11. On 17th March, 1925, at 18 h. 15 m. New Zealand mean time at ship in lat. 44° 30′ S., long. 172° 21′ E., the sun set bearing by compass W.S.W.

    Required—The true amplitude and error of the compass, also the deviation, the variation being 17·9° E.

12. In a vessel steering S.E. by compass and steaming 10 knots a light is observed bearing S.S.E. by compass, and after making good the course and speed for 24 minutes the light was observed to bear south by compass.

    Required—The course to be steered to enable the vessel to pass 2 miles off the light.

2. NAUTICAL ASTRONOMY AND THE COMPASS.

Time allowed 3 hours.

1. 1925, August 20th: Ship in D.R. position, lat. 35° S., long 172° E. Shortly after sunset the observed altitude of the star *a* Scorpii (Antares) on the meridian was 78° 45′. Height of eye, 28 ft. Index error of sextant, 2′ 30″ off the arc.

   Required—The latitude.

2. A vessel steering N.N.W. observed a shore light bearing N., and after steaming for 5 miles the light bore N.N.E.

   Find the distance the vessel will be from the light when it is abeam, assuming the vessel to make good the course steered.

3. 1925, on 31st January, at 07 h. 10 m. N.Z. mean time, at ship in lat. 36° 4′ S., long. 172° 48′ E., the sun bore by compass N. 76° E.

   Required—The true bearing of the sun by time-azimuth tables, and the error and deviation of the compass, the variation being 16° E.

4. The bearing of two objects when in line with each other was found on the chart to be S. 80° W. mag., but when brought in line on board they bore S. 76° W. by compass.

   Required—The deviation of the compass for the direction of the ship's head at the time.

5. When taking a meridian altitude, how do you know when the sun is on the meridian; or, in other words, when it is noon?

6. How does the sun bear (true and magnetic) when on the meridian of an observer in these latitudes (home-trade limits).

7. What do you mean by the "deviation" of the compass, and how is it caused?

8. Having determined the deviation, how do you know when it is easterly and when westerly?

9. How could you find the deviation of your compass when in port or when sailing along a coast?

10. Name some suitable objects by which you could readily obtain the deviation of your compass when sailing along the coasts, or the channels you have been accustomed to use.

11. What means are there for checking the deviation of your compass by night?

12. Do you expect the deviation to change? If so, state under what circumstances.

13. What is meant by the "variation" of the compass, and what is the cause of it?

3. NAUTICAL ASTRONOMY.

Time allowed 2 hours.

1. 1925, June 10th, p.m., in D.R. long. 173° 30′ E., the observed altitude of the sun's lower limb was 12° 4′ when a chronometer indicated 05 h. 03 m. 20 s. Eye elevated 30 ft. Sextant error 2′·0 off the arc. The chronometer was 14 m. 10 s. fast of M.T.G. Later, after the ship had made 12 miles on a 130° course, the latitude by meridian altitude of the star Regulus was found to be 40° 18′ S.

   Required—The longitude by chronometer at the time when the meridian altitude of Regulus was observed.