

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – December 2022**  
**Programme Name: DNS**  
**Semester: II**  
**Subject Code: UD11T5204**

**Subject Name: Ship Construction & Ship Stability- II**

Date: 15.12.2022

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) (Use of Hindship Hyd. Particulars is permitted)

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

1. The vertical structures in the cargo hold of a container ship through while the containers are aligned and loaded easily are called \_\_\_\_\_.
2. Towards the stern of the vessel two strakes often get narrower and finally join to a single plate called the \_\_\_\_\_.
3. Gross tonnage is mostly used for
  - a) determining taxes and charges levied on a vessel.
  - b) determining applicability of various regulations.
  - c) determining how much weight a ship can grossly carry.
  - d) determining the total gross weight of the ship including cargo.
4. More buoyant force at the ends of a vessel will result in:
  - a) Hogging.
  - b) Sagging.
  - c) Virtual loss in GM.
  - d) Unstable equilibrium.
5. Hatch covers are secured to the hatch coaming using:
  - a) Cleats.
  - b) bulldog grips.
  - c) Wire slings.
  - d) Bottle-screws.
6. Choose the correct sequence:
  - a) Chain locker – hawse pipe – gypsy – spurling pipe – cable stopper.
  - b) Chain locker – cable stopper – spurling pipe – gypsy – hawse pipe.
  - c) Chain locker – spurling pipe – gypsy – cable stopper – hawse pipe.
  - d) Chain locker – spurling pipe – cable stopper – gypsy – hawse pipe.
7. The horizontal separation between the force of Gravity and force of Buoyancy, when a ship is heeled by an external force is called \_\_\_\_\_.
8. Free Surface moment depends mostly on the:
  - a) Length of the tank.
  - b) Breadth of the tank.
  - c) Sounding of the tank.
  - d) Ullage of the tank.
9. List increases with \_\_\_\_\_ of GM(F).
10. A vessel trims about the:
  - a) Amidship (mid-point of the LBP).
  - b) Centre of Floatation.

c) Centre of Buoyance.

d) Centre of Gravity.

**Section B (Answer all questions) 5 x 2 = 10 Marks**

11. Draw neat sketch of the following sections a) Offset bulb plate b) Unequal angle.
12. List the locations where can you find Fire Control Plan on board.
13. Write briefly about the sheer strake with a neat sketch.
14. Define Righting Lever with an accompanying sketch to show.
15. Define Angle of Loll with accompanying sketch to show.

**Section C (Answer all the questions) (10 x 5 =50 Marks)**

16. Sketch and label a profile view of a container ship showing holds, Double Bottom. arrangements, peak tank arrangements, wing tanks, engine room & cell guide arrangement. (10 Marks)

17. Explain the following with reference to how are they caused, which part of the ship is affected by them and what control measures are in place to counter them.

- a) Panting (5 Marks)
- b) Localised Loading (5 Marks)

18. M.V. Hindship has a GM(F) of 0.83m and FSC of 0.092m. Her drafts are 5.38m forward and 6.17m aft. She receives 150 MT of fuel oil each in No.2 DBT port and No.2 DBT Starboard. She also discharges 430t of cargo from No.3 tween deck with KG 10.2 mtrs and loads 250t cargo in No.5 Lower tween deck. Calculate her final GM(F). (10 Marks)

19. Given:

Displacement: 16000 tonnes; Density= SW; Initial list=3° to port

KM = 7.500m; KG = 6.000m; TPC= 25

Present mean draft = 8.600; Final draft = 8.800 even keel.

State how cargo to load on either side (P&S) in order to finish with 0° list.

