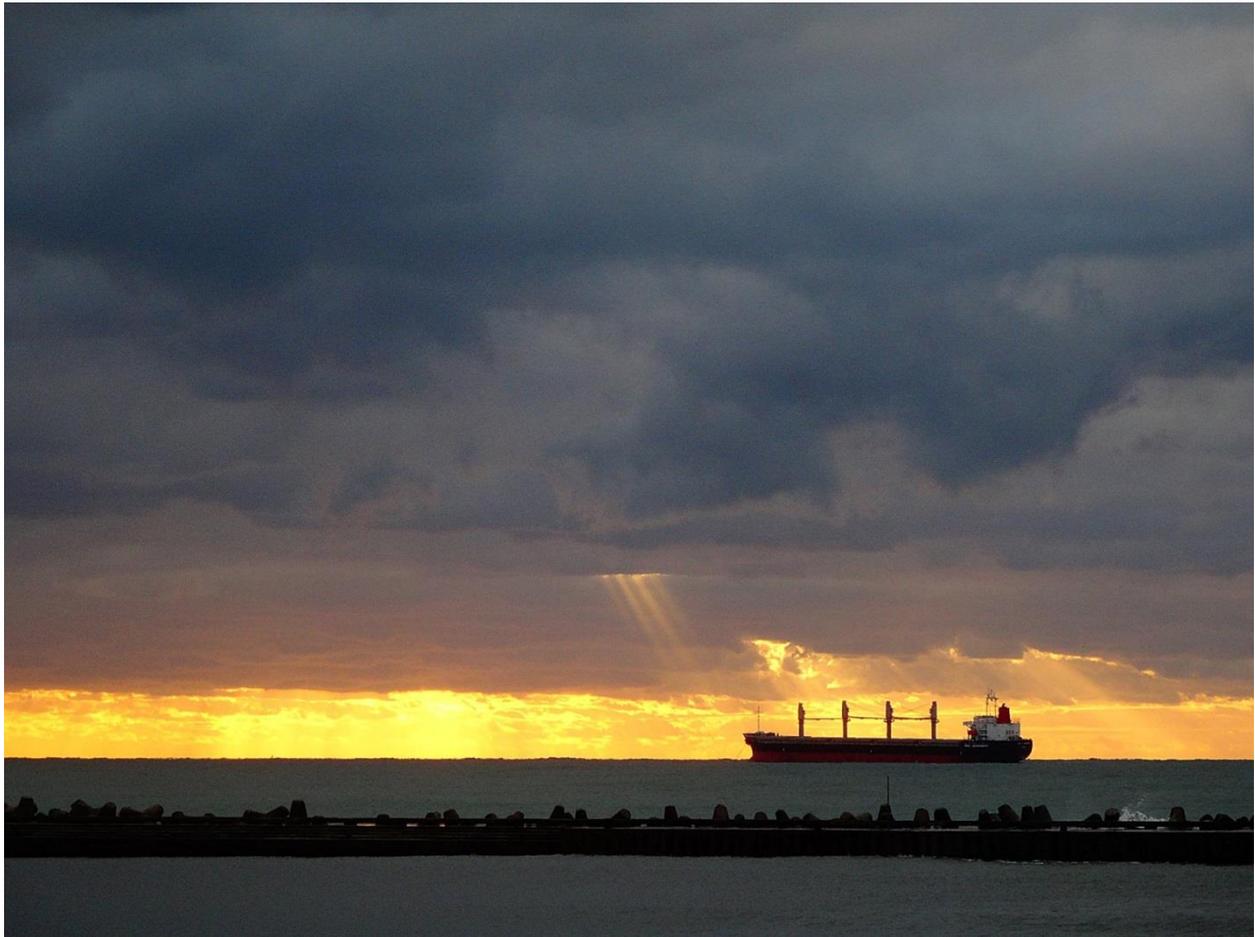


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ENGLISH
FOR
SHIP'S GENERAL ARRANGEMENT



VARNA 2018

This book is designed for use in maritime institutions to teach basic terminology related to ship construction and equipment. It is an attempt to facilitate the acquisition of this difficult language through a variety of tasks, with an emphasis on vocabulary and grammar, as well as reading skills.

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Acknowledgements

The author would like to express her gratitude to

Assoc. prof. Milena Stefanova Lefterova, PhD &

Asst. prof. Ivo Mihaylov Lazarov, Master Mariner

for their support in verifying, updating, and approving the information concerning ship design and equipment.

Publishing house "Knowledge and business"

Varna

ISBN 978-619-210-024-7

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UNIT 1

SHIP'S DESIGN AND CONSTRUCTION

Task I Purpose and Method. Answer the questions, using the information from the text:

1. Why is the hull of a cargo ship constructed with a rectangular cross section?
2. How are the many different forces on the ship's hull counteracted?
3. Why must the steel ship have a large volume compared to the weight?
4. How are the buoyancy forces on the ship's hull opposed?
5. Why are the lower portions of the hull made stronger compared to the higher portions?
6. How is the chance of flooding in case of damage to the outer hull plates reduced?
7. Why are bulkheads used?
8. How do they achieve this goal?

The Hull

The hull is the main body of the ship that floats on the water. In order to provide the maximum space to store cargo, the hull of a cargo ship is constructed with a rectangular cross section. The fore and aft centerline at the very bottom of the hull, extending the entire length of the ship is called the keel. It is made strong enough to withstand the many different forces on the ship's hull. Other portions like the corner edges (bilge keels, sheerstrake) are also strengthened.

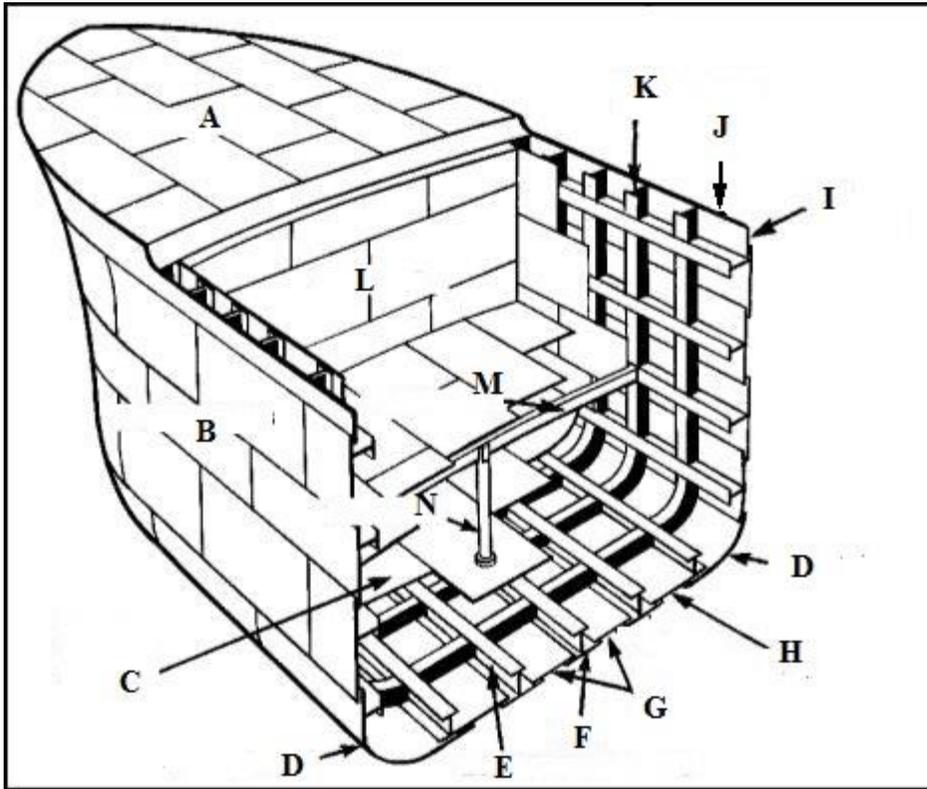
In order to float, the steel ship must have a large volume compared to the weight. The steel plates (about 10 mm thick) will not be able to resist the buoyancy forces on their own. Frames are used to support the steel plates. Some ships are framed longitudinally, while others are framed transversely. At high loading areas the frames are enlarged. These are called web frames.

The lower portions of the hull are made stronger compared to the higher portions. This is to cater for the higher loads (pressure) on the hull deeper underwater.

The bottom of the hull is made into tanks for fuel oil, fresh water, and ballast seawater. These are called double bottom tanks. This type of construction reduces the chance of flooding of the ship in case of any damage to the outer hull plates.

In case of heavy damage which punctures even the tank top plates, the ship is prevented from sinking by bulkheads. Bulkheads are continuous walls that divide the ship into many sections. The purpose of these bulkheads is to isolate the flooded sections from the rest of the ship.

