

B.Sc. (NAUTICAL SCIENCE)
Term-End Examination
June, 2008

BNA-024 : SHIP OPERATIONS

Time : 2 hours

Maximum Marks : 70

Note : All questions are **compulsory**. Use of calculator is allowed. Use of Hindship Tables is allowed.

1. A ship of displacement 16000 tonnes, KM 9.0 M KG 8.0 M is listed 7° to starboard. She then works cargo as below :
Loads 1600 t cargo KG 4.5 M; 5.0 M to Port
Loads 1400 t cargo KG 8.0 M; 4.5 M to Stbd
Discharges 1000 t KG 6.5 M; 1.0 M from Stbd
Find how many tonnes of ballast must be transferred transversely to upright the vessel, if the P&S tank centres are 10 M apart. 10
2. M.V. 'Hindship' floating in condition No. 2 loads 400 tonnes of cargo in No. 1 TD and on the voyage consumes the entire oil in 2 DB tanks P&S. Calculate GM (Solid and Fluid). As the change of displacement is negligible, assume FSC constant. 10

3. (a) Describe the adverse effect of free surface of liquid in a compartment. 4
- (b) What measures are taken to reduce/eliminate the free surface effect? 4
4. (a) Define any *five* : 5
- (i) Shell plating
 - (ii) Stringers
 - (iii) Frames
 - (iv) Floors
 - (v) P/V breaker
 - (vi) Bulwork
 - (vii) Bulkhead
- (b) Sketch and briefly describe the attachment of Shear strake and Stringer plate. 2

OR

Enlist the contents of undermentioned ship's plan.

- (a) General Arrangement Plan 2
 - (b) Life Saving Appliance Plan 3
 - (c) Capacity Plan 2
5. Illustrate hold bilge drainage system and related structure of a cargo/bulk carrier. What is the purpose of Non-return valve in the system? 7

OR

- (a) Explain what is meant by "pounding" and list which parts of the ship are affected.
- (b) Describe the function of the Stern frame. $2 \times 3 \frac{1}{2} = 7$

6. Write short notes on the following :

- (a) MARPOL 73/78 - Annex V 2
- (b) ISM Code 2
- (c) STCW 95 3

7. Describe the criteria to discharge Noxious Liquid Substance under MARPOL 73/78 Annex II. 7

OR

Describe the provisions of discharging the sewage from a ship into sea as provided in MARPOL 73/78 Annex IV.

8. Enlist machinery in an Engine room of a ship and draw a layout plan of Engine room. 7

9. Write short notes on :

- (i) "International Code of Signals" 4
- (ii) Functions of "Post State Control" 3

