

轮机英语关联题

第四章 关联题 79 题

Passage 1

Valve drive mechanism

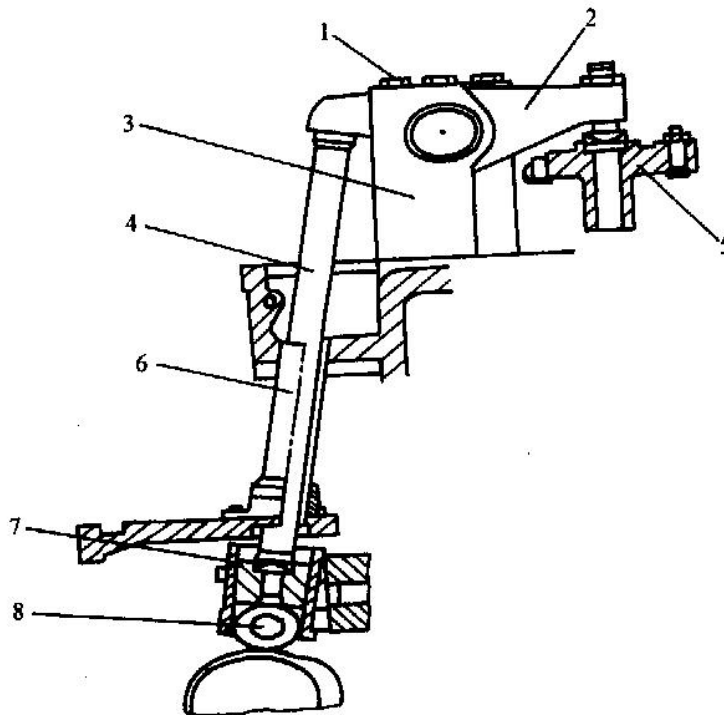
The valve drive mechanism commands the inlet and exhaust valves at the required timing.

The valve drive mechanism consists of an inlet and exhaust cam follower (8) each suspended in a plunger of the tappet assembly (7), two tubular push rods (4) with ball joints, two nodular cast iron rocker arms (2) suspended in a rocker arm bearing bracket, two yokes (5) and a yoke guide pins. See Fig. 4-1.

The tappet rollers follow the cam profiles and transfer the movements through push rods to the rocker arms. The rocker arms operate the inlet and exhaust valves through yokes (5). Lubrication for the rocker arms comes from the engine's secondary oil supply manifold through drillings in the cylinder head and rocker arm bracket.

The tappet assembly receives lubricating oil via channels in the engine block from the main supply manifold. For the roller and shaft, the oil is supplied through the guiding plunger.

To compensate for heat expansion a clearance must exist between the rocker arm and yoke. All adjustments have to be



done on a cold engine only.

Fig-4-1 Valve drive mechanism

1. According to the passage, the best time to adjust the valve clearance is _____.
A. before the engine is started
B. when the engine is running
C. after the engine has just been stopped
D. when something has gone wrong with the engine
2. The roller and the tappet assembly are lubricated by means of _____.
A. the main lube system
B. the secondary oil system
C. the special pumping system
D. the turbine oil system

3. According to the passage, the valve drive mechanism does not include _____ *
- A. tappet rollers B. push rods **C. nodular cast iron** D. yokes and guide pins
4. To close valves tightly, which clearance should be inspected according to the maintenance schedule?
- A. The one between the cam and the tappet roller.
B. The one between the push rods and the ball joints.
C. The one between the rocker arms and the yoke
D. The one between two tubular push rods.

AACC

Passage 2

Charge air cooler

The engine is equipped with a charge air cooler. The insert type charge air cooler is mounted in a welded casing (air trunk). The trunk is bolted to the engine block.

Standard is a two-stage cooler mounted. The first stage, through which the charge air flows, is cooled with water from the HT cooling system and cools the charge air till approx. 90 – 100°C. The second stage is supplied with water coming from the LT water system and cools the charge air further till the required temperature of approx. 50 °C. By controlling the water flow through the LT cooler the charge air temperature can be kept constant at the required temperature.

