



CINEC CAMPUS (PVT) LTD
Faculty of Maritime Sciences
Department of Navigation
EDUCATION & TRAINING COURSE: FOUNDATION PROGRAMME
COURSE CODE: ND-0199 BATCH 22/25

FINAL EXAMINATION – QUESTION PAPER
INTRODUCTION TO SHIPPING (ENG)

- Answer any 05 questions
- Total Marks: 100

Date: 21.09.2022

Pass mark 50%

Time allocated: 03 Hours

1. Make a detailed sketch of a ship clearly showing following principle parts.
Superstructure, portholes, main deck, bow thruster, astern thruster, anchor, stern, propeller, rudder, bulbous bow, draft, depth (air draft), port beam, stbd beam, athwart ship, navigation lights, Christmas tree, starboard side and port side. (20 marks)
2. (a) What is meant by LSA and FFA (4marks)
(b) List 5 types of items fall into each of above category. (10 marks)
(c) List down three type of emergency equipment used on board ship. (6 marks)
3. Explain following abbreviations (complete word each letter is standing for;
eg: HR = Human Resources)
(a) ETA, LSA, FFA, IMO, SOLAS, IOPP, EEBD, PPE (8 marks)
(b) List down most suitable PPE, which you should be wearing when performing work
In following areas.
(i) Working inside air bottle. (3marks)
(ii) Cleaning scavenge space. (3 marks)
(iii) Handling chemicals (3 marks)
(iv) Changing main engine cylinder head. (3 marks)
4. (a) List different type of marine propulsion system available for shipping industry.
(08 marks)
(b) Explain following terms using suitable sketches where necessary
(i) Trim
(ii) List
(iii) Rolling
(iv) Pitching

(3 marks each)

5. Write short notes on following part of a ship.

- a) Rudder (2 marks)
- b) Double bottom tank. (3 marks)
- c) Navigation Light. (2 marks)
- d) Anchor (3 marks)
- e) Void space (2 marks)
- f) Propeller (2 marks)
- g) Fire suite (3 marks)
- h) Bow thruster (3 marks)

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Department of Navigation

EDUCATION & TRAINING COURSE: Navigation Cadet Training Program – Foundation
COURSE CODE: ND-0199 – BATCH 022



FINAL EXAMINATION - QUESTION PAPER
INTRODUCTION TO SHIPPING

- Answer 05 questions.
- Formulae & all intermediate steps taken in reaching your answer should be clearly shown.
- Total Marks: 100

Date: 21.09.2022

Pass mark 70%

Time allocated: 03 Hours

1) Write short notes on following types of ships.

- a) Container
- b) Heavy Lift
- c) Bulk Carrier
- d) Oil Tanker
- e) Ro - Ro

(20 marks)

2) Describe the meaning of following nautical terms.

- | | |
|------------------|-------------|
| a) Accommodation | f) Knot |
| b) Alleyway | g) Leeward |
| c) Ballast | h) List |
| d) Bunkers | i) Trim |
| e) Deck | j) Windward |

(20 marks)

3) What are the advantages & disadvantages of container shipping?

(20 marks)

4) Write short notes on following;

- a) International Maritime Organization (IMO).
- b) International Chamber of Shipping (ICS).
- c) International Association of Classification Societies (IACS).
- d) Flag of Convenience.

(20 marks)

5) Write short notes on five busiest and most popular shipping routes for ocean-going cargo vessels.

(20 marks)

- 6) a) What is an intermodal container?
b) What is the main objective of cargo hold hatch covers?
c) How and in what state LNG is carried?
d) What is a Pure Car Carrier (PCC) and a Pure Car & Truck Carrier (PCTC)?
e) Describe briefly the ship to ship (STS) transfer operation.

(20 marks)



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FINAL EXAMINATION - QUESTION PAPER
APPLIED MECHANICS

- Answer any 05 questions
- Total Marks: 100
- $g = 9.8 \text{ ms}^{-2}$

Date: 19.09.2022

Pass mark 50%

Time allocated: 03 Hours

1.

