

**CHECK YOU PROGRESS  
MED3**

**NAME:**  
[\(answers\)](#)

**Question 1.**  
List six engine room pre-departure checks on a vessel with a diesel motor.

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**Question 2.**  
List in order and describe the details of your checks to investigate the reason why your diesel motor is apparently mechanically sound but is sluggish to turn over when the starter motor is engaged.

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**Question 3.**  
List the two most common reasons for a diesel engine to turn over readily with the starter activated but still fail to start.

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**Question 4.**

With the engine at its operating temperature, the colour of these exhaust gasses would indicate:

Symptom	Cause
1. Black smoke	
2. Blue smoke	
3. White exhaust vapour	

**Question 5.**

List three possible causes of an overheating engine. Describe what action you would take to avoid engine damage in each case

Cause	Action
1.	
2.	
3.	

**Question 6.**

List a possible cause of each of the symptoms tabled below.

Symptom	Cause
1. Each time the engine starts readily but quickly fails after a few moments.	
2. There is a milky white scum in the header tank cap.	
3. There is excessive consumption of oil.	
4. There is low compression in one of the cylinder heads.	
5. The oil pressure is very high.	

6. The oil pressure is very low.	
7. The raw water cooled exhaust discharge becomes excessively loud.	
8. The stuffing box becomes excessively hot.	
9. Water keeps collecting in a sealed fuel tank.	
10. The motor has excessive vibration and runs irrationally.	

**Question 7.**

What is the:

- a. Flash point of diesel \_\_\_\_\_
- b. Flash point of petrol \_\_\_\_\_
- c. Operating temperature of a diesel motor \_\_\_\_\_
- d. Specific gravity of a fully charged batteries electrolyte \_\_\_\_\_
- e. Specific gravity of a fully discharged batteries electrolyte \_\_\_\_\_
- f. Voltage over twin 12 volt batteries connected in series \_\_\_\_\_
- g. Voltage over twin 6 volt batteries connected in parallel \_\_\_\_\_
- h. Watts per hour used by a 2 amp light globe in a 12 volt circuit \_\_\_\_\_
- i. Explosive gas emitted by charging batteries \_\_\_\_\_
- j. Poisonous gas emitted by salt water contaminated batteries \_\_\_\_\_
- k. Colour of a wet chemical fire extinguisher \_\_\_\_\_
- l. Purpose of a glow plug \_\_\_\_\_
- m. Purpose of a turbocharger aftercooler \_\_\_\_\_
- n. Revolutions of a crankcase to each work cycle in a two stroke motor \_\_\_\_\_

**Question 8.**

Sketch the pump type below to explain its operation and give an example of its use.

a. Impeller pump \_\_\_\_\_

b. Centrifugal pump \_\_\_\_\_

c. Piston pump \_\_\_\_\_

d. Diaphragm pump \_\_\_\_\_

**Question 9.**

a. Two 12 volt batteries joined in parallel now produce 24 volts.

**True / False**

b. A screw lift valve only allows fluid to travel in one direction.

**True / False**

c. Foam extinguishers can be used on electrical fires.

**True / False**

d. Fuel is injected once for each revolution of the crankshaft of a four stroke motor.

**True / False**

**Question 10.**

a. L.P.G. is lighter than natural gas.

**True / False**

b. Blue exhaust smoke indicates unburnt fuel.

**True / False**

c. Petrol is lighter than water.

