



**DIRECTORATE OF MERCHANT SHIPPING
GOVERNMENT OF SRI LANKA**

CERTIFICATE OF COMPETENCY EXAMINATION



GRADE : OFFICER IN CHARGE OF A NAVIGATIONAL WATCH ON SHIPS OF
500 GT OR MORE (UNLIMITED)
SUBJECT : OPERATIONAL SAFETY
DATE : 06th March 2023

Time allowed THREE hours

Total marks : 180

Answer all questions

Pass marks : 60%

Formulae and all intermediate steps taken in reaching your answer should be clearly shown. You may draw sketches wherever required.

1) Briefly describe following:

- a. Gross tonnage
- b. Lower Flammable limit
- c. Breaking Stress
- d. Grain capacity
- e. Auto ignition temperature
- f. Proof load

(5 Marks each)

2) Answer following question in relation to cargo operation and cargo care :

- a) Seaworthiness of a vessel depends on several factors and lashing and securing of cargoes are one of the integral part of the seaworthiness. Failure of proper lashing and securing of cargoes leads to disasters situations at sea. Explain actions and measures to be taken if a vessel experienced a cargo shift during the course of the voyage.

(10Marks)

- b) Cargo contamination damages are one of the common issue on merchant vessels . Explain in brief situations may leads to cargo contamination.

(10 marks)

- c) Describe what are the checks to be carried out after loading on a Bulk cargo vessel.

(10 Marks)

3)

- a) Explain in detail how you perform a safe cargo watch as a duty officer on a "General Cargo vessel".

(15 Marks)

- b) Estimate the cargo loadable quantity on a vessel is having 5 identical cargo holds of L-32x B-34x D-22 is to load wheat in bulk SF 1.32cbm/t. her summer dead weight is 48265mt and weight onboard at the loading port are FO – 1020mt, DO – 164mt, FW – 178mt, constant – 450mt. Find maximum amount of wheat that she can load without overloading.

(15 marks)

4)

- a) As a duty officer to supervise container loading and discharging, describe with illustrations how you are going to identify the positions of containers on a container vessel.

(10 Marks)

- a) Describe in detail the precautions that you would take as duty officer while loading and discharging of containers.

(10 marks)

- b) List the advantages and disadvantages of container trade compared to old conventional general cargo carriage.

(10 Marks)

5) The IMDG code has been created as per the recommendations of the United Nations, panel of expert on transport of dangerous goods along with the IMO (International Maritime Organization).

- (a) Explain the principal of the IMDG code?

(10 Marks)

- (b) States the safety precautions to be taken while dealing dangerous cargo?

(5Marks)

- (c) Define the limited quantity and excepted quantity?

(10 Marks)

- (d) What is Marine Pollutant declaration and sketch the symbol of the Pollutant?

(5 Marks)

6)

- a) During tanker operations Inert gas plays a major role. Explain this statement using suitable diagrams.

(20 marks)

- b) Explain what precaution you take as OOW to prevent building up of Static electricity during tanker operations.

(10 marks)



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GOVERNMENT OF SRI LANKA**

CERTIFICATE OF COMPETENCY EXAMINATION

GRADE : OFFICER IN CHARGE OF A NAVIGATIONAL WATCH ON SHIPS OF
500 GT OR MORE (UNLIMITED)
SUBJECT : OPERATIONAL SAFETY
DATE : 07th March 2023

Time allowed THREE hours

Total marks : 180

Answer all questions

Pass marks : 60%

Formulae and all intermediate steps taken in reaching your answer should be clearly shown. You may draw sketches wherever required.

1) Briefly describe following:

- a. Gross tonnage
- b. Lower Flammable limit
- c. Breaking Stress
- d. Grain capacity
- e. Auto ignition temperature
- f. Proof load

(5 Marks each)

2) Answer following question in relation to cargo operation and cargo care :

- a) Seaworthiness of a vessel depends on several factors and lashing and securing of cargoes are one of the integral part of the seaworthiness. Failure of proper lashing and securing of cargoes leads to disasters situations at sea. Explain actions and measures to be taken if a vessel experienced a cargo shift during the course of the voyage.

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- b) Cargo contamination damages are one of the common issue on merchant vessels . Explain in brief situations may leads to cargo contamination.

(10 marks)

- c) Describe what are the checks to be carried out after loading on a Bulk cargo vessel.

(10 Marks)

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- a) Explain in detail how you perform a safe cargo watch as a duty officer on a "General Cargo vessel".

(15 Marks)

- b) Estimate the cargo loadable quantity on a vessel is having 5 identical cargo holds of L-32x B-34x D-22 is to load wheat in bulk SF 1.32cbm/t. her summer dead weight is 48265mt and weight onboard at the loading port are FO – 1020mt, DO – 164mt, FW – 178mt, constant – 450mt. Find maximum amount of wheat that she can load without overloading.

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(10 Marks)

- (b) States the safety precautions to be taken while dealing dangerous cargo?

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- (c) Define the limited quantity and excepted quantity?

(10 Marks)

- (d) What is Marine Pollutant declaration and sketch the symbol of the Pollutant?