Task II Label the diagram, using the information from the text:



- _____ Bulkhead
- _____ Sheer strake
- _____ Outer plating
- _____ Longitudinal frame
- _____ Deck beam
- _____ Bottom strake
- _____ Gunwale
- _____ Keel
- _____ Inner bottom plating
- _____ Stanchion
- _____ Bilge strakes
- _____ Deck plating
- _____ Transverse frame
- _____ Garboard strakes

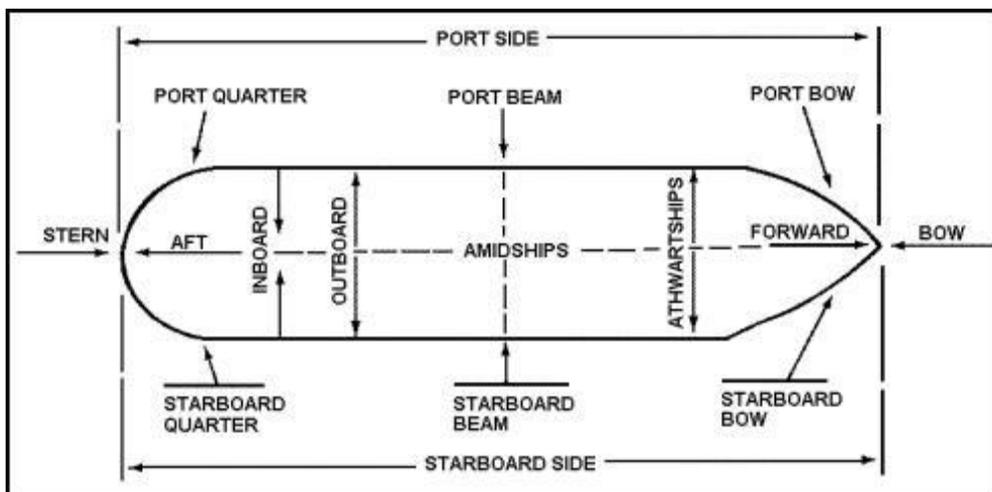
STRUCTURAL PARTS OF THE HULL

The hull is the main body of the ship below the main outside deck. The hull consists of an outside covering (or skin) and an inside framework to which the skin is secured. The skin and framework are usually made of steel and secured by welding. The steel skin may also be called shell plating.

The main centerline structural part of the hull is the keel, which runs from the stem at the bow to the sternpost at the stern. The keel is the backbone of the ship. The frames, which run athwartship, are fastened to the keel. These are the ribs of the ship and give shape and strength to the hull. Deck beams, stanchions and bulkheads support the decks and provide added strength to resist the pressure of the water on the sides of the hull.

The skin, or shell plating, provides water-tightness. The plates, the principal strength members of a ship, have various thickness. The heaviest plates are placed amidships. The others are placed so that they taper toward both ends of the ship (from the keel toward the bilge and from the bilge toward the upper row of plates). Using plates of various thickness reduces the weight of the metal used and gives the vessel additional strength at its broadest part. The plates, placed in rows from bow to stern, are called strakes. The bottom row of strakes on either side of the keel, are called garboard strakes. The strakes at the turn of the hull, running in the bilge, are bilge strakes. The strakes running between the garboard and bilge strakes are called bottom strakes and the topmost strakes of the hull are sheer strakes. The upper edge of the sheer strake is the gunwale. Extensions of the shell plating above the deck are called bulwarks.

Task III Complete the text, using the information from the figure:



SHIPBOARD DIRECTIONS AND LOCATIONS

The front end of the ship is the _____. When you move in that direction, you are going _____, when the vessel is moving in that direction, it is going ahead. When facing toward the bow, the front-right side is the _____ and the front-left side is the _____.

The central or middle area of a ship is _____. The right center side is the _____ and the left center side is the _____.

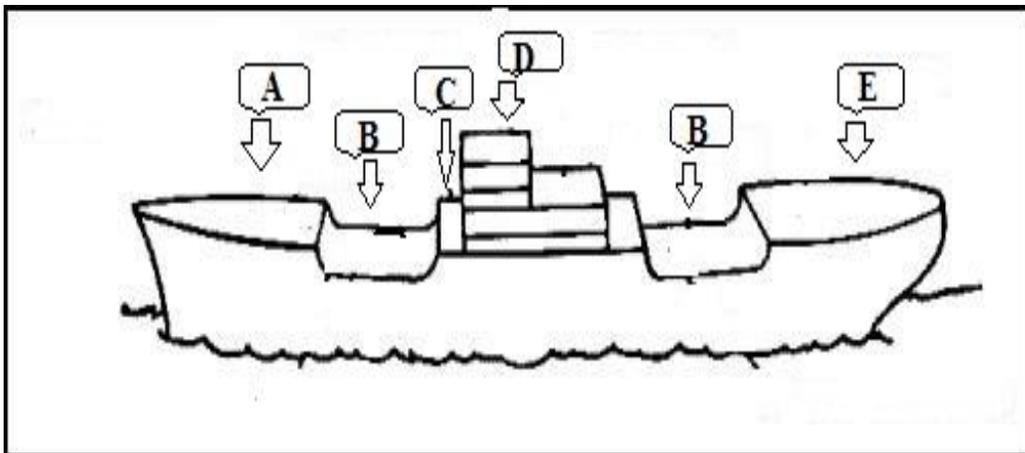
The rear end of a vessel is the _____. When you move in that direction you are going _____, when the ship moves in that direction it is going astern. When looking forward, the right-rear section is called the _____ and the left-rear section is called the _____.

The entire right side of a vessel from bow to stern is the _____ and the left side is the _____. A line, or anything else, running parallel to the longitudinal axis or centerline of the vessel is said to be fore and aft and its counterpart, running from side to side, is _____. From the centerline of the ship toward either port or starboard side is _____ and from either side toward the centerline is _____.

Task IV Label the diagram, using the information from the text:

The decks aboard ship are the same as the floors in a house. The main deck is the first continuous watertight deck that runs from the bow to the stern. In many instances, the weather deck and the main deck may be the same. Any partial deck above the main deck is named according to its location on the ship.

At the bow it is called a forecastle deck, amidships it is an upper deck, and at the stern it is called the poop deck. The term weather deck includes all parts of the forecastle, main, upper, and poop decks exposed to the weather. Any structure built above the weather deck is called superstructure.



- A** _____
- B** _____
- C** _____
- D** _____
- E** _____

Task V Read the text and find the terms to the following definitions:

1. The forward end of a ship's hull:
2. A protruding spherical underwater part of the fore end of a ship, used to reduce turbulence:
3. The foremost contour of a ship:
4. Special tanks at the fore end and the after end of a ship, used for ballast water:
5. The rear end of a ship's hull:
6. A flat after end of a ship:
7. The fore end of a ship above the waterline:
8. The raised part of a ship's hull forward:
9. A safety barrier at edges of the decks:
10. The part of the shell plating above the main deck:
11. The uppermost hull deck exposed to the weather at all times:
12. The raised part of a ship's hull aft:
13. A mechanical device for driving the ship:
14. A ship with one/two driving mechanical devices:
15. A device used for steering the ship:

The bow is the foremost part of the hull. To give it less resistance to forward motion, the bow is made into a wedge shape. Many ships feature a bulbous bow, i.e. their bows have a spherical shape at the submerged portion. The bulbous bow is constructed to give better

efficiency to the ship by streamlining the wave flow. The stem is the forward most contour part of the bow.

The bow of the ship is strengthened against slamming from the waves. The inside of the bow contains the anchor chain and the forepeak tank. The trim of the ship can be adjusted by ballasting seawater at the forepeak tank (and afterpeak tank located at the stern).

The rear part of the hull is known as the stern. Although the submerged portion is made into a streamline shape, the visible top section can be rounded or flat. Many hulls have a flat back known as transom. The stern contains the propeller, propeller shaft, stern tube, the steering gear compartment, and the rudder.

The part of the bow structure above the waterline is the prow. The general area in the forward part of the ship is the forecastle. Along the edges of the weather deck from bow to stern there are stanchions and wire ropes, called railings. Extensions of the shell plating above the deck are called bulwarks. The uppermost deck running from the bow to the stern is called the weather deck. The main deck area over the stern is called the fantail or poop deck.

Below the waterline are the propellers or screws which drive the ship through the water. The propellers are attached to and are turned by the propeller shafts. A ship with only one propeller is called a single-screw ship. Ships with two propellers are called twin-screw ships. The rudder is used to steer the ship.

