

**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 BOARD OPERATIONS

DATE : 24<sup>th</sup> August 2015

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Time allowed THREE hours

Total marks : 180

ANSWER ALL QUESTIONS

Pass marks : 60%

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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) Answer the following questions with regards to vessel's righting lever;
  - a) In relation to Transverse stability of a vessel explain following with suitable sketches including GZ curve where necessary.
    - i. A vessel listed
    - ii. A vessel at angle of loll
    - iii. A vessel with a heel due to permanent wind pressure

(06 marks each)
  - b) Explain in detail how vessels vanishing stability will effect according to healing arm curve.

(12 Marks)
  
- 2) In relation to Load Line convention explain following;
  - a) Explain in detail surveys subjected to load line certificate including time frame.

(15 Marks)
  - b) Explain in detail how you will prepare a vessel for Load Line renewal survey.

(15 Marks)
  
- 3) Answer the following questions with regard to cargo operations;
  - a) With reference to cargo care and ventilation explain following in detail.
    - i. Ship's Sweat
    - ii. Cargo sweat

(05 marks each)
  - b) When carrying general cargo on board ventilation plays a major role in preservation of cargo. Explain why?

(10 marks)
  - c) How do you categorize hygroscopic and non-hygroscopic cargoes?

(10 marks)

- 4) Answer the following questions with regard to ship's ballast water;
- a) Translocation of sea water through ships ballast water has grown to a sizable proportion where it has threatened the environmental balance thus causing harm to ecosystems and biodiversity at some areas. Analyze the statement giving examples.  
(10 marks)
  - b) What methods have been proposed to minimize/eliminate the adverse effects of such invasive migrant species?  
(10 marks)
  - c) What are the records to be maintained with regard to ballast water management and related operations?  
(10 marks)
- 5) With reference to tanker operations;
- a) Explain how a build up of static electricity can occur during a discharging operation of crude oil.  
(10 marks)
  - b) What measures and precautions are adopted to prevent and eliminate such a build up causing accidents?  
(10 marks)
  - c) Explain what are the main features of a shipboard oil pollution emergency plan.  
(10 marks)
- 6) With reference to international instruments, explain;
- a) how a vessel is maintained seaworthy?  
(05 marks)
  - b) explain how the responsibilities in issuance of the various certificates are delegated.  
(08 marks)
  - c) what do you understand by the harmonized system of surveys?  
(07 marks)
  - d) name the basic certificates that are carried on board a merchant vessel other than a passenger vessel.  
(10 marks)