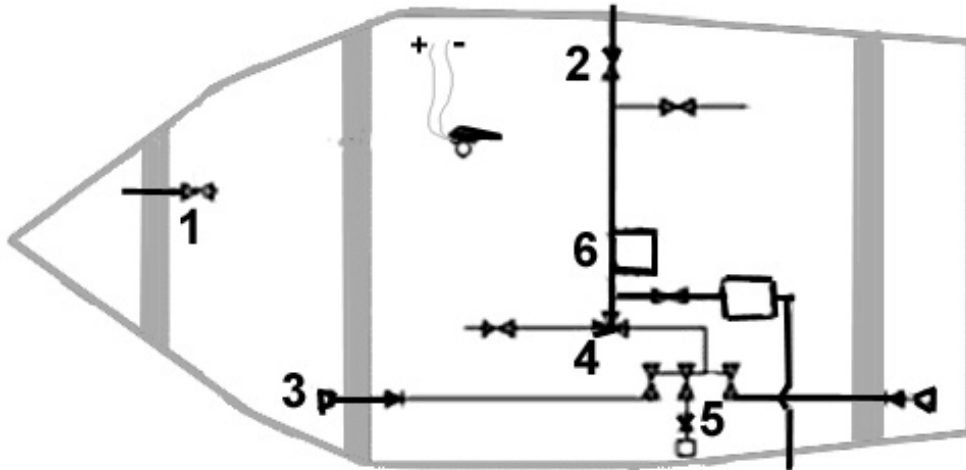
**True / False**

d. The crankshaft turns twice each work cycle of a two stroke engine.

**True / False**

**Question 11.**

Label the typical components of a small vessels bilge system drawn below and marked 1 – 6.



What is the survey specification for bilge water alarms in an engine room?

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**Question 12.**

Name and describe the typical applications of three different types of valves?

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**Question 13.**

Describe the maintenance checks regularly carried out on the equipment shown below.

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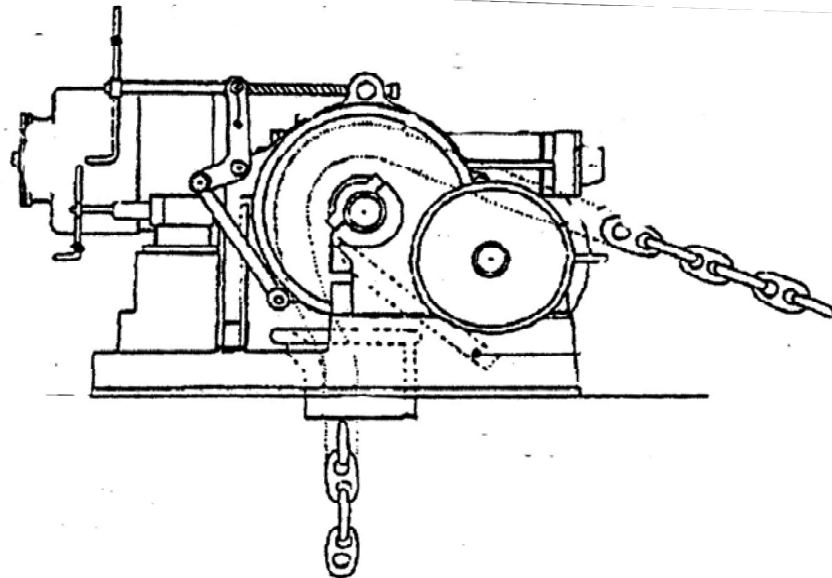
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Where would you find the specifications for testing and certification of cargo gear?

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**Question 14.**

Complete the table below listing four different methods of slipping.

Method of slipping	Description and/or sketch

**Question 15.**

List in order the precautions you would take to prepare your vessel to be slipped and secured after slipping when using a patent slipway.

Step	Action
1	
2	
3	
4	
5	
6	
7	

**Question 16.**

Using the galvanic scale shown below, explain your choice of either aluminium bronze, phosphor bronze or monel for use as a bearing with a stainless steel propeller shaft.

