

HONG KONG POLYTECHNIC  
DEPARTMENT OF NAUTICAL STUDIES

---

COURSE : Certificate of Proficiency in Ship Command  
CLASS : Part B  
SESSION : 1989/90  
SUBJECT : Ship Technology  
DATE : <sup>21</sup>~~22~~ May 1990  
TIME ALLOWED : 3 hours

---

Instructions to candidates : Attempt SEVEN questions.  
This paper contains eight questions.  
All questions carry equal marks.

---

Available from  
invigilator :

---

1. List the main longitudinal structural-members comprising a ship's hull.  
List the main transverse structural-members comprising a ship's hull.  
Draw sketches of a cross-section of a large general-cargo ship through a midship cargo compartment indicating the above structural-members.
2. Describe, using sketches, the effect of sea-waves on the midship bending moment.
3. Describe, with the aid of a sketch, the process of exhaust valve scavenging using a turboblower and any other associated equipment.
4. (a) State the essential properties of a primary refrigerant.  
(b) Sketch and describe a refrigeration system for a compartment in a refrigerated cargo ship which uses a primary and a secondary refrigerant.
5. (a) State 3 main objectives of a control system.  
(b) Draw the block diagram of a basic closed-loop control system and briefly describe the function of each block.  
(c) Briefly explain the following terms with reference to the close-loop control system in (b).
  - (i) measured variable
  - (ii) desired value
  - (iii) deviation
6. (a) With the aid of block diagram describe a simple bridge remote control system for controllable pitch propeller.  
(b) What are the advantages and disadvantages of using a controllable pitch propeller.
7. "Failure Maintenance", "Preventive Maintenance" and "Planned Maintenance" are three approaches to ship maintenance. Explain each system and discuss the advantages and disadvantages of each.
8. With reference to an impressed-current system of cathodic protection for a ship's hull, *ICCP*
  - (a) briefly explain the reason for cathodic protection.
  - (b) describe the operation of an impressed-current system.