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(10 marks)



MERCHANT SHIPPING SECRETARIAT
GOVERNMENT OF SRI LANKA
CERTIFICATE OF COMPETENCY EXAMINATION



GRADE : OFFICER IN CHARGE OF A NAVIGATIONAL WATCH ON SHIPS OF 500 GT OR MORE (UNLIMITED)

SUBJECT : COASTAL NAVIGATION

DATE : 07th March 2023

Time : 0900 to 1200 hrs

Time allowed **THREE hours**

Total marks : 100

ANSWER ALL QUESTIONS

Pass marks : 70%

Formulae and all intermediate steps taken in reaching your answer should be clearly shown. You may draw sketches wherever required. Electronic devices capable of storing and retrieving are **not** allowed.

Data and Information:

- BA Chart 5049
- Tide Graph
- Parallel Ruler
- Divider
- Deviation Card

1 Vessel to plan her next passage from Port of Le Havre, France to Port of Brixham, England via Casquets TSS. Vessel maximum draught 11.8 m, length overall (LOA) 199 m & her engine speed 16 knots. She is fitted and operational with all mandatory equipment for her size.

a) List down name of 08 number of Nautical Publications to be used for above 'Passage Planning'

(04 marks)

b) Propose a route on BA chart 5049 (English Channel) from Le Havre Pilot Boarding Ground (PBG) to Brixham Deep-Sea Pilots (near Berry Hd Light) via off Casquets Traffic Separation Scheme (TSS) complies with Rule 10 of COLREG & observing the relevant notes of BA 5049. Required information and warnings shall be marked on the chart.

(12 marks)

c) Prepare the 'Course Card' in below format,
WP – Position – Course – Distance – Distance To Go – Remarks

(04 marks)

2 a) Briefly explain with the aid of diagram,

- i) Chart Datum (CD/LAT) (02 marks)
- ii) Spring range of tide (02 marks)
- iii) Height of tide (02 marks)

b) A vessel at Bulk Terminal in Vancouver (Canada) expects to complete her cargo operations at early morning on 27th of December. Her expected sailing draught is 14.0 m and she requires to have an under keel clearance of minimum of 1.0 m. Calculate the latest time that the vessel can sail out on same day during rising tide where she has to cross a shallow patch with charted depth of 11.4 m.

Extract from the TT is as follows.

27 th December	
02 09	0.4 m
09 38	5.1 m
15 38	3.1 m
19 51	4.3 m

(09 marks)

3 a) i) Find the raising distance of C' de Antifer Lt (Fl. 27M) if the height of eye is 10m (33 feet). (05 marks)

b) At 0430 hrs Nab tower light dipped bearing 345° (T). From this position course was set by compass to pass Les Hanois light house 14.0 miles off when abeam to port.

i) Find the course to steer. (04 marks)

ii) While in the above course it was decided not to get close than 8 miles off Casquets lighthouse (height of Casquets lighthouse 40m). Calculate the vertical danger angle to set on the sextant and the ETA when Less Hanois lighthouse will be abeam. (HE-12.9m, IE-3' on the arc, speed-13 kts)

(06 marks)

- 4 a) At 0800 hrs vessel observed Horizontal Sextant Angle of 50° between Nab Tower Light House & St' Catherine Light House. And same time Nab Tower Light House bore $327^{\circ}(T)$, Fix the vessel's position at 0800 hrs. **(08 marks)**
- b) At 0800 hrs vessel course was altered to such heading and on that course Anvil Point Light House bore 4 point on STBD bow. After 12 NM distance steamed from there same light house abeam on same course at 1100 hrs. Assuming that there is no wind & current,
- i) Find the vessel's Course & beam bearing to Anvil Point Light House. **(03 marks)**
- ii) When Anvil Point Light House bore 4 point on STBD bow, fix the vessel's position & find the bearing. **(03 marks)**
- iii) Calculate her Engine Speed. **(02 marks)**
- c) In above passage vessel compass heading was $264^{\circ}(C)$, find her Deviation for that heading, taking Variation as per Compass Rose at Dover Strait. **(04 marks)**
- 5 a) On 10th January, noon position was found with Les Hanois Lt Ho bearing 070° (T), Distance 8 miles. From noon position, set course by compass to make good a course of 235° (T) counteracting a current setting 123° (T) at 4 knots and leeway of 3° . (Wind NNW force 5) **(07 marks)**
- b) Also calculate the time and distance off Les Sept. Iles Lt when abeam. (Speed 13.5 knots, Variation as per the chart. Deviation as per the card provided) **(08 marks)**
- 6 a) Briefly explain the application of Blind Pilotage. **(05 marks)**
- b) Briefly explain the risk involved with Blind Pilotage. **(05 marks)**
- c) State 05 points to be considered for Blind Pilotage Planning. **(05 marks)**
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Deviation Card			
Ship's head by compass	Deviation	Ship's head by compass	Deviation
000°	2.0° W	180°	2.0° E
010°	3.5° W	190°	3.5° E
020°	5.5° W	200°	5.0° E
030°	7.0° W	210°	7.0° E
040°	9.0° W	220°	8.5° E
050°	10.0° W	230°	10.0° E
060°	11.5° W	240°	11.0° E
070°	12.0° W	250°	12.0° E
080°	12.5° W	260°	13.0° E
090°	12.5° W	270°	12.5° E
100°	11.5° W	280°	11.5° E
110°	10.5° W	290°	10.0° E
120°	9.0° W	300°	8.0° E
130°	7.0° W	310°	6.5° E
140°	5.0° W	320°	4.5° E
150°	3.0° W	330°	2.5° E
160°	1.0° W	340°	1.0° E
170°	0.5° E	350°	0.5° W
180°	2.0° E	360°	2.0° W