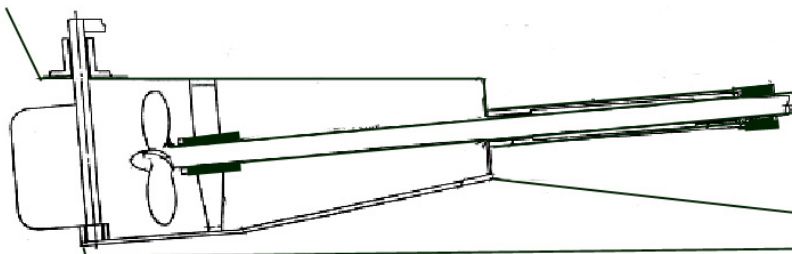
ANODIC END

- 1 MAGNESIUM
- 2 ZINC
- 3 ALUMINUM ALLOYS
- 4 CADMIUM
- 5 MILD STEEL
- 6 CAST IRON
- 7 NICKLE CAST IRON
- 8 ALUMINIUM BRONZE
- 9 BRASSES
- 10 TIN
- 11 COPPER
- 12 LEAD-TIN SOLDERS
- 13 ALUMINIUM BRASS
- 14 MANGANESE BRONZE
- 15 SILICON BRONZE
- 16 GUNMETAL
- 17 NICKEL SILVER
- 18 NICKEL -CHROMIUM ALLOYS
- 19 LEAD
- 20 COPPER NICKEL
- 21 PHOSPHOR BRONZES
- 22 NICKEL -SILVER
- 23 COPPER -NICKEL ALLOYS
- 24 STAINLESS STEELS
- 25 SILVER SOLDER
- 26 NICKEL
- 27 SILVER
- 28 MONEL
- 29 TITANIUM
- 30 GOLD
- 31 PLATINUM
- 32 GRAPHITE

CATHODIC END

**Question 17.**

Label six components of the stern arrangements shown below. Name and discuss the survey checks that you would carry out on the system.



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What is the minimum tailshaft wear permitted within survey?

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How would you test the proper alignment of the propeller shaft to the A bracket bearing?

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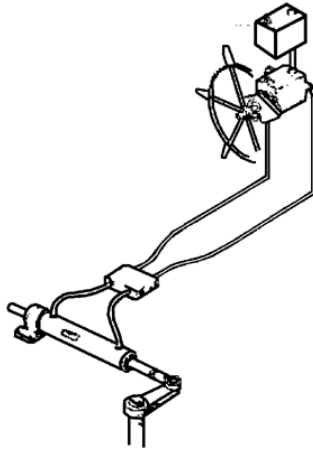
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**Question 18.**

Label six components of the hand hydraulic steering system shown below. Name and discuss the safety features and list the pre-departure checks that you would carry out on the system.



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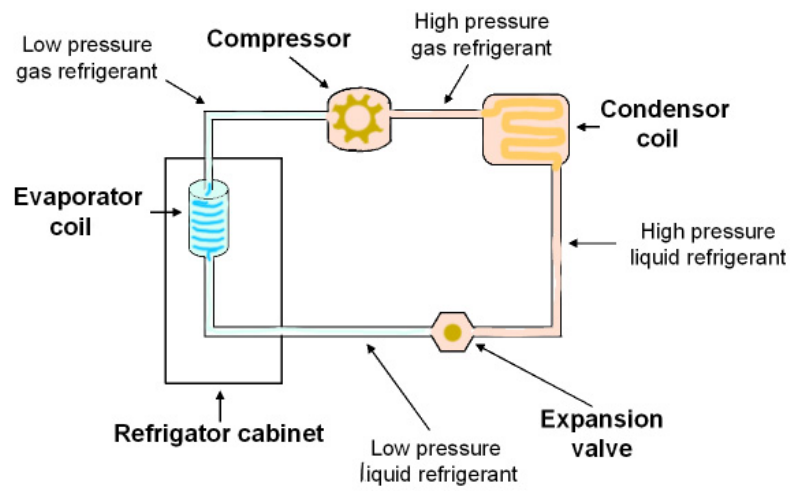
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**Question 19.**

Explain the functions of each component of the refrigeration system shown below.



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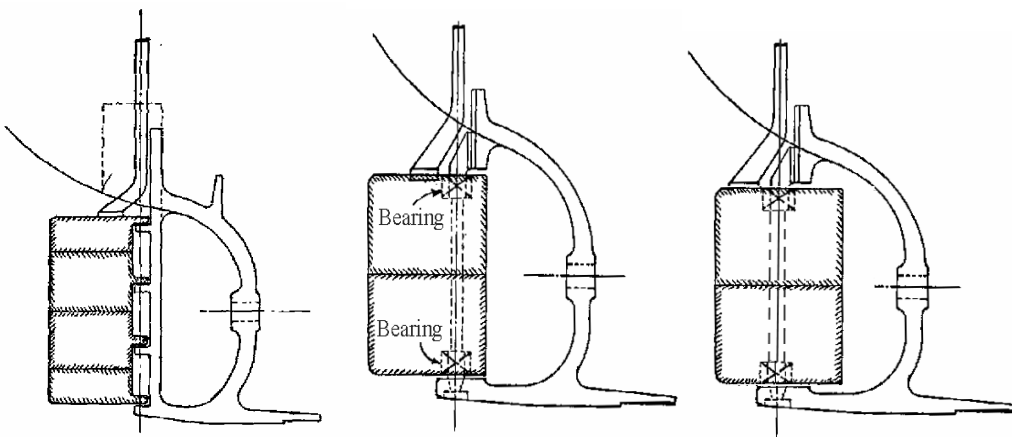
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**Question 20**

Name and describe the principles of each of the three rudder types shown:



**Question 21.**

A fuel tank measures 2.8m long, 1.3m wide and 1.2m high.

