

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

December 2016 End Semester Examinations
B.Tech. (Marine Engineering) Fourth Semester

Ship Structure & Construction (UG11T1401/ UG11T2401)

Date : 29.12.2016

Time: 3 Hrs

Maximum Marks: 100

Pass Marks : 50

PART – A (3 X 10 = 30 Marks)

(Compulsory Questions)

1. (a) Draw mid ship section of a ship and differentiate between moulded Beam and Extreme Beam
- (b) With the help of a longitudinal section of a ship define Forward Perpendicular (F.P) And After Perpendicular (A.P.)
- (c) Explain with the help of a sketch the forces acting on the deck plating when the ship hull is Under Hogging condition
- (d) What is jumping clearance pertaining to a rudder? Why it is provided?
- (e) Sketch a Solid floor, and label it. What is the significance of Air holes and Drain holes?
- (f) What is the significance of Bulbous bow on a ship?
- (g) Why the diving support Vessels are provided with dynamic positioning system?
- (h) After examining a welded joint your comment is "It's a good welding". How will you justify Your comment?
- (i) What is the significance of Neutral axis in ship construction?
- (j) Why Tankers are provided with longitudinal bulk head in tanks as compared to transverse Bulk head in cargo holds of a dry cargo ships?

PART – B (5 X 14 =70 Marks)

Answer Any Five of the following

2. Draw a labelled sketch and explain the freeboard markings on a ship as per load line Convention 1966-IMO. With regard to freeboard markings

- (a) What is the importance of fresh water allowance?
- (b) Mention the requirements which needs to be complied with to ensure that the markings
Cannot be altered without the consent of the authorities. (8+3+3)
3. (a) what are the certificates compulsorily be renewed in special survey?
- (b) A ships load line certificate is valid up to 15th April, 2020. The first annual survey
was carried out on 15/06/2016 and the certificate was endorsed. When will the 2nd annual
survey be due?
When the intermediate survey can be done?
- (c) How frequently a ship needs to be dry-docked? (5+6+3)
4. (a) With regard to ship construction, the following stiffening members are available:
(i) Solid Plate floor (ii) Bracket Plate floor (iii) Half Height Girders (IV) Inter Coastal side
girders (v) Panting beam (VI) Bracket (vii) Hold frame (viii) Breast hook and (ix)
Panting stringer. You need to strengthen the fore end structure of the ship's hull, in order
to resist "PANTING FORCES". Which all members will you select? Sketch those
stiffeners and mention their spacing for the purpose.
- (b) Sketch the 'Stem' of an ocean going ship. What is soft nose part of the stem? What is the
Significance of this "soft nose"? Show the connection of the stem parts to the adjoining
Structure. (8+6)
5. (a) A General cargo ship is 150 meter long. What type of double bottom framing will you
Suggest and why? Mention the stiffeners required for the purpose and their spacing for
the Required strength in the machinery space.
- (b) Sketch and label to show the connection of the following members to the adjoining
Structure/ member. (i) Hold frame at its lower end (ii) Hawse pipe (iii) Beam knee
(8+6)
6. (a) Detail in tabular form various statutory surveys and certificates required to be maintained
On a merchant vessel. Specify regulation under which each has been issued with issuing
Authority and period of validity. (14)
7. Sketch and describe an "Unbalanced Rudder" as fitted on a fabricated stern frame (14)
8. Explain systematically the procedure of building a ship in the shipyard from design stage to
its Launching. (14)

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

B.Tech. (Marine Engineering)
Semester – IV – December 2015 End Semester Examinations

Ship Structure and Construction
Subject Code: UG11T2401/ UG11T1401

Time: 3 Hours
Date: 09.12.2015

Max Marks: 100
Pass Marks: 50

Part-A

(3x10= 30 Marks)

Compulsory Questions

1. a) Why LOA, Breadth extreme and Drafts are important dimensions?
 - b) Explain Shear stress.
 - c) Explain Longitudinal framing.
 - d) What is a Tankside bracket?
 - e) Explain features of a corrugated bulkhead.
 - f) What are the types of STERN you know?
 - g) What is a load line survey?
 - h) State features of a LNG ship.
 - i) Explain what is cable laying?
 - j) State importance of a Safety Equipment Survey.