Task VI Read the text and decide where each of these sentences fits in:

1. The interior of the ship is divided by bulkheads and decks into watertight compartments.
2. The engine room doors, skylight, and ventilation ducts can be sealed tight if there is a need to control a major fire in the engine room.
3. In addition to the engine room and the cargo space the hull contains several tanks.
4. Openings in the outside of the ship are portholes, not windows.
5. Most cargo hatch covers can be folded up when opened to save space.
6. If the shafting connecting the main engine to the propeller is long, there will be a shaft tunnel joining the engine room to the stern tube.
7. As the liquid cargo is pumped in and out, there are no cargo hatches, but only manhole covers and vent openings.

The floors of a ship are called decks, the walls are called bulkheads, and the stairs are called ladders. There are no halls or corridors in a ship, only passageways.

_____ Openings from one deck to another are called hatches. The portable ladder attached to the side of a ship to provide safe embarkation and disembarkation between the ship and shore is called accommodation ladder, or gangway.

_____ Bulkheads are vertically designed watertight walls within the ship's structure to avoid ingress of water in the compartment if the adjacent compartment is flooded due to damage in the ship's hull. The hull contains the engine room, cargo space and tanks.

The engine room houses all the machinery necessary for the propulsion of the ship. The area stretches from the lowest tank top of the hull to the highest funnel area.

_____ In such a case, the shafting will have to pass through the bulkhead of another compartment. A remotely operated watertight door is installed to separate the two compartments in case of flooding in one of these.

The engine room has at least two escape routes. In case of fire, flooding or any other disaster, the engine room personnel can escape through any one of them.

_____ In the areas near the accommodation, sound insulation materials are installed to dampen the noise from the machinery.

Cargo holds are spaces for carrying dry cargo. Each cargo hold is covered by a hatch cover, which can be opened for cargo handling, and closed when the ship is underway.

_____ In order to prevent water from entering the hold vertical plates, called coamings, are built around the hatchways.

Tankers have tanks instead of cargo holds.
_____ The deck above the tanks is covered with pipes and valves.

_____ The forepeak tank and afterpeak tank are used for fresh water and ballast water. The double bottom tanks are used for ballast water and fuel.

Task VII Complete the text with the words from the list:



1. lookout
2. nautical
3. deck
4. visible
5. rises
6. mark
7. also
8. extend
9. life
10. steered
11. directly
12. consists
13. external
14. highest
15. contains
16. portside
17. different
18. provide
19. engine
20. well
21. bridge
22. mounted

The Superstructure

The superstructure is a construction that _____ above the main deck. This portion of the ship is usually painted in a _____ color from the hull. Portholes are _____ whenever there is a cabin.

The bridge is the _____ level on the superstructure. This is the central _____ point on the ship, and the place from which it is controlled and _____. The wheelhouse and the chartroom are situated on the bridge. The bridge _____ the steering wheel, or helm, the autopilot, the ship's navigational and communication equipment. Charts, pilot books and other _____ publications are also carried on the bridge.

The bridge wings are narrow walkways that _____ outward from the wheelhouse to the port and starboard side of the vessel. They _____ better view of the vicinity around the ship. The monkey island is a deck located _____ above the navigating bridge. It is also referred to as the flying _____. Most of the _____ parts of the bridge equipment, such as the radar scanner, antennas, etc. are _____ there.

The accommodation of the crew can _____ be part of the superstructure. It _____ of single-berth and double-berth cabins. The galley and the messroom are located in the superstructure as _____.

The funnel is where the exhaust gas from the main _____, boiler, and auxiliary engines emerges. The funnel bears the distinguishing _____ of the shipping line.

The lifeboats are usually located one level above the main _____. For cargo ships, there are usually two lifeboats, carried in davits, one on the _____ and another on the starboard side. In addition, there will be _____ rafts on this deck and some on the bridge deck.

Task VIII Label the picture using the information from Task VII:



- A _____
- B _____
- C _____
- D _____
- E _____
- F _____
- G _____
- H _____
- I _____
- J _____

Task IX Are these statements true or false? Support your decisions with quotations from the text:

1. The distance between the intersection of the stem and waterline, and the intersection of the rearmost part of the stern and waterline is called Length between Perpendiculars.
2. The ship's extreme breadth is called beam.
3. The vessel's depth is measured from the bottom of the keel to the main deck.
4. The vertical distance from the waterline to the highest point of the vessel is called freeboard.
5. The vertical distance from the keel to the waterline is called the draft.
6. Draft is normally measured in metres.
7. Trim is the difference between draft forward and draft aft.
8. The ship is down by the stern, when her draft aft is less than her draft forward.
9. When a ship is heeling either to port or to starboard, she has a list.
10. Both trim and list can be adjusted by ballasting seawater.

SHIPBOARD MEASUREMENTS

A ship is a three dimensional structure having length, breadth, and depth. A ship's **Length Overall (LOA)** is measured from the extreme forward end of the bow to the extreme aft end of the stern. Watercraft operators must be familiar with this and similar dimensions to safely manoeuvre the ship. The dimension is commonly found in lists of ship's data for each vessel. **Length between Perpendiculars (LBP)** is the distance between the forward perpendicular which coincides with the intersection of the stem and waterline and the aft perpendicular which passes through the rudder stock. The distance between the extreme forward and aft points of the ship, where it intersects the waterline, is called **Length at Waterline (LWL)**. It is an important dimension because length at the waterline is a key factor in the complex problem of speed, resistance, and friction.

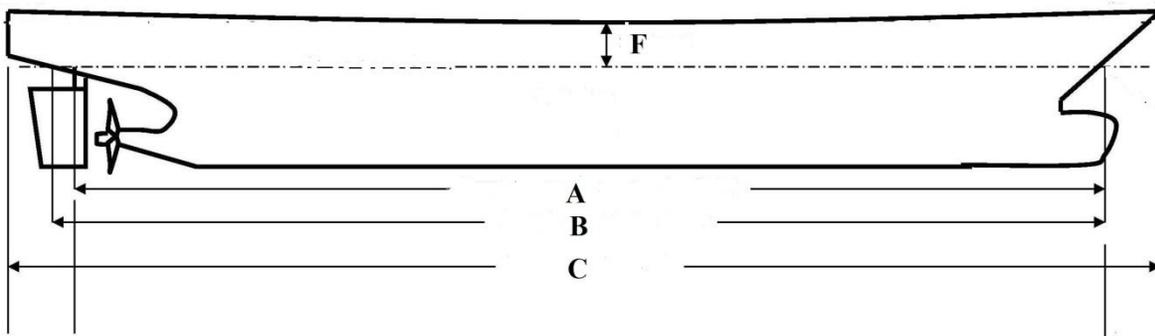
A ship's extreme breadth, commonly called beam, is measured from the most outboard point on one side to the most outboard point on the other at the widest point on the ship. This dimension must include any projections on either side of the vessel. Like length overall, this measurement is important to a ship's officer in handling the vessel.

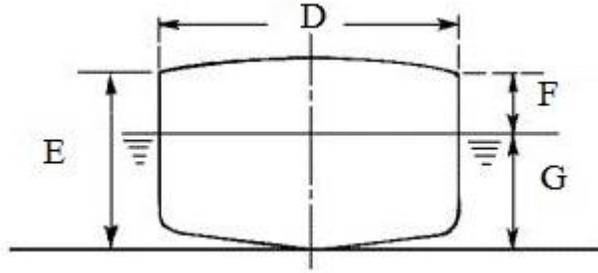
The depth of a vessel involves several very important vertical dimensions. They involve terms like freeboard, draft, draft marks, and load lines. The vessel's depth is measured vertically from the lowest point of the hull, ordinarily from the bottom of the keel, to the side of any deck that you may choose as a reference point. Therefore, it has to be stated in specific terms such as depth to upper deck amidships. It is impractical to measure depth in any other way, since it varies considerably from one point to another on many ships. Ordinarily, if such a measurement were being made in a room of a building, taken from the floor to the ceiling, it would be called height.

The waterline is the water-level line on the hull when afloat. The vertical distance from the waterline to the edge of the lowest outside deck is called the freeboard. The vertical distance from the waterline to the bottom of the keel is called the draft (draught). Airdraft (or air draught) is the distance from the waterline to the highest point on a vessel. The waterline, draft, airdraft and freeboard will change with the weight of the cargo and provisions carried by the ship. The draft of the ship is usually measured in feet and inches. Numbered scales are painted on the side of the ship at the bow and stern.

The relationship between the drafts at the bow and stern is the trim. When a ship is properly balanced fore and aft, she is in trim. When a ship is drawing more water forward than aft, she is down by the head. If the stern is too far down in the water, she is down by the stern. If the vessel is out of balance laterally or athwartship (leaning to one side), she has a list. She may be listing to starboard or listing to port. Both trim and list can be adjusted by shifting the weight of the cargo or transferring the ship's fuel and water from one tank to another in various parts of the hull.

