

ii. One year as master duly certificated as aforesaid, and in addition three years in a capacity not lower than mate, at least one year of which must have been served whilst holding a certificate not lower than that of second mate of a foreign-going ship.

(NOTE.—For interpretation of the phrase “service as first mate, second mate, &c.,” for the purposes of these regulations see para. 112.)

SYLLABUS OF EXAMINATION IN NAVIGATION AND SEAMANSHIP.

SECOND MATE.

51. Navigation.—Diagrams and explanations to be given. Candidates for foreign-going certificates as master or as mate of any grade must give a written explanation of any of the terms and definitions used in navigation and nautical astronomy that may be asked, and they must give a diagram and an explanation for each of the problems worked by them.

- a. Write a legible hand and spell correctly. For the purpose of testing his ability the candidate will be required to write a short essay on some suitable subject.
- b. Show a competent knowledge of the first five rules of arithmetic and the use of logarithms.
- c. Answer questions on elementary plane trigonometry.
- d. Work a day's work complete, correcting the courses for leeway, deviation, and variation.
- e. Find the latitude by meridian altitude of the sun.
- f. Work any practical problem in parallel sailing.
- g. Find the true course and distance from one given position to another by Mercator's method; also the compass course, the variation and deviation being given.
- h. Find the true amplitude of the sun, and the error of the compass therefrom; also the deviation, the variation being given.
- i. Find the longitude by chronometer from an altitude of the sun by the usual methods, computing the daily rate of a chronometer from errors observed when such is required; also find the true azimuth of the sun, and the compass error and deviation; the variation being given.
- j. Find the true azimuth of the sun by the Time Azimuth Tables, the compass error, and the deviation; the variation being given.
- k. Find on a chart or plan the course or courses to steer and the distance or distances from one given position to another.

Find the ship's position, together with the set and drift (if any), on the chart or plan from cross-bearings of two objects.

Find the ship's position from two bearings of the same or different objects, the course and distance run between taking the bearings being given, making due allowance for a given tidal stream or current; also, the distance of the ship from the object or any given position at the time of taking the second bearing.

Find on a chart or plan the course to steer by compass in order to counteract the effect of a given tidal stream or current, and the distance the ship will make good towards a given point in a given time.

Fix a ship's position on a chart or plan by horizontal sextant angles, using a station-pointer.

Work out practically the correction to apply to soundings taken at a given time and place to compare with the depth marked on the chart; and give a method of finding approximately the time of high water at any given place without the aid of the Admiralty or other Tide Tables.

The candidate will be examined orally in the following subjects:—

- l. Morse and British movable semaphore alphabets; International Code of Signals; and the Allied Signal Manual. He will be required to attain a minimum speed of 10 words per minute in semaphore, 6 words per minute in Morse lamp-flashing, and 5 words per minute in Morse flag-waving. (See Appendix D, page 2996.)