The engine develops 380 kw using 0.42 ltr/kw/hr. After the journey the fuel had dropped 520mm.

a. How much fuel, in litres, was used on trip?

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b. How far in nautical miles did the vessel travel doing nine (9) knots?

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**Question 22.**

A vessel has two motors which develop 420 kw each and use 0.28 ltr/kw/hr each. If the vessel used 1296 ltr. on a trip @ 6 knots,

- a. How far in nautical miles did it travel?

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- b. How long did the journey take?

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**Question 23.**

A Vessel has two full cylindrical fuel tanks which have a diameter of 860 mm and are 1.8 metres high. During a voyage the vessel used 720 litres of fuel.

- a. How far in mm. did the fuel level drop (in each tank) during the voyage ?

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- b. How much fuel, in total, remained on board after the voyage?

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If the vessel was fitted with one motor which developed 320kw and uses 0.27 ltr/kw/hr

- c. How far did the vessel travel doing seven (7) knots ?

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**Question 24.**

A vessel has one motor which develops 310 kw and uses 0.16 ltr/kw/hr. The vessels fuel tank is cylindrical and measures 1.1 m wide and 1.9m high. If the vessel undertook a journey of 280 nms @ eleven (11) knots,

- a. How many litres of fuel must be loaded (including a reserve of 20%).

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- b. What would be the sounding of the tank before departure?

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**Question 25.**

A Vessel has a full cylindrical fuel tank which has a diameter of 860mm and is 2.9 metres high. During a voyage the fuel level dropped 630mm.

- a. How much fuel, in litres, was used on trip?

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- b. How much fuel, in total, remained on board after the voyage?

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If the vessel was fitted with two motors which develop 410 kw and use 0.32 ltr/kw/hr each,

- c. How far did the vessel travel doing eight (8) knots?

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**Question 26.**

A vessel has two motors which develop 390 kw each and use 0.39 ltr/kw/hr each. The vessels fuel tank is rectangular and measures 1.6m wide, 1.9m high and 3.5m long. If the vessel undertook a journey of 310 nms @ eleven (11) knots,

- a. How much fuel, in litres, would be required on board if she departed with a reserve of 20%.

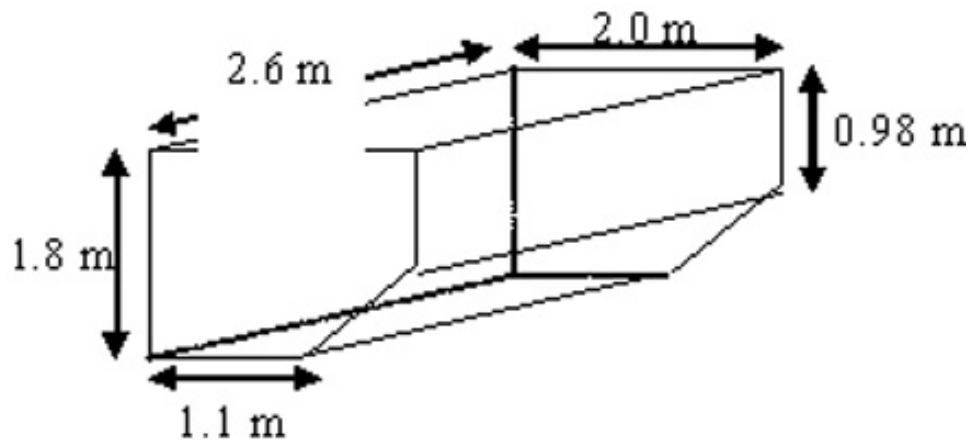
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- b. What would be the sounding of the tank before departure?

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**Question 27.**

What is the capacity in litres, of the thin walled tank below (no allowance for wall thickness is required).



[Show me the answers](#)