Task X Label the diagrams, using the information from the text:





- A _____
- B _____
- C _____
- D _____
- E _____
- F _____
- G _____

Task XI Complete the table using the information from the previous texts:

ADJECTIVE	NOUN
long	
wide	
broad	
deep	
high	
strong	
thick	

Task XII Match the terms to their definitions:

DISPLACEMENT, LIGHT	The total carrying capacity of a ship, i.e. the difference between the displacement light and the displacement loaded.
DISPLACEMENT, LOADED	The entire internal cubic capacity of the ship expressed in tons of 100 cubic feet to the ton/ cubic metres, except certain spaces which are exempted, such as: peak and other tanks for water ballast; spaces above the uppermost continuous deck, such as: open forecastle, bridge and poop, anchor gear, steering gear, wheelhouse, galley and cabins for passengers.
DEADWEIGHT	A measurement obtained from the gross tonnage by deducting crew and navigating spaces and allowances for propulsion machinery. Most frequently used for the calculation of tonnage taxes.
CARGO DEADWEIGHT	The weight of the ship excluding cargo, fuel, ballast, stores, passengers, crew, but with water in boilers to steaming level.
GROSS TONNAGE	Capacity determined by deducting from the total deadweight the weight of fuel, water, stores, dunnage, crew, and other items necessary for use on a voyage.
NET TONNAGE	The weight of the ship including cargo, passengers, fuel, water, stores, dunnage and such other items necessary for use on a voyage, which brings the ship down to her load draft.

Task XIII Put the verbs into the correct form:



X Bow Hull Design vs Conventional Hull Design

A bow is the forward most part of the ship's hull which helps in **(reduce)** the resistance as the ship cuts through the waves. Bow designs have been modified several times in the past in order **(improve)** ship's efficiency and stability in sea water. The type of bow design **(use)** depends on the characteristics of the vessel, area of operation, and purpose of the ship.

X-bow is a unique bow design which **(introduce)** by the Ulstein Group of Norway in 2006. Since then the design **(receive)** great positive reviews from around the world and is now used on several vessels.

So how is X-bow design different from a conventional hull design?

X-bow is a "backward sloping bow" or an **(invert)** ship bow design which is used for **(increase)** the fuel efficiency and safety of the vessel at sea. As the name **(suggest)**, the inverted bow design has its farthest point at the extreme point of the vessel (towards the waterline) which gives a continuous sharp bow shape to the hull. The sharp design at the extreme front **(help)** the vessel to cut through the waves and improves overall stability, especially in heavy waves.

In a conventional bow design, the farthest point of the bow is at the extreme front (topmost part) of the vessel and it then tapers down, **(push)** the start of the bow backwards at the waterline. As the shape of the conventional bow is less sharp, a certain amount of energy **(use)** to push the ship forward and this considerably slows down the speed of the vessel.

According to comparative tests done by Ulstein, the X bow design with its sharp hull **(not generate)** a spray as it cuts through the waves. As the ship parts the waves efficiently, the wave energy transfer is less and the loss in vessel speed is negligible. Moreover, as the X bow cuts through the waves instead of pitching over them, there is considerably less sea water on the ship's

deck (**compare**) to the ships with conventional hulls. This also implies that there is almost negligible bow slamming of the ship.

The X bow hull design provides smoother movement of the ship with less slamming, which also makes living and working environment on the vessel better and reduces the chances of cargo shifting. According to a study, X bow design reduces the movement of the ship by almost 20% even in the roughest seas. A ship with an X bow design can thus easily (**sail**) through heavy waves with better speed and less movement. Opinions (**take**) from seafarers who have worked with X bow reflect much better living and operating conditions. Some of the officers even mentioned that unlike in ships with conventional bows, speed in X bow ships didn't require to be reduced when (**face**) rough sea weather.

X bow design was first introduced to acquire higher speed with (**reduce**) slamming and vibration problems during adverse weather conditions. However, according to the makers, the X-bow design offers several other advantages over the conventionally designed bow. Bourbon Orca was the first ship launched by Ulstein with an X bow design in 2006.

Though mainly used for offshore support and supply vessels, the X bow design (**see**) a considerable increase in demand across various types of vessels, and such bows are now designed even for container and naval ships.

Task XIV Find synonyms to the following words and expressions in the text in task XIII:

to decrease

to make better

normal

uninterrupted

fixed

greatly

to produce

because

insignificant

in addition

in this way

in contrast

turbulent sea

to get

bad weather

benefits

significant

UNIT II

SHIP'S EQUIPMENT



Task I Word formation. Use the word given in the same line to form a word that fits into the gap:

A ship _____ through the water by means of the propeller (s). A propeller is a rotating fan like structure _____ at the after end of the ship, which is used to propel the ship by _____ the power generated and _____ by the main engine.

The _____ acts like a screw when it turns in the water. It is _____ at low speeds of 60 to 150 rpm, so that the water can flow smoothly through the blades. By _____ air bubbles forming in the water, cavitation erosion on the propeller is _____.

The main _____ rotates the propeller. The propeller shaft is fitted to the propeller at one end and _____ to the main engine at the other. The propeller shaft rotates inside the oil _____ stern tube. Seawater is prevented from _____ the tube by the stern tube seals.

_____ modern ships are fitted with thrusters. A thruster (bow thruster or stern thruster) is a transversal propulsion device _____ into, or mounted to, either the bow or stern of a ship to make it more _____. Thrusters make docking _____, since they allow the captain to turn the vessel to port or starboard side, without using the _____ propulsion mechanism.

movement
situation
useful
transmission
propulsion
rotary
avoid
reduction
engineer
couple
lubricant
entrance
more
building
manoeuvre
easily
mainly

Task II Complete the sentences using the information from the text:

The purpose of the steering gear is

The necessary condition for steering gear operation is

All ships must have and

The steering gear is controlled from

The main components of the steering gear system are:

.....
.....
.....
.....

The is a hinged plate at the after end of a ship.

The is a vertical shaft whose purpose is

SOLAS requirements concerning the steering gear compartment are:

.....
.....
.....
.....

A steering gear is the equipment provided on ships to turn the ship to port side or to starboard side while in motion during sailing. The steering gear works only when the ship is in motion. All the ships are to be provided with an efficient main steering gear and an auxiliary steering gear.

The main control of the steering operations is provided from the helm of any ship. The control force for turning is triggered off from the helm, and conveyed to the steering gear. The steering gear generates a turning force which then, in turn, is transmitted to the rudderstock that turns the rudder.

The rudder is a hinged plate which can be turned a certain number of degrees either to starboard or to port. The turning of the rudder plate is done through the rudderstock. The rudderstock is a vertical shaft through which the turning force of the steering gear is transmitted to the rudder blade. It is supported at the steering gear room on bearings.

According to SOLAS requirements, the steering gear compartment shall be readily accessible and, as far as practicable, separated from the machinery spaces. Handrails and gratings or other nonslip surfaces shall be arranged to ensure suitable working conditions in the event of hydraulic fluid leakage. Emergency escape shall be arranged.

Task III Read the text and answer the questions:

Deck Equipment

Marine deck equipment is important. Almost every ship needs a crane of some sort for taking provisions and stores aboard. In addition, tankers need cranes for handling hoses, and some dry cargo ships need gear for loading and discharging cargoes.

The largest bulk carriers are almost always gearless, but ships of Panamax and below may have gear ranging from simple cranes on smaller general cargo ships to cranes capable of lifting 1,000 tonnes or more on heavy lift vessels.

As far as SOLAS goes there are no regulations concerning cranes, but their placement is taken into account at the design stage and by the class society, and all cranes are marked with a safe working load that should never be exceeded. Safe Working Load (SWL) is the maximum safe force that a piece of lifting equipment can exert to lift, suspend, or lower a given mass without fear of breaking.

Crane operation is a skilled task, and while most of the time cranes are operated by the crew, there are some ports where local labour will demand the right to operate them under local employment conditions.

From a safety point of view, the crew will need to ensure the qualifications of non-crew operators, and ensure that there is some element of supervision at all times. Older vessels may still be equipped with derricks, but these are gradually becoming obsolete.

Cranes vary enormously in design and operation, with the ship usually being fitted with a type that suits the most common cargoes. At one time most of the cranes found on ships were operated by wires for raising and lowering the jib, but today it is equally common to see hydraulic rams used instead.

Some vessels – particularly those carrying containers or packaged lumber – are fitted with travelling gantry cranes that can run the length of the cargo deck. For heavy lift ships, cranes are designed to work in tandem when handling very heavy loads.

On a ship that uses its cranes for several different types of cargo, specialist equipment is likely to be found onboard. As well as hooks and spreaders for lifting general cargo and containers, there may be clamps for lifting reels, and grabs and buckets for handling cargoes such as grain and coal.

