

AUXILIARY EQUIPMENT PART II

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

1. Describe, with the aid of a sketch, the operation of a variable delivery axial piston pump. (10)

2. (a) Explain why a hydraulic actuator is preferred for a vessel's stabiliser over an electrical actuator. (5)
- (b) Sketch a hydraulic circuit for a single stabiliser, suitable for a constant pressure system. (5)

3. With reference to the Electrical Circuit Diagram:
 - (a) state the purpose of this circuit; (2)
 - (b) describe the functions the areas marked within the dotted lines numbered 1, 2, 3 and 4. (8)

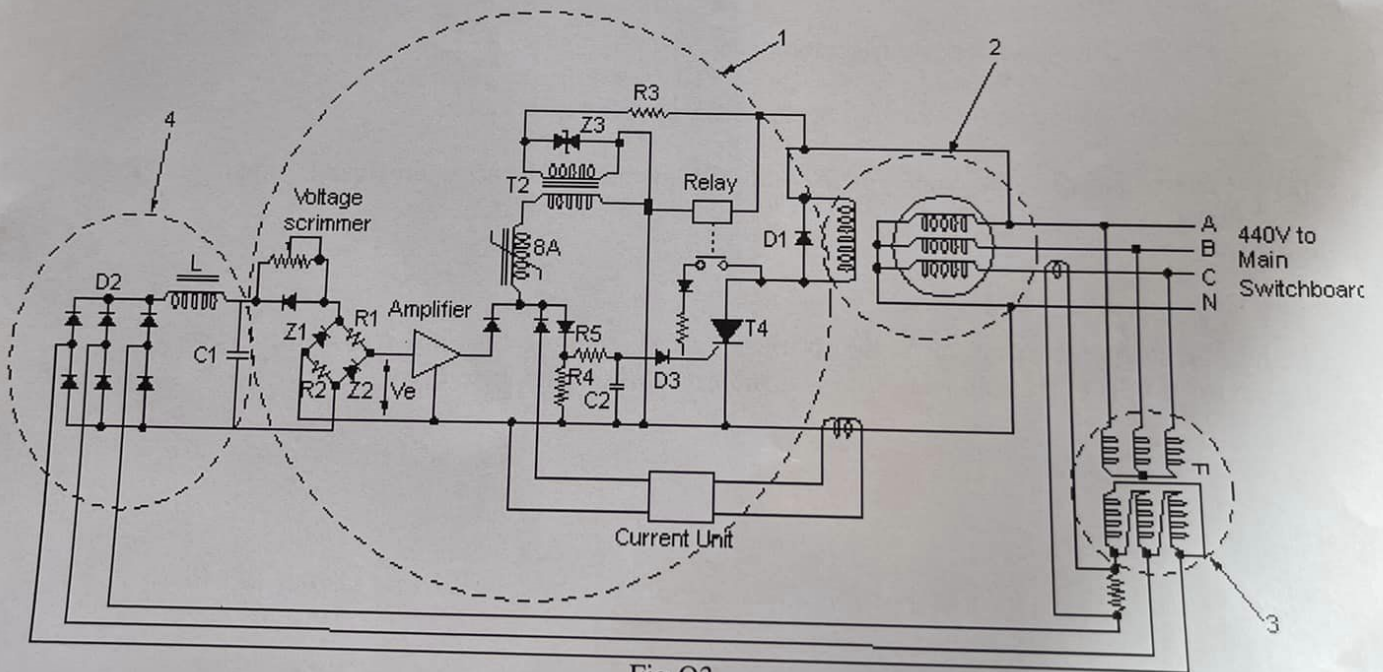


Fig Q3

4. With reference to a 440 Volt, 3-phase motor supplied with six terminal connection in the terminal box:
- (a) sketch a Delta connection, showing the relationship between phase and line voltages; (2)
 - (b) sketch a Star connection, showing the relationship between phase and line voltages; (2)
 - (c) state the relative speed of both connections; (2)
 - (d) sketch and label the terminal link connections so the motor will run in permanent Delta mode. (4)
5. (a) State THREE types of damper that may be used to control the airflow in an air conditioning system. (3)
- (b) Describe, with the aid of a sketch, an automatic fire damper installed in a vertical air duct or in those that pass through bulkheads designated as fire boundaries. (7)
6. (a) State FOUR properties of refrigeration oil. (4)
- (b) Describe the operation of an Oil Separator in a refrigeration system. (4)
- (c) State reasons for the employment of an oil separator in refrigeration vapour compression units. (2)
7. With reference to the visual inspection of lifting gear before use, state the removal from service criteria for EACH of the following slings when visually inspecting before use:
- (a) wire rope; (5)
 - (b) synthetic fibre. (5)
7. *Note: The slings are within inspection dates, are of the correct SWL and clearly labelled.*
8. With reference to the storage of volatile fuels, describe the construction and placement requirements of the storage tanks for aviation fuel, including tank ventilation. (10)
9. Sketch the device which allows a cable to pass through a watertight bulkhead, labelling the MAIN components. (10)
10. With reference to longitudinal stresses in a vessel's hull:
- (a) state the cause of the stress; (3)
 - (b) state the areas where the stress is a maximum; (3)
 - (c) describe the structure that resists the stress. (4)