Part-B

Answer any FIVE questions

(5 X 14 = 70 marks)

2. Discuss various stresses experienced by a ship when sailing. (14 Marks)
3. What are the various destructive tests carried out in ship construction? (14 Marks)
4. Sketch and discuss a watertight transverse bulkhead. (14 Marks)
5. Discuss role of surveyors in construction of ships. (14 Marks)
6. Draw a neat sketch of a general cargo ship and label all parts. (14 Marks)
7. How the SOLAS regulations implemented in in ship construction? (14 Marks)
8. Discuss various ship statutory certificates you know and their validity (14 Marks)

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Part-B
Answer any FIVE questions

(5 X 14 = 70 marks)

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INDIAN MARITIME UNIVERSITY
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May/June 2015 End Semester Examinations

SEMESTER – IV, B.TECH (MARINE ENGINEERING)

SHIP STRUCTURE & CONSTRUCTION (T 2401 / T 1401)

Date: 05.06.2015

Time: -3 Hrs

Max.Marks:100

Pass Marks:50

PART – A

(3 x10 = 30 Marks)

(Compulsory Questions)

1. a) Explain “Pounding” and “Panting”
- b) Why air release and drain holes are essential on solid floors?
- c) What is “Breast Hook”? Where and why is it fitted?
- d) What is a “Dynamic Positioning Vessel”?
- e) What are the advantages of “Corrugated Bulkheads” and how are they attached to the ship’s side plating?
- f) What is a “Web Frame”? Show with a sketch. Where and why are they fitted?
- g) Some bulkheads must be fitted on all ships – irrespective of the type and size of the ship. Which are these bulkheads and where on ships are they fitted?
- h) What are “Half-beams”? Where do you find them?
- i) What are “Hatch Coamings”? How are they fitted and strengthened?
- j) Name the statutory certificates and state the purpose for which they have been issued

PART – B

(5 x14 = 70 Marks)

(Answer any five of the following)

2. Show with suitable sketches and brief description the following :-
 - a) A solid floor in a longitudinally framed double bottom
 - b) A “Duct keel” arrangement in a ship
 - c) Cofferdam arrangement in Machinery space double bottom

(14)

3. a) Show with sketches how ship's side frames are attached to different decks at different Levels (7)
- b) Show the construction of a "Bulwark". What arrangements are made to reduce the amount of water coming on main deck from ship's sides during heavy rolling? (7)
4. Show with a neat sketch the arrangements provided in the fore peak region to resist panting. (14)
5. Draw an unbalanced rudder as fitted on a ship and explain how the rudder can be removed from place for maintenance. (14)
6. Show the following on diagram with short notes :- (14)
- | | | | |
|-------------|------------|--------------|----------------|
| Sheer, | Camber, | Tumble Home, | Rise of floor, |
| Bilge keel, | Freeboard, | Stem | |
7. a) What is a "Classification Society". Name a few of them. (4)
- b) Explain the role of "Classification Society" in the construction of a ship. (10)
8. Discuss the effects of various stresses on the ship's structure longitudinally and transversely when the ship is either stationary or moving. (14)

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May/June 2015 End Semester Examinations

SEMESTER – IV, B.TECH (MARINE ENGINEERING)

SHIP STRUCTURE & CONSTRUCTION (T 2401 / T 1401)

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Time: -3 Hrs

Max. Marks: 100

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PART – B

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SEMESTER – IV, B.TECH (MARINE ENGINEERING)

SHIP STRUCTURE & CONSTRUCTION (T 2401 / T 1401)

Date: 05.06.2015

Time: -3 Hrs

Max. Marks: 100

Pass Marks: 50

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(3 x 10 = 30 Marks)

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- b) Why air release and drain holes are essential on solid floors?
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PART – B
(Answer any five of the following)

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INDIAN MARITIME UNIVERSITY
(A CENTRAL UNIVERSITY, GOVT. OF INDIA)

SEMESTER- IV, B.TECH. (MARINE ENGINEERING) – JUNE 2014 EXAMS

SHIP STRUCTURE AND CONSTRUCTION (T 1401)

(AY 2009-10 to 2012-13 batches only)

Time:- 3 Hrs
Date: 19.06.2014

Max Marks : 100
Pass Marks : 50

PART - A

(3 X10 = 30 Marks)

Compulsory Questions

1. a) Define Sheer? What is the relation between Forward sheer and Aft sheer?
- b) What is fabrication?
- c) What is a web frame?
- d) What is a midship section of a ship?
- e) What is a corrugated bulkhead?
- f) Differentiate between hawse pipe and the spurling pipe.
- g) Why tonnage regulations are required?
- h) How many types of keels you know?
- i) When do we need a dynamic positioning vessel?
- j) What do you mean by harmonization of surveys?