1. Tankers need cranes
 - a. for taking provisions and stores aboard;
 - b. for handling hoses;
 - c. for both purposes.

2. Bulk carriers
 - a. are always gearless;
 - b. of Panamax and below must have cargo handling gear;
 - c. may be gearless.

3. Cranes
 - a. are always operated by the crew;
 - b. are normally operated by the crew;
 - c. are operated by local crane operators.

4. Derricks
 - a. are no longer used on ships;
 - b. are used as often as cranes;
 - c. are used less frequently than in the past.

5. Nowadays cranes
 - a. come in various designs;
 - b. are operated by wires;
 - c. are operated by hydraulic rams.

6. Bulk cargo is handled
 - a. by hooks and speaders;
 - b. by grabs and buckets;
 - c. by clamps.

Task IV Complete the text with the appropriate prepositions:



Derricks and Cranes

Derricks and cranes are both ship terms related _____ lifting appliances. Derricks are now relics _____ the past and found only _____ a few older ships. They have been replaced _____ the more versatile and much simpler deck crane.

Derricks are lifting devices composed _____ one or more masts, or king posts. Masts are vertical spars usually made _____ steel. They are installed _____ the center line of the ship. King posts, also known as Sampson posts, are vertical poles, shorter _____ masts. They are commonly installed _____ pairs, one _____ each side of the ship, _____ one or more booms attached _____ their bases.

The principal function _____ a mast or king post on a modern ship is to serve _____ a support for the cargo booms. Secondary functions are to serve _____ supports for radio antennae, signal halyards, running lights, etc.

A derrick is controlled _____ several lines connected _____ the top _____ the mast or king post, which control the lateral and vertical motion _____ the derrick. The runner up/down function to lift and lower a load is accomplished _____ a separate line similar _____ a crane.

The most popular derrick _____ ships uses two derricks enabling the operators to accomplish the loading and discharging _____ cargo much faster _____ single derricks.

One _____ the major disadvantages _____ the derrick is that it takes longer to change the rig to suit different cargo types and lifts. The operation _____ derricks also requires _____ least two winch operators.

Cranes are similar _____ derricks, but are much simpler _____ operation. A single crane driver accomplishes all functions – runner up / down, swinging sideward, etc. Most shipboard cranes are designed to swing _____ 360 degrees, but may also have safety limit switches which prevent cranes _____ operating _____ angles which can cause damage _____ structures. Limit switches are also provided to prevent the runner wire _____ reaching the end _____ the drum.

Task V Using the information from Task IV, write down ten sentences comparing derricks and cranes.



Task VI Complete the text:

Winches

A winch is a marine deck _____ for handling wires or ropes and _____ by spooling the wire or rope _____ a drum with a horizontal axis. _____ winch can be powered by electric _____ hydraulic motors; steam winches were once _____ but are now obsolete.

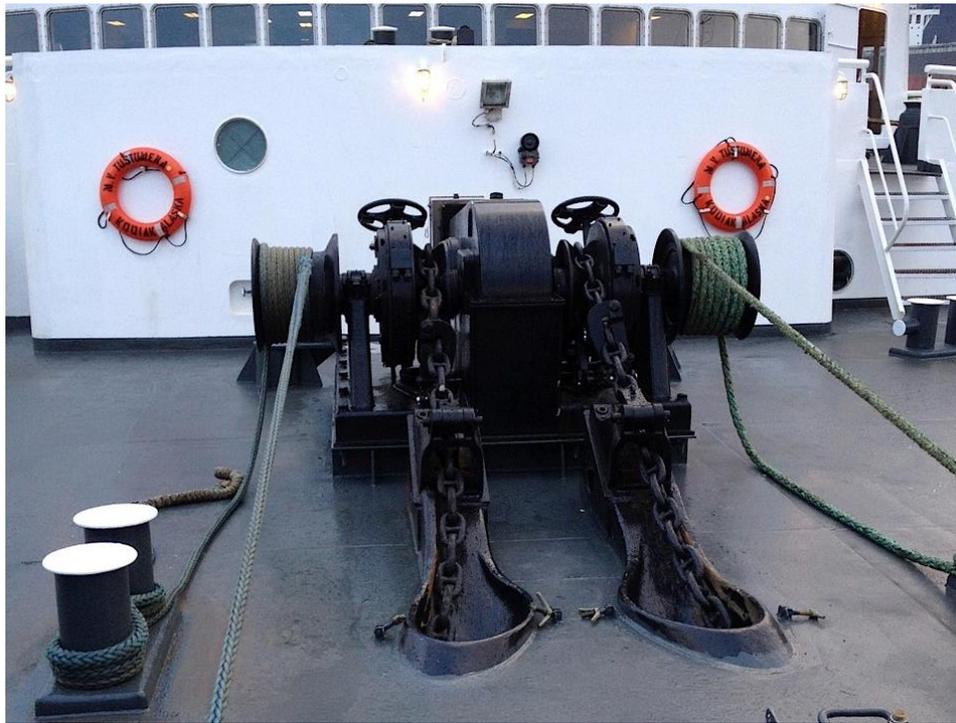
Winches on _____ are fixed and used for specific _____. As previously mentioned cargo derricks are _____ much less common, and so the _____ needed to provide power for these _____ also been more or less abandoned.

_____ most common use of a winch _____ for mooring, meaning the winches are _____ located on the fore and after _____ at both sides of the ship. _____ and offshore vessels will also be _____ with work winches designed for the _____ heavy duty work these ships are _____ for.

Winches are relatively simple pieces _____ machinery and while they can fail _____ various reasons, it is usually poor _____ and age related wear and tear _____ is the primary cause.

On most _____ the ropes from a conventional winch _____ routed through a fairlead to prevent _____ to them. The winches themselves are _____ trouble free if well maintained, but _____ to equipment that is constantly exposed _____ the worst environment and weather inevitably _____ occasionally. Most accidents that do occur _____ mooring – and there are too many _____ them – are a result of poor _____ practices and damaged ropes.

Task VII Ask questions to the underlined words and phrases:



The windlass

Located separately, but close to the mooring winches, or as an integral part of them, the windlass is the device used for lowering and raising the anchor. Technically speaking, the term "windlass" refers only to horizontal winches. Vertical designs are correctly called capstans. The windlass consists of a horizontal barrel - the cable (chain) lifter, also called gypsy, or wildcat - that is fitted with gear-like projections that engage the links of the anchor chain. It does this in tandem with the chain stopper which prevents chain slippage when anchored.

The anchor chain passes from the anchor and through the hawse pipe, over the windlass and down through the spurling pipe into the chain locker where its bitter end is secured. The windlass is driven by a motor, either electric or hydraulic, and features a brake and clutch for use in different operations.

When letting go, the anchor is lowered in controlled steps to a certain depth before being released under gravity. Limiting the height from which it is dropped is essential to stop the chain overrunning. Anchoring safely is a skill, and the speed and direction of the ship during the process is crucial.

The wheels on either a vertical or horizontal windlass provide for either chain or line to be engaged. The wheel for line is termed a warping head, while the chain handling wheel is referred to as the gypsy (in the UK) or wildcat (in North America). Nowadays, especially on large ships, the windlass may be split into independent port and starboard units. In these cases they are frequently coupled with warping drums.

Task VIII Match the pictures and the definitions:



The mooring area on a ship comprises the forward and aft parts of a vessel where winches are installed to pull the ropes from the tug and jetty bollards.

The mooring area is equipped with several devices such as winches, hydraulic motors, bollards, piping valves, anchor chains, etc. All these parts work in tandem to ensure that there is no damage when such an operation is carried out.



Chocks are structural reinforcements on ships which guide the mooring lines to and from the shore / other vessels. Chocks need to be of a much higher Safe Working Load (SWL) than the mooring line to avoid structural damage and withstand various forces when a vessel is moored. Universal Fairleads were widely used on ships earlier instead of chocks.



The **mooring winch** (warping winch) is used during mooring or loading and unloading operations to hold or keep a ship in position on dock. It is a winch with a drum which is used for hauling in or letting the mooring wires go. A warp end is also fitted to assist in moving the ship.



Pedestal Fairleads are commonly found on modern day ships to guide mooring lines between the chock and the winch. They are welded directly onto the ship's hull structure, and have a roller attached to them to guide the mooring wires for the correct lead.



Bollards are short posts on the quay / jetty used to secure ships' mooring lines.



Bitts are double bollards/posts mounted vertically on ships to secure mooring lines from other vessels (during STS operations), tug lines or secure fire wires on tankers. Bitts are always found in pairs. It is important to inform the pilot or tug operator of the SWL of the bitts to ensure that the tug does not exceed this force when pulling the vessel.



A single bitt on ships may also be referred to as a **bollard** around which the eye of the rope is attached. Oil tankers have special **cruciform bollards** in the manifold areas which are used for securing / supporting flexible hoses for cargo operations.