- a) Define Path and Displacement (2 × 3 = 6 marks)
- b) A cyclist leaves home O and rides along a straight road with a constant acceleration. After 10 seconds he has reached point A with a speed 15m/s and he maintains this speed for a further 20 seconds until he reaches B before retarding (decelerating) uniformly to rest at C. The whole journey takes 45 seconds. Sketch the **velocity- time graph** for the journey and find; (5 marks)
- i) His acceleration from O to A.
 - ii) His retardation (deceleration) from B to C.
 - iii) The total distance traveled from O to C.
- (3 × 3 = 9 marks)

2.

- a) Man through a ball at $u \text{ ms}^{-1}$ at angle θ to horizontal. (gravitational acceleration as $g \text{ ms}^{-2}$). show that maximum height of projectile (H) is

$$H = \frac{u^2 \sin^2 \theta}{2g}$$

(Show your work out)

(5marks)

- b) A stone is projected upwards at 30° to the horizontal from a point 175 m above the ground, with initial velocity 20 m/s.
- How long does the stone take to reach the ground?
 - What is the range of the projectile?
 - What is the velocity of the object when it strikes the ground?
- (15 marks)

3.

- a) A 0.5 kg ball moves in a circle that is 5.0 m in radius at a speed of 30.0 m/s. Calculate,
- Angular velocity
 - Period of time
 - Frequency
 - Its centripetal acceleration.
 - The centripetal force on the ball.
- (3 × 4 = 12 marks)
- b) A mass of 2.0 kg, which may be considered to be a point mass, is attached to a string of length 0.3 m and is rotated at 8.0 rad / s.
- Calculate the moment of inertia of the mass about the axis
 - Calculate its angular momentum.

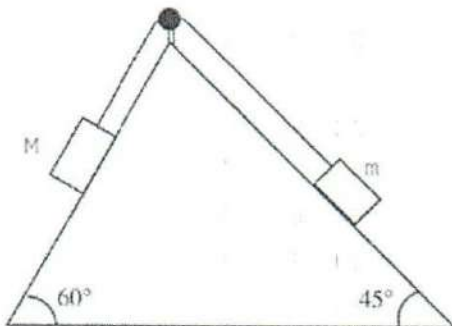
(8 marks)

4.

- a) Write the Newton's first law of motion.

(4 marks)

- b) The two masses of the system shown in the figure are $M = 5$ kg and $m = 8$ kg. You may assume that the string is inextensible, coefficient of kinetic friction between the crate and the floor is 0.25 and the coefficient of static friction is 0.3. and the pulley is a mass less smooth one.



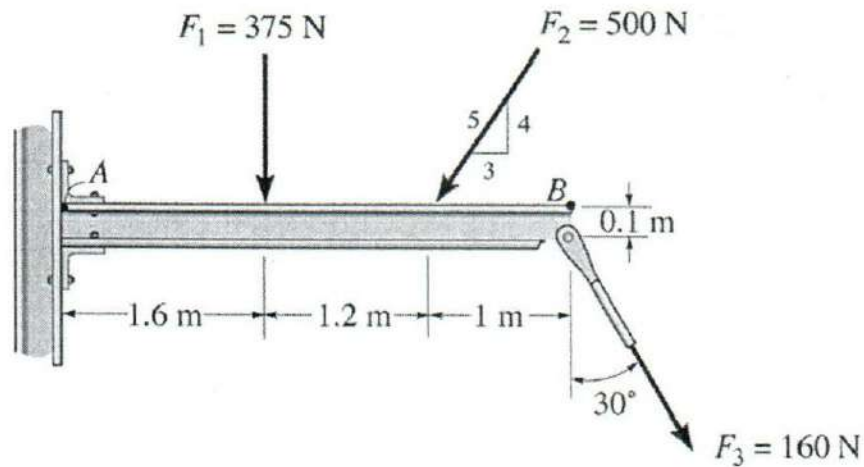
- Find the limiting friction force
- Find the acceleration of the system.
- Find the tension of the system.

