

INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

May/ June 2017 End Semester Examinations
B.Tech. (Marine Engineering) Sixth Semester
(AY 2009-2014 batches)

Double Hull Tanker Vessels (UG11E1601/ UG11E2601)

Date: 23.06.2017

Maximum Marks: 100

Time: 3 Hrs

Pass Marks : 50

PART – A

(10 x 3 = 30 Marks)

Answer in short ALL question from this Part

1) Answer the following :

- (a) Draw neat sketch showing "Plan, Profile and Cross Section" views of a Double Hull Tanker Vessel and identify the cargo spaces and segregated ballast spaces.
- (b) Write in brief the advantages of "Double Hull Tanker Vessels" over "Single Hull Tanker Vessels".
- (c) Explain what is "Condition Assessment Scheme (CAS)".
- (d) Give reasons why "longitudinal framing system" of construction is preferred for large size Tanker Vessels instead of "transverse framing system".
- (e) Explain the terms "Hogging" and "Sagging" by showing the wave profile, positions of crests and troughs along the ship's length.
- (f) Explain what is "Crude Oil Washing system (COW)" for Tanker Vessels.
- (g) Explain with sketches the difference between "Sounding" and "Ullage" of tanks.
- (h) How "Purging" and "Gas Freeing" operations are carried out for cargo tanks of Tanker Vessels ?
- (i) What is "Shadow Diagram" used for COW system ?
- (j) Give a list of precautions which need to be taken before entering cargo

PART – B

(5 x 14 = 70 Marks)

Answer any 5 questions from this part

- 2) What are the issues which delayed induction of Double Hull Tanker design. Explain these issues in detail. (14 Marks)
- 3) Particulars of a Double Hull Tanker are as follows:
LBP = 192.0 mtr.; B(mld) = 32.4 mtr.; D(mld) = 16.6 mtr.;
and Max. Deadweight = 62,600 mt.;
- Calculate the following in compliance with MARPOL 73/78 Regulations with various amendments :
- a) Minimum mid-ship draft with segregated ballast (2 Marks)
 - b) Maximum trim by stern with segregated ballast (3 Marks)
 - c) Approximate fwd. & aft. drafts in segregated ballast condition (3 Marks)
 - d) Minimum width of double side (i.e. distance of cargo space from side shell plate) (3 Marks)
 - e) Minimum depth of double bottom (i.e. distance of cargo space from bottom shell plate) (3 Marks)
- 4) Give a list of various loads which are to be considered for structural strength calculations of a tanker and explain them. (14 Marks)
- 5) Draw transverse section of a Double Hull Tanker in way of a web frame constructed with longitudinal framing system. Write names of various structural parts to identify them. (14 Marks)
- 6) Draw schematic diagram of the cargo piping system of a tanker which has 5 cargo tanks, 2 slop tanks and a central pump room. There are 2 cargo pumps and 1 stripping pump to handle two different grades of oil without any major risk of admixture. Identify and write the names of main parts/ components and main pipelines of the system. (14 Marks)
- 7) Explain in short the rule requirements, design criteria & capacity of inert gas system of a tanker and draw a neat sketch of the system. (14 Marks)
- 8) Describe various assumptions made regarding the external and internal environment while forming the rules for double hull tanker vessel construction. (14 Marks)