Dolphins are found only ashore. These are independent platforms on the jetty with hooks or bollards for securing the ship's mooring lines.

Task IX Put the words into the appropriate column:

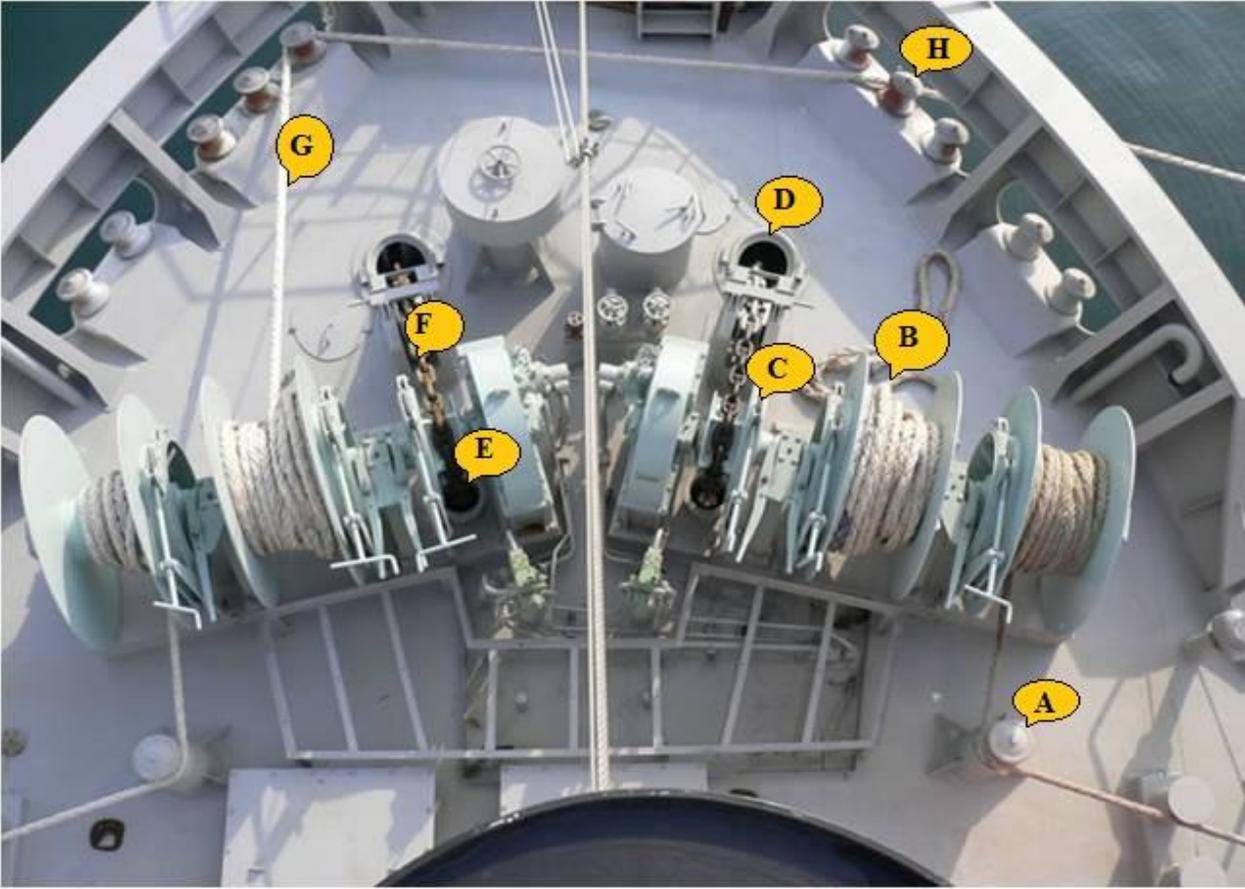
king post chock screw jib autopilot fairlead main engine
 windlass derrick rudder gypsy stern tube bitt helm thruster
 boom rudderstock cable bollard spurling pipe

propulsion	steering gear	cargo gear	anchoring gear	mooring gear

Task X Match the synonyms:

propeller	wheel
derrick	gypsy
gear	screw
king post	rope
chain	equipment
bitt	boom
helm	Samson post
wildcat	cable
line	bollard

Task XI Label the picture:



- A _____
- B _____
- C _____
- D _____
- E _____
- F _____
- G _____
- H _____

Task XII Arrange the sentences in the correct order:

1. prevented the is entering how tube from seawater?
2. wires is marine a handling deck for winch a ropes or device.
3. gradually why becoming derricks obsolete are?
4. starboard be independent windlass and split the nowadays port into may units.
5. on area does ship a mooring what the comprise?
6. when working of poor are accidents a mooring occur practices most result that.

UNIT III

GENERAL ARRANGEMENT OF DIFFERENT TYPES OF SHIPS

Task I Put the verbs into the correct form:

Cruise ships

The passenger liner, or its modern equivalent the cruise liner, exists (**provide**) a means of luxurious transport between interesting destinations for its human cargo. Cruise ships are descended from the transatlantic ocean liners, which, since the mid-20th century, (**find**) their services superseded by jet aircraft. Indeed, even into the 1990s some cruise ships (**be**) liners built in the 1950s and '60s that (**be**) adapted to tropical cruising through largely superficial alterations—e.g. the addition of swimming pools and other amenities (**suit**) warm-latitude cruising areas. However, most cruise ships now in service (**build**) after 1970 specifically for the cruise trade.

Since most cruise ships (**design**) for large numbers of passengers (perhaps several thousand), they (**characterize**) by large superstructures of many decks, and since their principal routes (**lie**) in warm seas, they are typically painted white all over. These two characteristics (**give**) them a “wedding cake” appearance that is easily recognizable from great distances. Aesthetically (**please**) lines are evident, with usually well-raked bows and unusual funnel shapes. Closer examination usually (**reveal**) a large number of life boats, as well as motor launches carried aboard for the ferrying ashore of passengers.

The above features present the principal challenge to the cruise-ship designer: (**provide**) the maximum in safety, comfort, and entertainment for the passengers. Thus, isolation of machinery noise and vibration is of high importance. (**minimize**) the rolling and pitching motions of the hull is even more important—no extreme of luxury can offset a simple case of seasickness. Stabilizers are fitted (**reduce**) rolling, and thrusters (**employ**) for improved manoeuvrability. Cruise ships sail with an average speed of 25 to 35 knots.



Task II The text has been damaged. Try to restore it. Each *x* corresponds to a letter, symbol, or interval (after . , ; there are intervals).

Ferries

Ferries are vessels of any size that carry passengers and (in many cases) their vehxxxxxxx fixed routes over short cross-water passages. The building of massive bridges and tunxxxxxxx eliminated many ferry services, but they are still justified where waters are too formidable fxxxxxxx crossings. Vessels vary greatly in size and in quality of accommodations. Some on longer ruxxxxxxx overnight cabins and even come close to equaling the accommodation standards of cruise shxxxxxxx vessels typically load vehicles aboard one or more decks via low-level side doors or by sterxxxxxxx ramps much like those found on roll-on/roll-off cargo ships.

A special type of ferry is the “double-ender,” built for shuttling across harbour watxxxxxxx typical vessel has propellers, rudders, control stations, and loading ramps at both ends. It isxxxxxxx wide enough to handle four vehicle lanes abreast and may accommodate up to 100 fourxxxxxxx vehicles. Special docks, fitted with adjustable ramps to cope with changes in water levels anxxxxxxx to fit the ends of the ferry, are always part of a ferry system of this type.

Another special type of ferry is a high-speed vessel that in many cases is of catamaraxxxxxxxx hulled) design. This type is typically found on short runs in protected waters where the carxxxxxxx vehicles is not required. Catamaran hulls can be narrow and knifelike in shape, allowingxxxxxxx operate at high speed without excessive propulsive power. The engines are usually hixxxxxxx diesels, although turbine engines have been fitted in a few instances.



Task III Read the text and answer the questions:

UK Shipyard Returns to New Ship Construction

The return of United Kingdom shipbuilding tradition and quality is currently being demonstrated in the construction of two Ro-Ro car ferries at the yard of Cammell Laird Shiprepairers & Shipbuilders Ltd. at Birkenhead, Merseyside. Building to the account of Western Ferries (Clyde) Ltd. the new ferries will replace two aging ferries in a four-vessel fleet that Western operates on a 2.2-nautical mile crossing of the Firth of Clyde.

The new ferries will be based on an already successful design of the two newer ferries built in 2001 and 2003. The two existing ferries were recognized as being of optimum capacity, speed, fuel consumption, sea-keeping capabilities and ease of operation. A spokesperson for the owners has said, "We have therefore concluded that an ideal new vessel design would logically be a reproduction of these existing craft with a few enhancements to reflect changes in applicable rules, new technology and operator experience."

