**Indian Maritime University**
**(A Central University, Govt of India)**
**End Semester Examinations – December 2023**
**Programme Name: DNS**
**Semester: I**
**Subject Code: UD115103**
**Subject Name: Ship Construction & Ship Stability - II**

Date: 20.12.2023 Max Marks: 70
Duration: 03 Hrs 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.

**Section A (Answer all questions) 10 x 1 = 10 Marks**

**True OR False**

1. Difference between load displacement and light displacement is called Deadweight of the ship.
2. Air Pipes of tanks are generally located at the opposite end of the of the filling pipes
3. Thrust is expressed in tonnes
4. Coefficient of Water Plane Area is termed as $C_w$
5. Reserve buoyancy is termed as sum of total volume of ship

**Multiple Choice**

6. The purpose of providing Camber is to:
   a. Improve the appearance of ship
   b. Help to drain off water from deck easily
   c. Reduce the volume of water coming on deck
   d. Help drain the tanks to bilges.

7. 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.

8. Air draft of the vessel is defined as:
   a. distance from water line to top of the vessel's highest point.
   b. Distance from summer load line to top of the vessels highest point.
   c. Distance from waterline to navigation bridge.
   d. All of the above.

9. A vessel with constant displacement moves from RD 1.015 to 1.005, her draft will:
   a. Increase. b. Decrease.
   c. Remain constant. d. none of this

10. The greatest breadth of the ship measured to the outside of the shell plating is known as:
    a. Extreme breadth

b. Molded breadth
c. Absolute breadth
d. None of the above

## Section B

**Short questions** **(5 x 2 = 10Marks)**

11. Explain with the help of sketch – Sheer
12. Explain the following terms
    a) Length of Parallel Middle Body
    b) Length of entrance
13. Principle of Flotation
14. Define TPC
15. Define Deadweight available.

## Section C

**Answer all questions**

16. Sketch and label profile view of Gearless Bulk Carrier vessel and label the following parts: **(10 Marks)**
    1. Forward Mast 2. Forepeak store 3. Void Space 4. Fore Peak Tank 5. Collision Bulkhead 6. Double bottom Tank 7. Cargo Hold 8. Machinery Space 9. Engine room double bottom structure 10. Gangway

17. A cylindrical drum of radius 40 cm and height 2 m weighs 200kg. Lead pellets are put in it until it floats with its axis vertical, at a draft of 1.4 m in SW. Find the mass of lead pellets in it, in kilograms **(10 Marks)**

18. A rectangular tank has a total depth of 21m and a Volume of 20600 cubic meters which includes a trunkway of depth 1m and volume 600 cubic meters. Find the ullage when 16320t of oil of RD 0.8 is loaded. **(10 Marks)**

19. **(2 x 5 = 10 Marks)**
    a. Sketch Forepeak tank and label the principal parts.
    b. A double bottom tank measures 25m x 20m x 2m. Find the thrust on the top of the tank when pressed up to a head of 14m of SW. Also find the resultant thrust on the tank bottom, and the direction that it acts if the ships draft is 10m.

20. **(7+3 = 10 Marks)**
    a. Sketch a load line mark showing freeboard, various symbols, deck line, statutory freeboard showing horizontal and vertical distances...
    b. 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.