PART-B (ANSWER ANY FIVE)

1. Describe the various stresses associated with a ship floating in water and at sea. (14 marks)
2. A describe the various non-destructive tests carried out on welds in connection with ship construction. (14 marks)
3. Draw a neat sketch of the mid-ship section of a bulk carrier and label it. (14 marks)
4. Draw and label the elevation of the fore end construction of a ship. (14 marks)
5. Draw a neat sketch and label the various areas in the layout of a shipyard. (14 marks)
6. Describe the construction of a rudder with suitable sketches. (14 marks)
7. Highlight on the following: (5 + 5 + 4 = 14 marks)
 - a. Role of International Maritime Organisation (IMO)
 - b. National authorities in regard of maritime affairs
 - c. Role of various Classification Societies

INDIAN MARITIME UNIVERSITY
TERM – END EXAMINATION – DEC '11/JAN' 12

Sub Code: UG/ME/BS/T/221
Sub Name: SHIP STRUCTURE & CONSTRUCTION
Semester: IV

Time: 0300 Hrs
Max. Marks: 100

Part A (10 × 3 = 30 Marks)
Answer all the Questions

1. a) Define the following ship's terms with sketch :- Length between perpendiculars, Tumble home & Free board.
- b) What is the neutral axis of a ship? Mention its position.
- c) Explain Intercostals, Solid floor and Cofferdam in brief.
- d) Which area of a ship experience maximum bending moments? Mention the preventive measures to minimize it.
- e) What are Coffin plate, Clipper bow and Breast hook?
- f) How many types of water tight door are found in a ship? Mention its location and purpose.
- g) What is jumping clearance of a rudder and why is it necessary?
- h) What are load line markings and its position on a ship?
- i) Explain the difference between a cargo liner ship and a tramp ship.
- j) What are the possible sources of pollution of seawater and environment by a ship?

Part B (5 × 14 = 70 Marks)
Answer five from the following

2. Explain clearly with necessary line diagram, the stresses imposed on a ship's structure when in still water and also in a seaway. (14)
3. Explain Raking, Pounding and panting with necessary sketch. Mention the preventive measures to eliminate the effect of each on the ship's structure. (14)
4. With reference to shell plating of a ship, what all factors are to be considered in the selection of plate thickness in different region of a ship? What special constructional and stiffening arrangements are required to anticipate the vessel may have to travel through ice. (14)

5. With the aid of a neat sketch, explain clearly the fore-end arrangement of a ship for windlass and anchor cables. How is the end of an anchor cable secured inside the chain locker? (14)
6. Discuss in brief the factors to be considered in assigning the freeboard of a ship in general. How the ships are divided into various categories in this respect? (14)
7. Explain systematically the procedure of building a ship in the shipyard from design work to launching. (14)
8. Give a brief description of the following types of ship with special reference to their construction and purposes:- Container ship, Passenger ship, Oil tanker & Bulk carrier.
What do you mean by dead weight and light weight of any ship? (14)

INDIAN MARITIME UNIVERSITY
TERM – END EXAMINATION – DEC '11/JAN' 12

Sub Code: UG/ME/BS/T/221
Sub Name: SHIP STRUCTURE & CONSTRUCTION
Semester: IV

Time: 0300 Hrs
Max. Marks: 100

Part A (10 × 3 = 30 Marks)
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Part B (5 × 14 = 70 Marks)
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Contest Copy

**INDIAN MARITIME UNIVERSITY
DEPARTMENT OF MARINE ENGINEERING
SEMESTER IV – JULY 2012 EXAMINATION
T/221 SHIP STRUCTURE & CONSTRUCTION**

TIME : 3 Hours

Max. marks: 100

PART – A

(3x10 = 30 Marks)

Answer all the Questions

- 1) a) Discuss the effect of “Hogging” & “Sagging” when the ship is in a seaway.
- b) Why is it very unsafe for a ship to load heavy cargoes leaving deep tank empty and machinery space at amidships?
- c) Discuss the advantages and disadvantages of “Flat Plate Keel” and a “Duct Keel”.
- d) Discuss and show with a sketch the fitting of “Docking plugs”.
- e) What are the bulkheads that a ship must have, regardless of its type and size and what are their positions?
- f) Discuss the advantages of fitting a “Bulbous bow” on a ship.
- g) Which all spaces are not measured in the calculation of “Gross Tonnage” of a ship?
- h) How do classify different types of rudder?
- i) Explain IBC and IGC codes in brief.
- j) Why all ships are to be surveyed periodically? Write the names of three major classification societies.

