



**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 : 15/08/2020

Time allowed **THREE** hours

Total marks : 120

ANSWER ANY SIX QUESTIONS

Pass marks : 50%

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.

- 1) Explain with suitable sketches of following ship construction features with regarding ship building:
- a) Solid Plate Floors (06 marks)
 - b) Bracket floor (06 marks)
 - c) Duct keel (08 marks)
- 2) a) Sketch the fore end construction of a ship. (10 marks)
- b) With the aid of the sketch above (a) state how panting and pounding regions are strengthened. (10 marks)
- 3) Sketch & describe Bilge keel. The answer should include the;
- a) construction. (08 marks)
 - b) purpose (02 marks)
 - c) position (02 marks)
 - d) method of attachment (08 marks)

- 4)
- a) i) What is meant by combined framing regarding hull construction in bulk carriers.
(02 marks)
 - ii) Sketch and describe a transverse midship section of a bulk carrier constructed on a combined framing system.
(10 marks)
 - b) Ship designers often say that a bulk carrier is a rational structure with minimal amount of waste. Justify the above comment with reasons.
(08 marks)
- 5) With reference to dry docking of a vessel;
- a) Make a list of pre docking information and drawings given to dry dock authority.
(04 marks)
 - b) How the vessel is planned and prepared for dry docking?
(06 marks)
 - c) Describe the Extent of survey/items to be examined and repairs carried out in dry dock taking the advantage of dry dock occupation.
(10marks)
- 6)
- a) In relation to water tight doors below the water line;
 - i. describe the methods adopted to achieve the strength at a watertight door opening.
(05marks)
 - ii. what maintenance and inspections are carried out on above (a) doors?
(03marks)
 - b) Show following parts of a ship using a sketch of a cross section.
 - i. Sheer strake
 - ii. Bilge strake
 - iii. Keel
 - iv. Bilge keel

(02 marks each)
 - c) List down the advantage of having a deck sheer.
(04 marks)

7)

- a) Sketch FOUR types of rolled steel sections commonly employed to stiffen plating. (04 marks)
- b) State where in ship's structure the rolled sections in (a) would be employed. (04 marks)
- d) A Frame is a stiffener member attached to the inside of the hull of a ship. Explain the service rendered by it. (04 marks)
- e) What are the types of framing systems used in construction of vessels and discuss the important features related to each type of framing systems mentioned above? (08 marks)

8.

- 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 bulk head. (08 marks)
- c) State the minimum number of transverse watertight bulkheads and their locations. (06 marks)

9)

- a) Name types of rudders. (03 marks)
- b) What is meant by the term "Balanced Rudder"? (04 marks)
- c) Sketch and name a rudder pintle bearing arrangement indicating important details. (10 marks)
- d) What are the materials used in above pintle bearing arrangement? (03marks)