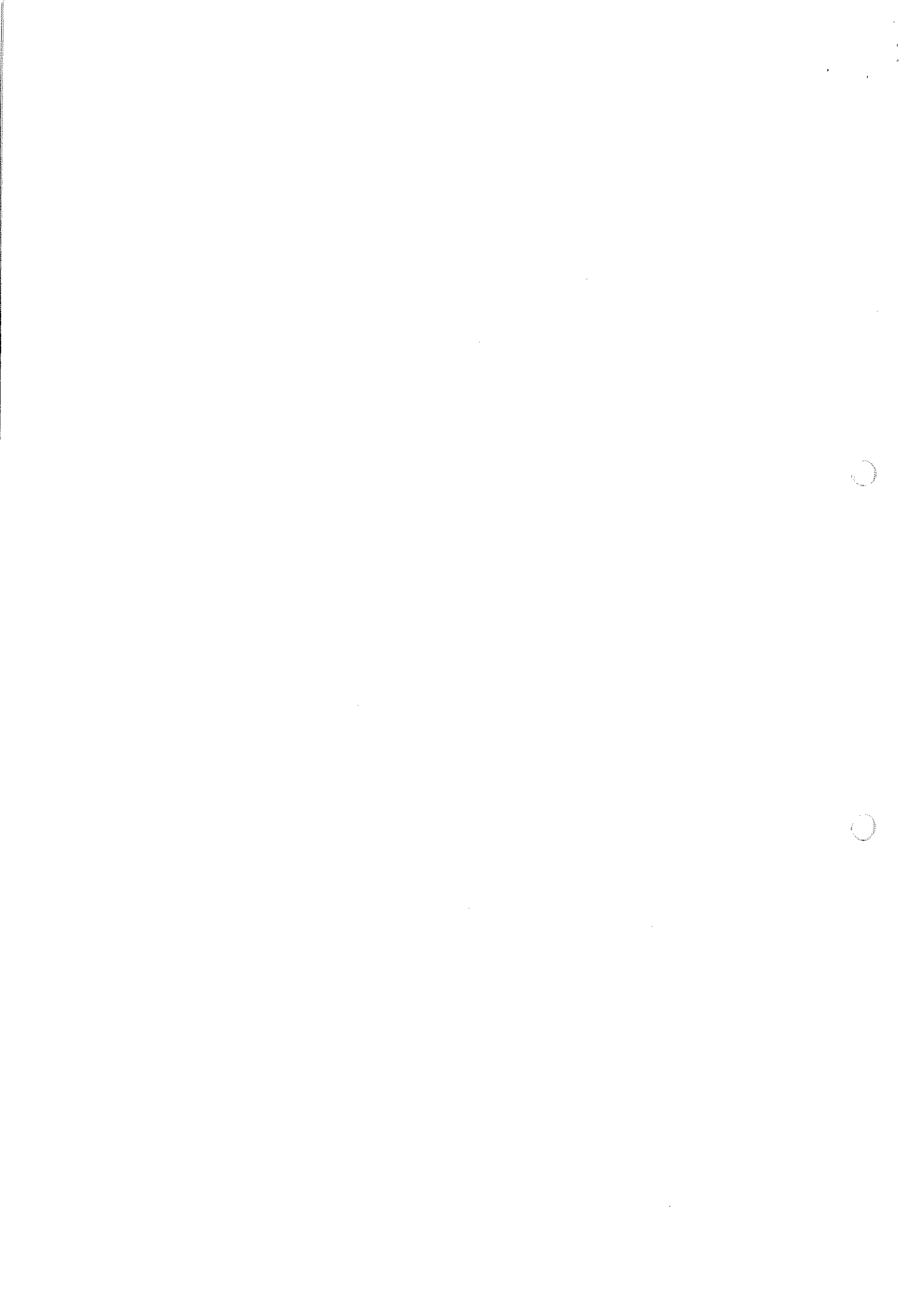
20. a) Your vessel has developed a transverse inclination to the port side at sea. Step by step explain the procedure to determine if she is listing or at an angle of Loll. (5 Marks)

b) Consider that it is now confirmed that she is at an angle of Loll to port side. State step by step in sequence the action you would take. Given the following data.

- |                   |             |                                      |
|-------------------|-------------|--------------------------------------|
| i) No. 2DBT (S)   | FSM=1500;   | SLACK (Ballast Tank)                 |
| ii) No. 2DBT (P)  | FSM=1500;   | EMPTY (Ballast Tank)                 |
| iii) No. 5DBT (P) | FSM=750;    | SLACK (HFO) can take another 150 MT. |
| iv) No. 5DBT (S)  | FSM=750;    | SLACK (HFO) contains about 160 MT.   |
| v) No. 4DBT (P)   | FSM = 2000; | EMPTY (Ballast)                      |
| vi) No. 4DBT (S)  | FSM = 2000; | EMPTY (Ballast) (5 Marks)            |

--- End of Question Paper ---

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1. With reference to DNS UD11T5204 - Ship instruction and Ship Stability II exam today AN .12.2022), the following clarification is issued with respect to Q No 19 under Section C:

2. Please read Q No 19 under Section C as follows:

"Displacement: 16000 tonnes; Density= SW; Initial  $\text{KM} = 7.500\text{m}$ ;  $\text{KG} = 6.000\text{m}$ ;  $\text{TPC} = 25$   
Present mean draft = 8.600; Final draft = 8.800 even  
l. **Space available 5m off the centre line on either**  
a. State how cargo to load on either side (P&S) in order to show with 0 list."

Thanks & Regards,

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