PART –B

(14X5 = 70 Marks)

Answer any five Questions

- 2) Draw sectional views of a ship to indicate the following and explain each in brief:-
i) Freeboard ii) Sheer iii) Camber iv) Extreme Draught v) Forward Perpendicular vi) Tumble Home vii) Bilge Radius
- 3) Why “Sections” are used in the construction of ships? How are they produced? Draw neat sketch of five different types of section used in modern ship building and mention their uses individually.
- 4) Discuss with detailed sketches, the attachment of side frames of a ship to the margin plate and to different decks.
- 5) Show the construction of “Fore Peak Tank” of a ship, showing in details the arrangement provided to resist panting and methods for strengthening the collision bulkhead.
- 6) What is the requirement of “Load Line” rules of a ship? Draw a neat sketch of Load Line markings and explain.
- 7) Sketch and describe an “Unbalanced Rudder” as fitted on a fabricated stern frame.
- 8) Give a list of statutory certificates to be carried by a merchant ship in general. Mention their validity, issuing authority, convention and survey details



INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
East Coast Road, Uthandi, Chennai-600 119.

B.Tech. (MARINE ENGINEERING)

December 2012 Examinations

FOURTH SEMESTER EXAMINATION

SHIP STRUCTURE AND CONSTRUCTION

Old Sub Code: UG/ME/BS/T/221

QP Code: T0511401

Date: 18.12.12

Max Marks: 100
Time : 3 Hrs

PART A

(3x10) = 30 Marks

Answer all the questions

1. a) Define the following ship terms with sketch: - i) Sheer ii) Draught iii) Camber
- b) How a ship structure may be subjected to vertical shearing force?
- c) Which all factors are to be considered in the selection of shell plating thickness of a ship?
- d) Explain in brief "Shear strake", "Gun whale bar" & "Bulwark" in a ship.
- e) What is a 'Bulbous bow and where is it fitted in a ship? Discuss the disadvantages of fitting it in a ship.
- f) Where do you find the collision bulkhead to be fitted in a ship? Mention its purposes.
- g) What is the main disadvantage of a double plate rudder and how can this problem be eliminated?
- h) What do you understand by "GRT" & "NRT" of a ship?
- i) Explain the advantages of a container ship over a general cargo ship.
- j) Write the names of six classification societies to conduct the ship related surveys

PART B

(14 X 5) = 70 Marks

Answer any five Questions

- 2) Illustrate the following with necessary sketch: - i) Racking ii) Pounding iii) Panting. How the deformation of a ship structure can be prevented due to their effects in each case.
- 3) Draw the circuit diagram of A.C & D.C. electric arc welding process. Explain the various types of test to be carried out on a welded joint.
- 4) In a double bottom tank construction, briefly explain with necessary sketches the supporting and stiffening arrangement of tank top plate. Also show the inner bottom plate construction to facilitate drainage.
- 5) With the aid of a neat sketch showing only the compartments concerned, explain the arrangements of windlass and anchor cables. How the end of anchor cable secured in the chain locker?
6.
 - a) Differentiate between "Balanced", "Unbalanced" & Semi balanced rudder.
 - b) With respect to rudder of a ship, briefly explain the following: -
 - i) How is the weight of a rudder supported?
 - ii) What is "jumping clearance" and why is it necessary?
 - iii) How is the area of a rudder determined for any ship? Explain 'Aspect Ratio'.
 - iv) Explain the procedure of pressure testing of double plate rudder.
- 7) Explain the requirements of Load Line Rules under the merchant shipping act 1968. Describe the Load Line Markings with a neat and proportionate sketch.
- 8) What are the sources of pollution of sea water and environment by a ship? Explain various MARPOL annexes in details. Mention the remedial measures in each case.
