

- m.* Use and adjustments of the sextant; read *off* and *on* the arc; and the mode of finding the index error by both horizon and sun.
- n.* Construction, use, and principle of the barometer, thermometer, and hydrometer; also the use and care of a chronometer.
- o.* Weights and measures (English and metric system).
- p.* Markings, signs, and abbreviations on Admiralty charts and plans.
- q.* General Notices published in the Board of Trade Summary of Notices to Mariners.
- r.* Elementary questions on the main parts of a ship's construction.

52. Seamanship.—The candidate must understand and be able to give satisfactory answers on the following subjects in so far as those subjects relate to steamships:—

- a.* Standing and running rigging.
- b.* Bending, unbending, setting, reefing, taking in, and furling sail.
- c.* Sending masts and yards up and down, &c.
- d.* Management of ships' boats in heavy weather.
- e.* Care and usage of mechanical logs and sounding-machines.
- f.* Marking and use of the ordinary lead and log lines.
- g.* Dunnaging and stowing cargo, &c.
- h.* Construction, use, and action of the sluices and of the water-ballast tanks.
- i.* Engine-room and other telegraphs used on board ship, and deck appliances generally.
- j.* Seeing everything in readiness and clear for getting under way, and the precautions to be then observed with regard to steering-gear and connections, engines, propeller, &c.

Also he must have a thorough knowledge of—

- k.* Rule of the road as regards both steamers and sailing-vessels, their regulation lights, and fog and sound signals.
- l.* Signals of distress, and signals to be made by ships wanting a pilot, and the liabilities and penalties incurred by the misuse of these signals.
- m.* Use and management of the rocket apparatus in the event of a vessel being stranded.
- n.* Any questions appertaining to the duties of the second mate of a steamship which the Examiner may think necessary to ask.

53. Additional Seamanship for a Candidate for an Ordinary Certificate.—A candidate for an ordinary certificate must, in addition to the foregoing requirements for a steamships certificate, understand and give satisfactory answers to the subjects in seamanship enumerated in subparagraphs *a* to *h* inclusive in so far as all those subjects relate to both wooden and steel sailing-ships, and to the following subjects:—

- o.* Management of a sailing-ship under canvas.
- p.* Any questions appertaining to the duties of the second mate of a sailing-ship which the Examiner may think necessary to ask.

ONLY MATE, AND FIRST MATE.

(The syllabus of examination for either certificate is identical.)

54. Navigation.—In addition to the following requirements the candidate will be examined in the navigation and seamanship prescribed for the grade of second mate.

- a.* Answer questions on right-angled spherical trigonometry.
- b.* Compute the time at which a given star will be on the observer's meridian.
- c.* Determine what bright stars will be within a certain hour-angle from the observer's meridian, above the Pole and above the horizon, at any given time; also the hour-angle, east or west, of each of the stars, and whether they are to the north or south of the observer's zenith when passing the meridian.
- d.* Compute the approximate meridian altitude of a star for setting the sextant.
- e.* Find the latitude by meridian altitude of a star.
- f.* Find the longitude by chronometer by an altitude of a star.
- g.* Find the true azimuth of a star by the Time Azimuth Tables, and deduce the deviation therefrom.