(12 marks)

- c) A tractor exerts a force of 5×10^3 N on a horizontal chain while moving a load a distance of 50 cm. How much work is done by the tractor? (4 marks)

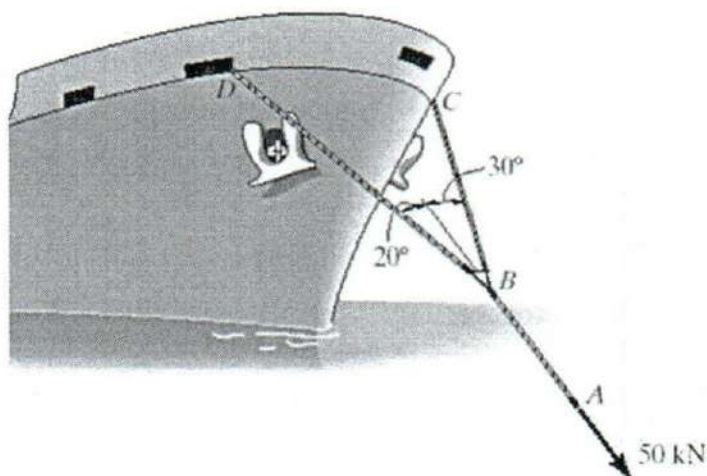
5.

- a) Determine the total moment about point A



(10 marks)

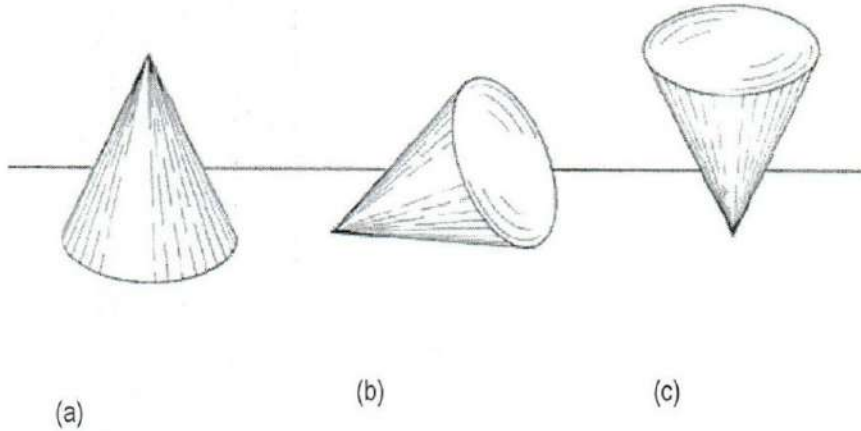
- b) The towing pendant AB is subjected to the force of 50 kN exerted by a tugboat. Determine the force in each of the bridles, BC and BD, if the ship is moving forward with constant velocity.



(10 marks)

6.

a) Determine equilibrium state of these cones.



(2 × 3 = 06 marks)

b) Center of mass in 2D two particles of mass $m_1 = 1\text{kg}$ and $m_2 = 2\text{kg}$ are located at coordinates $(1\text{m}, 2\text{m})$ and $(-2\text{m}, 5\text{m})$ respectively in the xy plane. Find the location of their center of mass

(14 marks)

7.

a) State Archimedes' principle.

(4 marks)

b) Elisabeth purchases a "gold" crown at a market. After she gets home, she hangs it from a scale and finds its weight in air to be 7.84 N. She then weighs the crown while it is immersed in water (density of water is 1000 kg/m^3) and now the scale reads 6.86 N. Is the crown made of pure gold if the density of gold is $19.3 \times 10^3\text{ kg/m}^3$?

(8 marks)

- c) A Pitot tube is an instrument used to measure airspeed of an aircraft or fluid flow in pipes. In the following schematic, the mercury is leveled because there is no air flow. When the flow starts the level on the right goes up 0.5mm (and the level on the left goes down 0.5 mm). Calculate the speed of the air if the density of air is 1.29kg/m^3 and the density of mercury is $13,600\text{ kg/m}^3$.

(8 marks)