



**DIRECTORATE OF MERCHANT SHIPPING  
GOVERNMENT OF SRI LANKA  
CERTIFICATE OF COMPETENCY EXAMINATION**

GRADE : CHIEF MATE ON SHIPS OF 500 GT OR MORE (UNLIMITED)  
SUBJECT : Ship Construction  
DATE : 02<sup>nd</sup> March 2021

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Time allowed **THREE** hours Total marks : 120

**ANSWER ANY SIX QUESTIONS** Pass marks : 50%

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Formulae and all intermediate steps taken in reaching your answer should be clearly shown. You may draw sketches wherever required. Electronic devices capable of storing and retrieving are **NOT** allowed.

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- 1) With reference to Ship's drawings;
  - (a) Describe "Half block model" in Ship construction and use of that model?  
(05 marks)
  - (b) Explain below line plans with suitable diagrams;
    - i. Half breath plan
    - ii. Sheer plan
    - iii. Body plan  
(10 marks)
  - (c) Explain new technology used in Ship drawings and data preservation?  
(05 marks)
  
- 2) With reference to hatch covers;
  - (a) Explain function of Hatch covers.  
(05 marks)
  - (b) List 4 common types of Hatch cover designs in Cargo ships and briefly describe operation procedure of them.  
(10 marks)
  - (c) Sketch and explain the use of Non-Return drain valve at hatch water drainage system.  
(05 marks)
  
- 3) Describe EACH of the following, stating what component parts of the ships structure help to resist the effect.
  - a) Racking
  - b) Water pressure effect
  - c) Panting
  - d) Pounding
  - e) Dry docking stresses

(04 marks each)

- 4) a) Briefly discuss Tungsten Inert Gas Welding (TIG) and Metal Inert Gas Welding (MIG) used in Ship building. (05 marks)
- b) Explain with sketches 4 types of welding joints (07 marks)
- c) List welding defects and tests used in modern days to detect them. (08 marks)
- 5) a) Sketch the Aft construction of a ship naming all parts. (10 marks)
- b) In relation to the collision bulkhead comment on the following:
- i. Position of the bulkhead relative to the length of the ship
  - ii. Extent of the collision bulk head
  - iii. Corrugation of bulkhead
  - iv. Openings through the collision bulkhead
- (10 marks)
- 6) a) In relation to a ship survey, List the main survey schemes for Safety related certificates. (05 marks)
- b) What is the requirement of dry dock survey? (05 marks)
- c) Explain what is EDD program and how you plan for IWS. (10 marks)
- 7) a) Explain the purpose of the transverse water tight bulkheads. (06 marks)
- b) Describe using a sketch as necessary, how a turning shaft is passed through a bulkhead. (08 marks)
- c) State the minimum number of transverse watertight bulkheads and their locations. (06 marks)

8)

a) With the aid of detailed diagram list the main components of a Single swinging derrick.

(07 marks)

b) Explain mast construction of lifting appliances and arrangement of improving strength from the tank top?

(07 marks)

c) Briefly discussed below items;

i. Rigging plan

ii. Register of lifting appliances and cargo handling gear

(06 marks)

9)

a) State the purpose of fitting double bottom in ships

(05 marks)

b) Describe with the aid of diagrams, the types of floors used in construction of double bottom Longitudinally and Transversely.

(15 marks)