The hulls of the new ferries will be 48.6 metres with beak extensions taking them to 49.95 meters overall. Similarly the moulded breadth will be 13.5 meters, but the additional sponsons will bring the beam to just over 15 meters. The moulded depth to the main deck will be 4 meters.

The new 220-passenger ferries will accommodate approximately 40 average size cars. Capable of also carrying heavy trucks, the ferries will have a clear deck height of 5.2 meters and deadweight of about 220 tonnes with a mean moulded draft of 2.5 metres. They have been designed, built and classed to Lloyd's Register of Shipping requirements, with emphasis on truly 'green' credentials that supports minimal use of hazardous materials, diminishing the potential for environmental harm as defined by the IMO. This objective will be achieved throughout the service life of the vessels by the efficient matching of the hull design to the propulsion package.

Propulsion will be by two Rolls Royce Aquamaster azimuthing thrusters, with one forward and one aft. Each independent thruster will be powered by an IMO and EU emission compliant Cummins QSK19-M diesel engine generating 600 HP or 447 Kw at 1800 RPM. This power will optimize the efficiency of the proven hull design to give the ferries a service speed, under normal conditions, of 11.5 knots.

The modern ferry is a fitting addition to Cammell Laird's long history of shipbuilding. Established in 1824, the yard has built over 1300 ships and lays claim to the first use of iron and steel in shipbuilding, first screw driven vessel, first all welded ship, and first ship with double bottom for ballast. When delivered by the Cammell Laird yard in the summer of 2013 the ferries will be the first new vessels from the historic yard in many years. At the same time they will demonstrate that the UK still has a strong and a proud presence in marine engineering.

1. Two Ro-Ro car ferries
 - a. have been built
 - b. were built
 - c. are being built.

2. Western Ferries operates
 - a. two aging ferries
 - b. four ferries
 - c. two newer ferries built in 2001 and 2003.

3. The design of the new ferries
 - a. will be completely new
 - b. will be an exact reproduction of the ferries built in 2001 and 2003
 - c. will be based on the design of the existing ferries with a few modifications.

4. The new ferries will have the following dimensions:
 - a. LOA of 48.6 metres, and moulded breadth of 13.5 meters
 - b. LOA of 49.95, and beam of just over 15 metres
 - c. LOA of 49.95, and beam of 13.5 metres.

5. The new ferries will carry
 - a. only passengers
 - b. only cars
 - c. both passengers and cars.

6. The efficient matching of the hull design to the propulsion package will result in
 - a. greater car-carrying capability
 - b. greater passenger-carrying capability
 - c. reduced risk to the environment.

7. The new ferries will be propelled by
 - a. bow thrusters and stern thrusters
 - b. bow thrusters powered by diesel engines
 - c. stern thrusters.

8. Cammell Laird
 - a. has built over 1300 ships
 - b. first used steel in shipbuilding
 - c. first built a ship with double bottom for ballast.

Task IV Complete the text with the appropriate prepositions:



Roll-on/roll-off ships

Roll-on/roll-off ships, designed _____ the carriage _____ wheeled cargo, are always distinguished _____ large doors _____ the hull and often _____ external ramps that fold down to allow rolling _____ pier and ship. Because vehicles _____ all kinds have some empty space—and _____ addition require large clearance spaces _____ adjacent vehicles—they constitute a low-density cargo that demands large hull volume. The general outline _____ the ship, _____ view _____ its relatively low density _____ cargo, is rather “boxy,” _____ a high freeboard and bridge situated forward, to afford more parking decks. The engineering plants are commonly twin engines _____ compact variety, and they are arranged so that the engine spaces are _____ either side _____ the ship, allowing valuable free space _____ them _____ vehicle passage.

When the cargo has wheels - e.g. automobiles, trucks, and railway cars - the most satisfactory cargo handling method is simply to roll it _____ and _____. Vehicle ferries have been familiar _____ many waters _____ many centuries, and the growth _____ 1960 _____ an extensive international trade _____ motor vehicles has led _____ an extension _____ the ferry principle _____ roll-on/roll-off ships, which carry automobiles strictly _____ cargo yet load and unload them _____ driving them _____ their own wheels. Ships built _____ “ro-ro” traffic are fitted _____ doors _____ the hull (most often _____ the ends), internal ramps and elevators _____ deck-_____deck transfers, and external ramps to join the hull doors _____ the pier. Often the main or only door is _____ the stern, facing directly aft and fitted _____ a massive folding ramp exterior _____ the hull. The ramp is often equipped _____ slewing - i.e. rotating, so that it can be landed _____ a pier _____ the ship.

Task V Read the text and decide where each of these sentences fits in:



1. Tankers traditionally were not fitted with double bottoms, because the breaching of a tank that is already filled with liquid is not likely to lead to the sinking of the ship.
2. The manifold is used for connecting the pipes or hoses necessary for the cargo handling.
3. The current regulatory trend is toward legal requirement of double bottoms as well as double hulls.
4. When fully loaded they are also readily distinguishable by scant freeboard—a condition that is permissible because the upper deck is not weakened by hatches.
5. The engine room and superstructure are located aft.
6. Unloading is effected in the reverse manner by pumps mounted within the ship.

Tankers

Ships that carry liquid cargo (most often petroleum and its products) in bulk are made distinctive by the absence of cargo hatches and external handling gear. Tankers are low speed vessels (average maximum cruising speed is 15.5 knots).

Since the late 19th century crude oil and its many products have been transported in bulk - i.e. without packaging. The hulls of tankers are divided into a number of tanks, into which the liquid cargo is pumped through hoses by pumps mounted on the shore.

Usually the only external cargo-handling gear is a pair of cranes or boom-post-winch sets (one

for each side of the ship) for handling the rather massive hoses that connect the ship to a shore facility.

The main deck of an oil tanker is usually mounted with a network of pipelines that are used to load and unload cargo oil to and from the ship. The catwalk is a raised bridge running fore and aft, which affords safe passage over the pipelines and other deck obstructions.

A specific feature of oil tankers is the pump room that is usually located just forward of the engine room, and houses all the pumps necessary for the cargo operations.

The oil spill that may follow a collision or grounding of a tanker is an often-disastrous feature of the petroleum age.

However, the most serious oil spills have followed from bottom damage in grounding accidents, and they would not have happened if an unbreached inner bottom had maintained tank integrity.

All oil tankers of length above 120 m are required to be double hulled, as per MARPOL rules. Panamax, Aframax, Suezmax, VLCC and ULCC tankers are all double-hulled. The primary reason for providing two hulls is to prevent the contact of cargo oil with the external environment in case of any structural damage to the hull.

Task VI Read the passage carefully and ask questions to these answers:



LNG carrier moss tanks

1. Q _____
A -260 °F (-162 °C).
2. Q _____
A Because steel cannot be used for the containers.
3. Q _____
A Aluminum or Invar.
4. Q _____
A To protect the cargo in a collision or grounding.
5. Q _____
A Aft.
6. Q _____
A Low draft and high freeboard.
7. Q _____
A Within the double hull spaces, double bottom, bilge tank, and upper wing tank spaces.
8. Q _____
A Due to the extra care in designing, maintaining, operating, and inspecting them.
9. Q _____
A A minimum distance inboard of the shell.
10. Q _____
A The inner hull.
11. Q _____
A For gas leaks.
12. Q _____
A So that no air can enter the tanks and create a flammable mixture.
13. Q _____
A Any heat ingress.
14. Q _____
A It is vented to atmosphere.

Liquefied gas carriers

Along with the great increase in numbers and size of tankers specialized uses of tankers for products other than oil have emerged. A major user is the natural gas industry. For shipment, gas is cooled and converted to liquid at $-260\text{ }^{\circ}\text{F}$ ($-162\text{ }^{\circ}\text{C}$) and is then pumped aboard a tanker for transit in aluminum tanks that are surrounded by heavy insulation to prevent absorption of heat and to keep the liquid from evaporating during the voyage. The cost of these ships is rather high, because steel cannot be used for the containers. The cold liquid, in contact with steel, would make that material as brittle as glass, therefore aluminum is used. A special nickel-steel alloy known as Invar has also been used in this application.

All Liquefied Gas Carriers have double hulls that protect the cargo in a collision or grounding. Gas carriers have a similar overall arrangement to tankers in that their machinery and accommodation are aft and the cargo containment is spread over the rest of the ship to forward where the forecabin is fitted.

The specific gravity of LPG cargoes can vary from 0.58 to 0.97 whilst LNG ships are often designed for a cargo specific gravity of 0.5, so that a characteristic of LNG ships in particular, and most LPG ships is their low draft and high freeboard. Water ballast cannot be carried in the cargo tanks, so adequate provision is made for it within the double hull spaces, double bottom, bilge tank, and upper wing tank spaces.

