2. What precautions would you take when transferring position from one chart to another ?

Why is it advisable to use the compass nearest to the work on the chart ?

SHIP CONSTRUCTION AND STABILITY.

Paper 4 (3 hours).

1. Sketch and name the various rolled sections used in ship construction.
2. What is the usual method adopted for distinguishing the strakes and plates of a ship ?
3. What is a Web Frame ? Give a rough sketch showing how it is built up.
4. Name the different members of the transverse framing in a ship with ordinary floors.
5. Define (*a*) Reserve buoyancy, (*b*) Displacement, (*c*) Centre of gravity, (*d*) Centre of buoyancy.
6. How does increase of freeboard affect stability ?
7. In a vessel of 3,000 tons displacement a weight of 100 tons is moved 20 ft., and a weight of 50 tons moved 10 ft. upwards in a vertical direction. Calculate the effect on centre of gravity.
8. What is meant by a vessel being—

(*a*) Stiff. (*b*) Tender.

What effect has the flooding of a double-bottom tank on the stability of a ship ?

SHIP MAINTENANCE, ROUTINE, AND CARGO WORK.

Paper 5 (3 hours).

1. Your vessel has sustained damage leaving harbour. Where and how should this be recorded ?
2. How often should the crew be exercised at boat drill ? Draw up your routine for boat drill.
3. The bilges of your ship are choked and very dirty. State in detail how you would clean them.
4. What precautions must be taken when loading a full cargo of sawn timber ?
5. How should a magazine be constructed ?
6. The derricks of a vessel are tested to lift 5 tons each, no heavy derrick being available. There is a weight of 6 tons to be lifted out of the hold. What gear would you rig to land this weight on deck ?
7. One of the steering chains has carried away. What action would you take ?
8. While loading a cargo of sugar a slight leak is observed at one of the frames in the hold. State exactly what you will do.
9. State in detail how you would load a cargo of grain in bulk in the Black Sea.

METEOROLOGY.

Paper 6 (2 hours).

1. Describe briefly a Kew Pattern Marine Mercurial barometer and explain the principle upon which it functions.
2. Describe how you would estimate the force of the wind from the bridge of a steamer under way at sea, using the Beaufort Scale of wind forces ; and how you would ascertain its true direction.
3. Describe the wind systems of the North and South Atlantic Oceans, giving their names and the general pressure distribution associated with them.
4. What is " barometric gradient," how is it measured, and how does it affect the force of the wind over the ocean ?
5. Describe the structure and characteristics of a tropical revolving storm, also its movements.
6. (*a*) On a day in the month of September a ship A, in Lat. 20° 1′ N., Long. 65° 10′ W., proceeding on a south-westerly course at 13 knots, observes the signs of a hurricane. The wind is north, a light breeze, barometer 29·94 in. At the same time she receives information from a ship B in Lat. 22° 2′ N., Long. 60° 3′ W., that her barometer is 30·00 in. and the wind from E. by S., force 6.

What is the approximate position of the centre of the storm relative to A and B ? (Appropriate chart to be provided.)

(*b*) In such circumstances what is the correct action for A, and why ?

(*c*) A few hours later, from wireless weather reports, A ascertains that the centre is travelling north-westward. A has experienced an increasing wind which is backing, and her barometer is falling. What should she do now ?