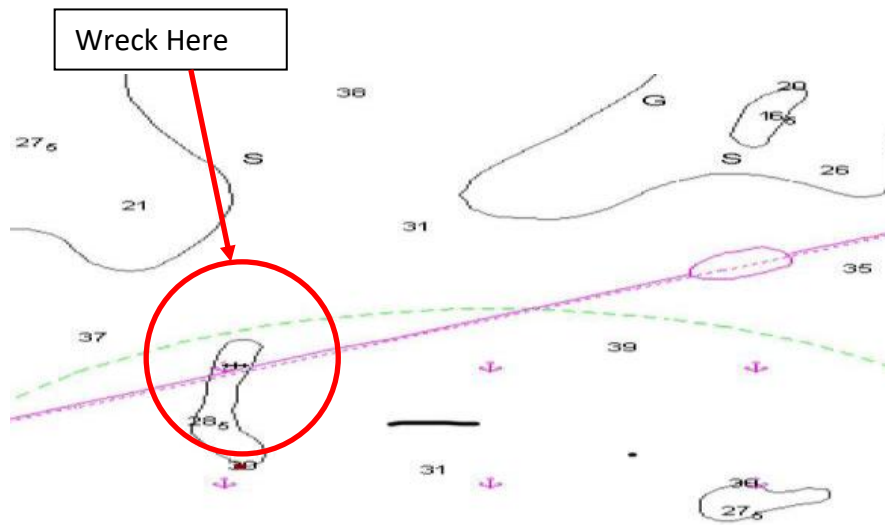
a) _____

b) _____

c) _____

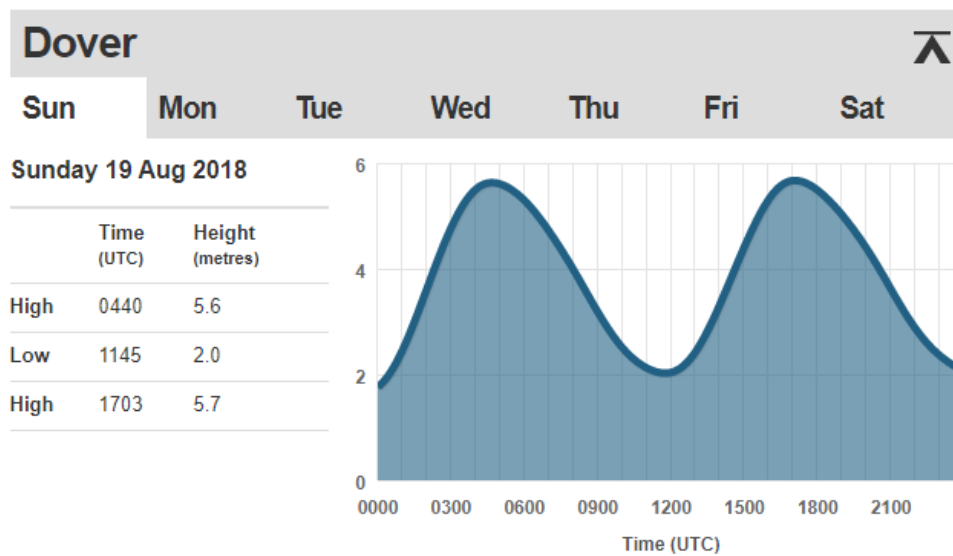
d) _____

23. List two precautions you would take before diving the wreck to mitigate the possible danger represented.



- a) _____
- b) _____

24. You are planning to Dive on a on a wreck off Dover with a Chart Datum depth of 26.4 metres using the tidal information below what depth would you expect at 3pm BST on August 19th 2018.



TIDAL INFORMATION SUPPLIED BY THE [UK HYDROGRAPHIC OFFICE](#)

TIMES DISPLAYED ARE IN UTC (GMT).

a) _____

WEATHER & SEAMANSHIP

25. You are going out diving with two club RHIB's, you are going to give the boat briefing what channel's would you tell the group to use for ship to ship communications, list four channels.

a) _____

b) _____

c) _____

d) _____

26. Sketch below one fast and one slow transit

Fast Transit

Slow Transit

Describe the difference between the two types of transit when using them to locate a wreck.

a) _____

b) _____

27. You are looking at a chart and see lights that indicate a safe course to steer through a channel or into a harbour. What are the lights called and how do they indicate your position relative to them.

a) _____

b) _____

28. Name two types of fog and describe how they are formed.

a) _____

b) _____

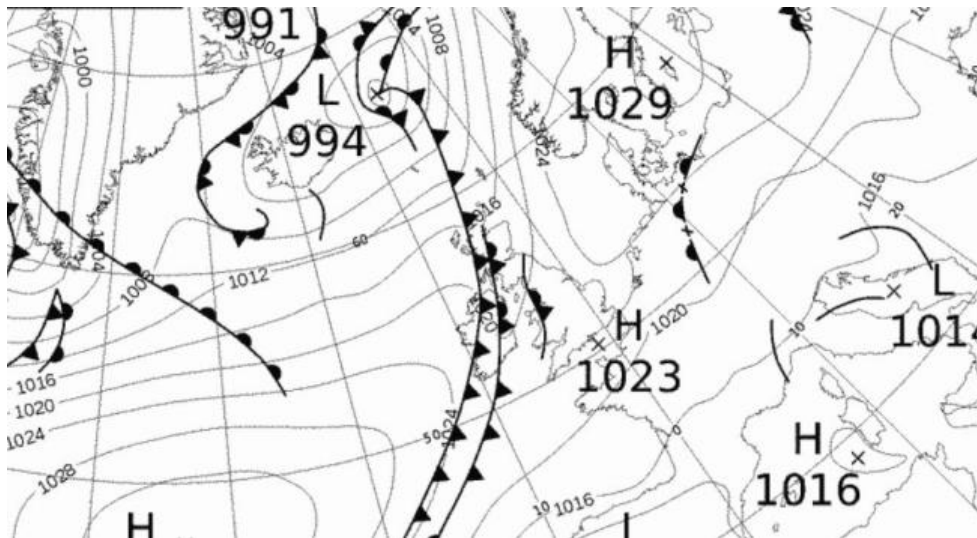
29. What is the weather symbol below called and describe the weather associated with it



a) _____

b) _____

30. With reference to the pressure chart below, state the direction of the wind and what weather you would expect across Scotland on the chart.



a) _____

b) _____