Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – December 2022

Programme Name: DNS

Semester: I

Subject Code: UD11T5103

Subject Name: Ship Construction & Ship Stability

Date: 27.12.2022	Max Marks: 70
Duration: 02 Hours	Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted.
(ii) Options, if any, are specified in respective section.
(iii) Scientific Calculator is permitted.
(iv) Graph Paper sheets to be supplied by individual Institutes/Campuses.

Section A
(1 Mark for each question)

1. Deadweight of a ship is:

a. Total carrying capacity of a ship when floating in salt water at summer loadline.
b. Total mass it can carry when floating at any draft in any density.
c. Total carrying capacity of a ship when floating in fresh water at summer loadline.

2. TPC is defined as:

a. Mass required to be loaded or discharged to increase or decrease draft of ship by 1 cm in salt water.
b. Change in draft of the vessel when 100 Mt of cargo is loaded onboard.
c. Change in draft of the vessel when 10 Mt of cargo is discharged from the ship.

3. Water plane co-efficient takes into account:

a. Underwater volume of ship at any draft.
b. Water plane area of the ship at any draft.
c. Only the maximum length of the ship.

4. A homogenous rectangular log 6m x 2 m x 1 m has RD 0.6. If it floats with its largest face parallel to water, the draft in FW will be:

a. 0.4 m.
b. 0.5m.
c. 0.6m.
d. 0.8 m.

5. A vessel of 20,000 tonnes summer displacement is floating in SW at a draft of 6.5 m. If the light displacement is 4000 tonnes and present displacement at the given draft is 14000 tonnes, the deadweight aboard is:

a. 6,000 tonnes.
b. 10,000 tonnes.
c. 14,000 tonnes.
d. 16,000 tonnes.

6. Overall length of the vessel is the distance between:

a. Extreme rigid tip forward & aft perpendicular.
b. Extreme rigid tip aft to extreme rigid tip forward.
c. Between forward & aft perpendiculars.
d. Length at the Plimsol mark.

7. Rise of the deck plating at the center line athwartships, is termed as:

a. Sheer,
b. Camber,
c. Tumblehome,
d. Flare.

8. Girders are:

a. Transverse strength members on a vessel,
b. Longitudinal strength members on a vessel,
c. Strength members only below cross decks,
d. Strength members only in the fore peak tank.

9. A vessel with constant displacement moves from RD 1.015 to 1.005, her draft will:

a. Increase.
b. Decrease.
c. Remain constant.

10. Extreme draught is measured as mentioned:
a. From the lowest point of the keel till WNA,
b. From base line to the Summer loadline,
c. From lowest point of the keel to Summer loadline,
d. From base line to the tropical mark.

Section B

11. A homogenous rectangular log 6m x 2 m x 1 m has RD 0.6. If it floats with its largest face parallel to water, calculate it's draft in SW. **(2 Marks).**

12. Define Reserve Buoyancy and illustrate with diagram. **(2 Marks).**

13. Define and illustrate with suitable diagram the term "length between perpendiculars". **(2 Marks).**

14. Define and illustrate with suitable diagram "Moulded depth". **(2 Marks).**

15. Explain the term DWA and write formula to calculate same. **(2 Marks).**

Section C

Answer all the questions. (10 Marks Each)

16. Sketch neatly a profile view of a Gearless bulk carrier showing the following parts:
Forepeak store 2. Collision bulkhead 3. Double bottom tanks. 4. Bulbous bow 5. Hatch top/hatch covers 6. Topside tanks 7. Mid ship gangway 8. Steering gear compartment 9. Machinery space 10. After peak tank.
(10 Marks = 5 marks profile + 5 marks labelling of parts)

17. A ship floating in dock water of RD 1.005 has the lower edge of her Summer load line in the waterline to starboard and lower edge of Summer load line 50 mm above the waterline to port. FWA = 175 mm and TPC (SW) = 12 tonnes. Find the amount of cargo which can be loaded in order to bring the ship to the load draft in salt water.
(10 Marks)

18.

(a) Sketch the Deck Line, Plimsoll Mark & Load Lines of a ship drawing a summer draft of 7.8 mtrs & length 102 m as seen from her port side. Show all dimensions correctly. **(7 Marks)**

(b) In case of above vessel, at what distance will the Tropical mark (T) be located from the Summer draft. **(3 Marks)**

19.

(a). A box-shaped vessel 60m x 10m x 10m floats in DW of RD 1.018 at an even keel draft of 5m. Find her KB in DW of RD 1.005. **(5 Marks)**

(b). Sketch & label neatly parts of Airpipe vent head to water ballast tank. **(5 marks)**

20.

(a) Construct a displacement curve from the following data:

Draft (m)	1	2	3	4	5
Disp (t)	770	1270	1800	2400	3100

(6 Marks)

(b) Based on the above the vessel arrival draft was 1.8 m and then she loaded 2000 t of cargo and pumped out 200 t of ballast. Find her draft on sailing.
(4 Marks)