

2001 JSA of LIS Navigation Test

ANSWERS

1.

Leg	Bearing (magnetic) (2 points each)	Distance (nautical miles) (2 points each)
a) Start to Mark 1	120°	3.1 nm
b) Mark 1 to Mark 2	056°	7.7 nm
c) Mark 2 to Mark 3	096°	19.3 nm
d) Mark 3 to Mark 4	353°	4.1 nm
e) Mark 4 to Mark 5	254°	13.5-13.8 nm
f) Mark 5 to Finish	266°	14.7 nm

For the bearings, full credit is given for answers within 001° of the answers shown above. For the distances, answers must be within 0.1 nm of the answers shown above (except e which has the range shown). Bearings get full credit even if they do not have the initial 0 or are not labeled with °. Distances get full credit even if they are not labeled with nm.

2. D. 40° 55.5' North
3. A. Boat end
This end is more upwind by 10°. That is, the line is set square to a wind direction of 115°, but the wind is blowing 125°.
4. B. Starboard tack
The course to the first mark is 120° and the wind is blowing 125°. Therefore, you will spend more time on starboard tack.
5. A. 082°
Leeway will make you sail 3° lower over the bottom (085° - 003° = 082°).
6. C. 165°
The wind is blowing from 125°. If your tacking angle is 80°, you will sail 085° on starboard tack and 165° on port tack. When you are on the port-tack layline, Mark 1 will bear 165°.
7. D. 73° 38.2' West
8. B. 1/2 mile

You round the mark at 1650 and sail at 6.0 knots until the next boat rounds at 1655. In five minutes you will have gone 1/2 mile ($6.0 \times 5/60$).

9. B. 1807

The leg from mark 1 to Mark 2 is 7.7 miles. At a speed of 6 knots, this will take you $7.7/6$ hours, or 1 hour 17 minutes. Add this to the time you rounded Mark 1 (1650) and you get 1807.

10. 10.1 3.6 nautical miles

Measure from the point where the red light sector line intersects your rhumbline course from mark 1 to mark 2. Margin of error is plus/minus 0.1 nm.

10.2 It marks a danger zone, a channel and/or a harbor entrance.

11. C. 050°

The wind is blowing from 090° and your tacking angle is 80°. Therefore, your closehauled course on starboard tack will be about 050°.

12. True

13. 13.1 D. 66 feet

Your position turns out to be right on the 60-foot contour line. However, it is still nearly high tide, so you have to add about 6 feet to the depth.

13.2 13.3 nm

The allowable margin of error is plus/minus 0.2 nm.

13.3 100° or 101°

Acceptable answers are 99°, 100°, 101° or 102°

13.4 Port tack

The bearing to the mark is about 100° and the wind is blowing 090°, so you have to sail farther on port tack.

14. A. You're ahead of them

The wind is at 090°, so other competitors are equal with you if they bear 180° (or 000°) from you. However, this boat bears 186°, which puts them behind you.

15. C. 347°

Mark 4 bears 353° from Mark 3, but you must steer to the west of that to compensate for the current.

16. B. 2222

The leg is 4.1 miles long and your speed over the bottom is just under 6.0 knots (because you are headed slightly into the current). Therefore, it will take between 40 and 45 minutes to sail this leg. Since you rounded mark 3 at 2140, you'll get to mark 4 at about 2222.

17. A. Spinnaker
The tricky thing here is that if you sail straight toward Mark 4, your true wind angle will be 97° (090-353) so you'll be faster with a genoa. However, when you adjust your course for the current, your true wind angle is 103° (090-347) so a spinnaker is faster.
18. 18.1 White
- 18.2 C. About 64 feet
The chart lists the height of the light as 60 feet, but that is above mean high water. In your situation, the current has been ebbing for over 3 hours, so the light is another 4 feet or so above the water surface.
- 18.3 True
19. C. Period (timing) of the light
20. 20.1 False
- 20.2 False
It is a can with a flat top.
21. C. 250°
The wind direction is 090° , which means if you can sail dead downwind you'd be steering 270° . However, your jibing angle is 40° , so you will steer 290° on starboard tack and 250° on port tack.
22. B. No
The rhumbline course to the next mark is 254° , so you won't be able to make it without jibing if you sail 250° on port tack. This is especially true since the current will be setting you to windward at 0.5 knots.
23. B. Chute W
The true wind speed on this leg is 10 knots. However, you are sailing downwind at about 5 knots, so the wind you feel (apparent wind) will be roughly 5 knots. Therefore, the white spinnaker will be faster.
24. A. You will cross in front of the ship
You are gaining bearing, so you will cross ahead.
25. 013°
Your compass bearing is 010° and your deviation is 3° East. To correct this to a magnetic bearing, you must add the easterly error. $010 + 3 = 013^\circ$
26. 26.1 True
See pages 24 and 27 in "Coastal Navigation."
- 26.2 True

Compasses with deviation typically have different amounts of deviation at different headings.

27. 27.1 B. Green
- 27.2 B. Flashing
- 27.3 41° 00' North
The margin of error is plus/minus 0.1'. The label "North" was worth one of the two points.
28. 28.1 B. 83 feet
Use these lines of position: Bell R32 bears 290° and Greens Ledge lighthouse bears 200° (290 - 90). Since it is now low tide, you can use the depth reading right from the chart.
- 28.2 C. 263°
29. D. Isophase
"ISO" means the light has equal periods of light and darkness.
30. B. 005°
Make sure you take your bearing to the Great Captain's lighthouse, not the other spires at the western end of the island.
31. 253° or 254° is worth 2 points; 252° or 255° is one point.
The reciprocal of 060° True is 240° True. To get a magnetic course, add the westerly deviation of 13° or 14°.
32. True
33. 13° 45' West
Acceptable answers are anything from 13° 00' West to 14° 00' West.
The label "West" is worth one of the two points.
34. 34.1 1.6 nm plus/minus 0.2 nm
Use the "running fix" technique on page 64 of "Coastal Navigation."
- 34.2 275° plus/minus 4°
35. B. Pin end (R42)
At a downwind finish, you should cross the line at the end that is more upwind. With the wind at 105°, the line would have to bear 015° to be square. Since the bearing from the RC boat to R42 is 025°, it makes the pin end farther upwind.