

ENGINEERING, DRAWING AND SHIP SYSTEMS

Attempt ALL questions

Marks for each part question are shown in brackets

Section A

1. Piping Systems DRG - 045

- (a) State what item '401' at No.1 generator is and describe its function. (2)
- (b) Describe how fuel consumption of main engine and generator engine is monitored. (2)
- (c) State which of the diesel oil pumps would normally be used, if required, and explain why. (2)
- (d) Describe, using drawing references and including flow paths, how to configure the diesel oil system, to make ready and flush through No.1 generator prior to maintenance. (4)

2. Mechanical Assembly DRG - 046

- (a) Describe the type of assembly shown in the drawing and explain the advantage of this type of assembly. (2)
- (b) Using drawing references, identify the casing sections that make up the pump assembly. (2)
- (c) State the type of impellers which are used in the assembly. (2)
- (d) Using drawing references, describe how the impellers are axially and radially located and secured to the shaft. (2)
- (e) Using drawing references, identify the casing seal rings and explain their purpose. (2)

3. Ship's Construction Drawing DRG - 047

- (a) State the frame numbers between which the flat side and flat bottom of the hull start. (2)
- (b) State the total number of plate sections used to form the hull around frame number 263. (2)
- (c) State the location and thickness of the heaviest plate sections used in the hull construction. (2)
- (d) State the maximum number of plate sections used along the length of the hull, excluding bulbous bow. (2)
- (e) State the closest proximity of a plate seam to a transverse girder. (2)

4. Hydraulic and Pneumatic System Drawings DRG - 048

- (a) Describe the following, explaining its function: (2)



- (b) Describe what is indicated by the line below on the drawing. (2)

- (c) With No.2 main start air compressor not functioning, using drawing references, describe the possible system configurations which would maintain both air start systems operational. Indicate any problems associated with the new configurations. (3)
- (d) With both main starting air compressors not functioning, and no air in any bottles, using drawing references, describe the system configuration which would enable starting of No.2 generator engine. (3)

5. Electrical Power Systems and Control Drawings DRG - 049

- (a) Describe the function of the circuit shown in the drawing. (2)
- (b) State what item 'F1' is and explain its function. (2)
- (c) State what item 'T1' is and explain its function. (2)
- (d) Explain the function of the mechanical interlock. (2)
- (e) State what KA1 is and explain its function. (2)

Section B

6. Drawing 049

- (a) Describe the actions required to activate the circuit shown. Assuming supply voltages to the main and auxiliary circuits are satisfactory, explain using drawing references, the sequence of automated actions that follow which enable the circuit to fulfil its required function. (15)
- (b) When the start button is pushed a contractor is heard to operate, but when the start button is released a contractor is heard to operate again and the motor fails to start. Describe the location and type of faults that may cause this failure. (6)
- (c) Explain the main advantages of this type of circuit over other circuits designed to fulfil the same basic function. (4)

7. Drawing 046

- (a) Using drawing references, list the procedure for replacement of all major running components, except the casing and shaft. (15)
- (b) In service the pump is experiencing leakage from around the gland. Explain possible defects within the pump which could be contributing to this leakage. (10)

DRG. 048