Due to the extra care in designing, maintaining, operating, and inspecting LNG ships, they have an excellent safety record. The double hull feature of LNG carriers and many LPG ships is a required safety feature, and the tanks of LPG ships which do not have this feature are required to be a minimum distance inboard of the shell. Fore end and aft end structure is similar to that of other ships. The cargo section is transversely or longitudinally framed depending primarily on size in the same manner as other cargo ships, the inner hull receiving special consideration where it is required to support the containment system. All gas ships have spaces around the tanks which are monitored for gas leaks and in many ships inert gas systems are fitted. Liquid gas cargoes are carried under positive pressure at all times so that no air can enter the tanks and create a flammable mixture.

Liquefaction equipment is provided aboard LPG ships, 'boil off' vapour from the tanks due to any heat ingress is drawn into the liquefaction plant and returned to the tank. Boil off vapour from LNG ship tanks can be utilized as a boiler fuel in steam ships, otherwise it is vented to atmosphere, although this is not permitted in many ports, and several other solutions have been developed to overcome this problem.

Task VII Replace the underlined words with words from the list with similar meaning:

Bulk Carriers

As their name implies, these vessels carry bulk cargoes, such as coal, iron ore, grain, etc. These vessels are single-deckers. Their hatches have very large openings so as the vessel to be loaded/discharged quickly and the holds are unrestricted and free of obstacles. Due to the bulk nature of the cargo they load, the holds of these vessels have been constructed to be “self-trimming” to allow the easy and rapid stowage and trimming of the bulk cargoes. In contrast to the general cargo vessels which can load several different cargoes, cargo in bulk carriers is usually homogenous.

The general arrangement of a typical bulk carrier shows a clear deck with machinery aft. Large hatches with steel covers are designed to facilitate rapid loading and discharge of the cargo. Since the bulk carrier makes many voyages in ballast a large ballast capacity is provided to give adequate immersion of the propeller. The average speed for bulk carriers is 13 to 15 knots.

Except for equipment to open or remove hatch covers, most bulk carriers are without cargo gear. The loading of dry bulk commodities is nearly always done from special shore facilities that pour them from a high elevation directly into the cargo holds of the ship. Discharging is done by grabs, conveyor belt systems, or, in the case of grain and similar light cargo, by suction. However, some bulk carriers are built as self unloaders, either by the provision of derricks or cranes with grabs, or by special conveyor belt systems running under the holds.

1. unlike
2. devices
3. as
4. yet
5. unobstructed
6. the same
7. unloading
8. cargo
9. available
10. loose
11. passing
12. help
13. suggests
14. gearless
15. built
16. for example
17. at the stern
18. fast



Gearless bulk carrier



Geared bulk carrier

Task VIII Choose the appropriate word:

General cargo ships

The most popular ship of the past - the general cargo ship - continues to be built, (1) in modest numbers. Those (2) in the last third of the 20th century are usually fitted with deck cranes, which give them an appearance (3) from the more-specialized ship types.

General cargo vessels are usually built in small sizes of about 5,000 to about 25,000-ton deadweight (dwt). Modern general cargo vessels are (4) always built with two decks and they are known as “tweendeckers”. In tweendeckers, each cargo hold can be split in two (5) sub-compartments: between the main deck and the tweendeck, there is the tweendeck space (or upper cargo hold), while (6) the tweendeck there is the main cargo hold (or lower cargo hold). Tweendeckers have two main advantages compared to the single decker vessels: firstly, they are equipped with more individual cargo compartments, and (7) they can carry several different cargoes, which can be kept separate from each other so as to avoid contamination, and secondly, they can accommodate higher tiers of bagged/baled cargoes with (8) their heavy weight in two different decks. At the same time, tweendecks can be retractable and fold against the sides of the hold so as to facilitate the loading of bulk commodities into single holds.

The usual cargo (9) practice on general cargo ships as it developed into the 20th century was to fit at least one pair of booms to serve each cargo hatchway, with each boom (10) by rigging from a king post. The booms were operated by winches mounted at the base of the king post. This system was gradually replaced by cranes, and remained in favour only for handling very heavy objects. Modern general cargo ships are also equipped with special container fittings and (11) to load containers. (12), nowadays general cargo vessels are more accurately called “multi-purpose” vessels.

1. a. therefore b. though c. thus
2. a. to be built b. building c. built
3. a. distinct b. distinguished c. distant
4. a. near b. nearly c. close to
5. a. different b. various c. variable
6. a. above b. over c. beneath
7. a. since b. so as c. thus
8. a. shared b. sharing c. being shared
9. a. stowage b. handling c. shipment
10. a. supporting b. support c. supported
11. a. can b. are able c. are capable
12. a. However b. Therefore c. In result



Task IX Complete the table where possible. More than one word may be possible.

VERB	NOUN	ADJECTIVE	ADVERB
	precision		
stabilize			
			excessively
	range		
		characteristic	
	majority		
reduce			
		dependent	
			highly
	location		
		standard	
continue			
	ability		
			visibly
terminate			
		structural	

Task X Complete the text with words from Task IX. Use one word from each row of the table. Put the words into the correct form:

Container ships

Like tankers, container ships _____ by the absence of cargo handling gear, in their case reflecting the usual practice of _____ the container-handling cranes, such as gantry cranes, at shore _____ rather than aboard ship. Unlike the tanker, container ships require large hatches in the deck for handling the cargo, which consists of _____ containers usually either 20 or 40 feet in length. Nowadays, container ships are usually equipped with no hatches. That is, the ship has no _____ main deck running the full breadth of the ship. This open box-like _____ enables easy stowage of containers from the tank top to the highest level above main deck level. Belowdecks, vertical guide rails divide the cargo holds into cells that are sized _____ to hold stacks of containers. The ship is filled to the deck level with containers, and several layers of containers, _____ upon the size and _____ of the ship, are loaded above the main deck level.

The containers loaded above the deck and forward of the navigation bridge are to be loaded so that the _____ from the bridge is not affected. That is why, when you look at a loaded container ship, the stack of containers forward of the bridge decreases in _____ as one moves to the forward-most stack. This, however, _____ the total amount of containers that can be carried by the ship. Hence, many ultra large container ships (e.g. Maersk Triple E class) have their superstructures shifted to the midship, in order to be _____ to accommodate containers to full height aft of the superstructure.

Container vessels _____ in size from as small as those with capacity of about 500 TEU to as large as those with capacity of about 22,000 TEU. The smaller container vessels are used as feeders sailing between _____ container terminals and may be geared, while the largest containerships are usually gearless and can achieve speeds which _____ 25 knots.



Task XI Using the information from the previous texts decide which types of ships are shown on the figures below:











Task XII Put the words into the appropriate column:

self-trimming holds aluminum tanks derricks large hull volume
 manifold engine spaces at either side of the ship guide rails low freeboard
 lower hold large superstructures of many decks liquefaction equipment
 cellular holds amenities containment system catwalk grabs
 tweendecks conveyor belt systems a large number of life boats deck cargo
 pipelines stabilizers large doors in the hull moss tanks king posts
 unobstructed holds gantry cranes ramps

Passenger ships	Ro-Ro ships	Oil tankers	Gas carriers	Bulk carriers	General cargo ships	Container ships

Task XIII Paraphrase the sentences:

1. Large amounts of superstructure are an interesting feature of passenger ships.

Passenger ships

2. The building of massive bridges and tunnels has eliminated many ferry services.

Since

3. Tankers are characterized by the absence of cargo hatches and external handling gear.

There

4. The cost of LNG carriers is rather high, because steel cannot be used for the containers.

Steel

5. Due to the extra care in designing, maintaining, operating, and inspecting LNG ships, they have an excellent safety record.

The excellent safety record

6. General cargo ships are equipped with more individual cargo compartments, and thus they can carry several different cargoes.

Several different cargoes

7. Container ships require large hatches in the deck for handling the cargo.

In order

8. These vapours, being highly inflammable, are not allowed to accumulate in the cargo tanks.

As

Task XIV Arrange the sentences in the correct order:

1. vehicles all carry ferries do?
2. distinguished low be freeboard by tankers can their.
3. be ramps ships can with Ro-Ro bow fitted?
4. absence the ships handling are by gear of characterized cargo container.
5. adequate the provided how propeller is immersion of?
6. means interesting between cruise transport a ships provide of luxurious destinations.

Task XV Complete the table using the information from the previous tasks:

Type of ship	Hull	Super structure	Propulsion	Speed	Cargo	Cargo space	Cargo gear
Cruise ship							
Ferry							
Ro-Ro ship							
Oil tanker							
LNG/LPG							
Bulk carrier							
General cargo ship							
Container ship							

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