by compass N. 65° E., time by a chronometer 04 h. 58 m. 27 s., which was slow for mean noon at Greenwich, 20th April, 1925, 1 m. 10 s., and losing 2·8 s. daily. The latitude by meridian altitude at noon being 39° 38′ S., the ship having run 070° 41 m., between the time of taking the observation for longitude and noon.

Required—The longitude by chronometer at the time of taking the observation, also brought up to noon.

Required also—The true alt.-azimuth, and error of the compass; and, supposing the variation to be 26° W., required the deviation of the compass for the direction of the ship's head.

2. On board a ship steaming south at 10 knots, a lighthouse was observed bearing S. 54° E. After steaming for 36 min., the same lighthouse was observed to bear S. 80° E.

Find the distance of the ship from the lighthouse at the second observation.

3. Draw a figure and prove that $\sin 45° = \sqrt{\dfrac{1}{2}}$

3. CHART.

Time allowed 3 hours.

1. Using Deviation Card No. XIV, find the courses to steer by compass from a position with Inisheer Lt.-Ho'. bearing N. 8° W. (mag.), distance 3 m., to reach a position with Fastnet Lt.-Ho'. bearing N.E. (mag.), distance 6 m., and giving the distance run on each course.

   Note.—Take the ship from position off Inisheer to the position off Fastnet on three courses, altering course when Inishtearaght Lt.-Ho'. bears abeam on approaching course, distant 6 m., again altering course when Gull Rock Lt.-Ho'. bears abeam, distant 12 m.

2. With the ship's head on the first above-named compass course, Loop Head Lt.-Ho'. bore S. 88° E. by compass and Sybil Head bore in transit with Clogher Head, find the ship's position and the set and drift experienced, the ship having run 4 hours on this course, steaming 10 knots.

3. With the ship's head on third above-named compass course, Gull Rock Lt.-Ho'. bore by compass S. 76° E., and after continuing on the same course 2 hours, it bore by the same compass N. 29° E., find the position of the ship and her distance from Gull Rock Lt.-Ho'. at the time of taking the second bearing, making due allowance for a current which set west (mag.) 2 knots, ship steaming 8 knots.

4. Find the course to steer by compass from the position where course is altered off Inishtearaght (see Question 1), to position where course is altered off Gull Rock, to counteract the effect of a current setting S. 62° W. (mag.) at the rate of 2 knots, ship making by log 9 knots. Find also the length of time it would take the ship to reach the given position.

5. The following horizontal sextant angles were taken to determine the ship's position : Fastnet Lt.-Ho'. 79°, Galley Head Lt.-Ho'. 40°, Old Head of Kinsale Lt.-Ho'.

   Find the latitude and longitude, using a station pointer.

6. On 6th March, 1925, at 08 h. 40 m., standard time, being off Avonmouth, took a cast of the lead.

   Required — The correction to be applied to the depth obtained before comparing it with the depth given on the chart.

4. ESSAY.
Time allowed 1 hour.

A suitable subject will be selected by the Examiner.

191. Specimen Set of Examination-papers for First Mate (F.G.) :—

1. NAVIGATION AND NAUTICAL ASTRONOMY.

Time allowed 3 hours.

Draw suitable figures and give the necessary description for each problem.

1. On 28th April, 1925, a.m. at ship, the observed altitude of sun's L.L. was 22° 27′, index error 1′ 10″ to add, height of eye 23 ft.,