

AUXILIARY EQUIPMENT PART I

Attempt ALL questions
Marks for each part question are shown in brackets

1. (a) Sketch a section through a 3-way mixer valve. (8)
- (b) State an application for this type of valve. (2)
2. With reference to centrifugal pumps used for bilge/ballast purposes:
- (a) explain the specific problems which may arise using the pumps for these purposes; (4)
- (b) explain TWO methods used to improve pump performance when used for these purposes. (6)
3. With reference to air compressors:
- (a) state TWO advantages of rotary air compressors; (2)
- (b) state ONE advantage of reciprocating air compressors; (1)
- (c) explain why multistage air compressors are used for starting air purposes. (7)
4. (a) List SIX examples of contaminants that may be found in hydraulic oil. (6)
- (b) State the actions to be taken to reduce or remove the contaminants listed in part (a). (4)
5. Describe, with the aid of a block diagram, the control of an automatic steering system, including auto-pilot and valve operated steering gear. (10)
6. With reference to controllable pitch propellers:
- (a) explain why they should maintain a small amount of pitch when in the neutral position; (3)
- (b) state, with reasons, the failsafe position; (4)
- (c) explain how pitch may be restored should hydraulic system failure occur. (3)

7. Whilst a single screw vessel is on passage it is noticed that an intermediate shaft bearing is running hot.

- (a) State FIVE possible causes. (5)
- (b) Explain the procedure that should be followed in order to reach port for further investigation if there were no obvious causes. (5)

8. With reference to main propulsion shaft hydraulic sleeve type couplings:

- (a) describe, with the aid of a sketch, the removal procedure; (7)
- (b) state how it is determined, during reassembly, that the push fit is complete. (3)

- (a) Describe, with the aid of a sketch, a cartridge type fuse. (7)
- (b) State why a fuse used in a motor circuit differs from a fuse used in a lighting circuit. (3)

Higher 3/ load deal with surges

will blow immediately

Describe TWO methods for detecting earth faults within a distribution system. (10)

insulated

ARR: earth normal

1 earth fault

usability