

SPECIMEN SET OF EXAMINATION PAPERS FOR FIRST MATE, FOREIGN-GOING.

PRACTICAL NAVIGATION I.

Paper 1 (3 hours).

1. On 11th December, 1929, in cloudy weather, the position by D.R. being in Lat. $39^{\circ} 00' N.$, Long. $141^{\circ} 10' W.$, a "snap" altitude of a bright star, whose identity was not ascertained, was taken as $43^{\circ} 03'$ (corrected). The time by a hack watch was 12h. 48m. 54s., which was found to be 16m. 20s. fast of G.M.T. The approximate bearing of the star was 238° .
Establish the identity of the star.
2. From the following data find the latitude and position line, G.M.T., 3rd March, 1929, 00h. 55m., position by D.R. Lat. $51^{\circ} 35' N.$, Long. $28^{\circ} 30' W.$, Obs. Alt. Pole Star $51^{\circ} 09'$; Height of eye, 26 ft. Sextant error, nil.
3. On 7th October, 1929, at about 16h. 10m. M.T.S. in position by D.R. Lat. $50^{\circ} 20' S.$, Long. $17^{\circ} 10' W.$, an observed altitude of Saturn was $61^{\circ} 46'$; Height of eye, 30 ft. Correct G.M.T. 17h. 19m. 03s.
Find the latitude and the line of position.
4. On 10th November, 1929, at 8.30 a.m. A.T.S. is was ascertained that the ship was on a N. 50° E.—S. 50° W. position line through D.R. Lat. $50^{\circ} 10' N.$, Long. $27^{\circ} 30' W.$, the log registering 97.
At 11.40 a.m. A.T.S. an ex-meridian sight of the sun gave Lat. $50^{\circ} 35' N.$, log 25.
In the interval the ship steered 322° to allow for a current estimated to set 090° at 1 knot.
Find by calculation, or by plotting, the position of the ship at 11h. 40m. a.m.
5. On 10th April, 1929, at about 11h. p.m. the position by D.R. being Lat. $36^{\circ} 20' S.$, Long. $52^{\circ} 10' E.$, the following observations were taken to determine the ship's position:—
(a) Obs. Alt. α Centauri to Eastward of Meridian $57^{\circ} 18'$, G.M.T. 19h. 21m. 58s.
(b) Obs. Alt. α Leonis (Regulus) to Westward of Meridian $33^{\circ} 49'$, G.M.T. 19h. 23m. 11s.
The sextant used was correct; Height of eye, 40 ft.
Find the ship's position by means of the position lines.

PRACTICAL NAVIGATION II.

Paper 2 (2 hours).

1. The ship's head by compass being in turn on the eight principal points of the compass, and the compass bearing of a distant object on each course being as stated below, find the magnetic bearing of the object and construct, on squared paper, a deviation curve.
Compass course N NE E SE S SW W NW
Compass bearing S75W S64W S56W S50W S34W S31W S49W S71W
From the curve ascertain the deviation for the following compass courses, N.N.E., E.N.E., N.N.W., and W.N.W.
2. The position of the vertex of the Great Circle from A. Lat. $48^{\circ} 26' N.$, Long. $161^{\circ} 24' E.$, to B. Lat. $37^{\circ} 54' N.$, Long. $142^{\circ} 46' W.$, being Lat. $48^{\circ} 46.4' N.$, Long. $170^{\circ} 14.7' E.$ Calculate the latitudes at which the Great Circle track crosses the meridian of 170° E. and each 10th degree of longitude from it towards the destination and plot the track on the Mercator's chart provided.
3. Calculate, by the use of Harmonic Constants, the height of tide at 11h. G.M.T. of 30th May, 1929, off Dover.

CHART WORK.

Paper 3 (2 hours).

1. You are bound from Colombo to Singapore in a low-powered steamer in the S.W. monsoon. Lay off on the general chart provided the true courses you would steer, and the distances to be made good to the entrance to the Malacca Straits. From the entrance lay off on the small-scale chart provided the true courses to be steered, and the distances to be made good to arrive at the Eastern Anchorage. In making the voyage through the Straits mention the salient points for alteration of course, giving a brief description of how you would recognize them in the daytime and the distance off you would pass.