

AUXILIARY EQUIPMENT PART 1

Attempt ALL questions

Marks for each part question are shown in brackets

1. With reference to ship's side valves:
 - (a) state why grey cast iron is not a suitable material;
 - (b) state, with reasons, TWO suitable materials;
 - (c) state the regular maintenance that the valves should receive, outlining reasons for this maintenance.

2.
 - (a) Describe, with the aid of sketches, the operating principles of a centrifugal pump.
 - (b) State why centrifugal pumps are not self-priming.

3.
 - (a) Explain the circumstances under which EACH of the following devices fitted to an air compressor may operate:
 - (i) fusible plug;
 - (ii) bursting disc.
 - (b) State where EACH device in part (a) may be fitted.

4. With reference to hydraulic systems:
 - (a) state THREE possible contaminations;
 - (b) state possible causes of the contaminations stated in part (a).
 - (c) explain how the contaminants stated in part (a) are prevented from affecting the system.

5. Describe, with the aid of a block diagram, the operation of an automatic steering system, including auto-pilot and valve operated steering gear.

6. With reference to controllable pitch propellers:
 - (a) describe a mechanism that changes the pitch of the blades;
 - (b) explain how the pitch of the blades is indicated.

7. With reference to intermediate shaft bearings of the roller type, describe, with the aid of a sketch, EACH of the following:
- (a) how some angular misalignment of the shaft is accommodated;
 - (b) how longitudinal movement of the shaft is accommodated.
8. Sketch an arrangement for the aft seal of an oil lubricated stern tube bearing.
9. (a) State FIVE devices fitted to a main distribution switchboard in order to protect a.c. generators that can be operated in single or parallel mode.
- (b) Explain why EACH device stated is needed.
10. (a) Explain the term *single phasing*.
- (b) State the effects on a motor of single phasing.
- (c) State how single phasing may be protected against in the motor starter circuit.