The circulating coolant water should always be under positive pressure and should be as clean as possible. The operating air temperature should be maintained by controlling the coolant inlet temperature.

Whilst the engine is running the air and coolant temperatures and pressures at inlet and outlet should be checked and logged periodically. **Variations** from normal indicate faults developing such as fouling of the film plates or **obstruction** of the water tubes.

Check daily, during operation of the engine, the working of the telltale hole at the free end of the charge air receiver. The function of this hole is to inform the operator the presence of water in the charge air receiver. Under normal condition only compressed air should escape from this hole.

1. According to the passage, the expression " HT" probably means _____.
- A. HIGH TANK **B. HIGH TEMPERATURE**
C. HEAT TRANSMISSION D. HEAT TRANSFER
2. In order to maintain the charge air temperature we should control _____.
- A. the coolant inlet temperature coming from the first stage cooler
B. the coolant flow coming from the second stage cooler
C. the coolant outlet temperature coming from the second stage cooler
D. the coolant flow coming from the first stage cooler
3. The charge air temperature **departing from** normal may indicate that _____
- A. condensate can be formed
B. only compressed air should escape from the telltale
C. the film plates are becoming dirty or the water tubes are blocked by scale
D. cooling water may have been carried into the cylinders
4. The function of the telltale hole is to _____.
- A. detect whether compressed air has escaped from the hole
B. control the coolant inlet temperature
C. determine whether the coolant water is under positive pressure

D. inform the operator the presence of water in the charge air receiver

BBCD

Passage 3

Starting air system

The engine is started with compressed air of max 30 bar. Minimum pressure required is 15 bar. A pressure transmitter PT301 mounted on the starting air line before the main starting valve has an indicator in the instrument panel. The supply line from **the starting air bottles** is provided with a non return valve and a drain valve.

The solenoid valve is electrical (remote control) or manual (on the engine) operated and send after activation a pilot air signal to the main starting air valve. Interruption of the control air doses the main starting air valve.

After the main starting air valve is activated the air flows through the flame arrestere to the starting air valves in the cylinder heads. Part of the air flows via the starting air distributor to each of **the starting air valves in the cylinder heads**. The starting air distributor controls the timing of opening and closing of the starting air valves. On the moment **the main starting air valve** is operated also **the governor booster** is energized. The main starting air line is provided of a safety valve. Interlock valve is a safety device to avoid an engine start with **engaged turning gear**.

1. As the engine is started with compressed air, the correct sequence of the following devices being activated is _____.

① solenoid valve; ② **starting air valve**; ③ starting air distributor; ④ main starting air valve ;
⑤ governor booster.

A. ①,⑤,④,②,③ **B. ①,④,⑤,③,②** C. ①,④,③,②,⑤ D. ④,③,①,②,⑤

2. The sentence " the governor booster is energized" (paragraphs) probably means _____.

A. the governor booster is supplied with electric power

B. hydraulic oil is pumped into the governor booster

C. the governor starts to work before starting the engine

D. the governor booster is supplied with pressurized air before starting the engine

3. Which of the following components are attached to the air bottles?

A. a pressure transmitter FT 301

B. a non-return valve and a drain valve

C. a solenoid valve

D. a starting air distributor

4. When the engine is engaged with turning gear, _____ can keep the engine from starting

A. the control air

B. the solenoid valve

C. the main starting air valve

D. the interlock valve

BDBD

Passage 4

Starting air distributor

The starting air distributor is of the piston type with precision machined **inter changeable** liners.

The liners as well as the pilot pistons are of corrosion resistant materials. The pilot pistons are controlled by a cam connected to the camshaft end. When the main starting valve opens, the pilot pistons are pressed onto the cam, whereby the pilot piston for the engine cylinder which is in starting position admits control air to the main piston of the starting valve. The starting air valve opens and admits compressed air into the engine cylinder forcing that piston down. Shortly before the exhaust valves are opened the pilot valve interrupts the control air to the starting air valve and starting air to that cylinder is stopped. This procedure will be repeated as long as the main starting valve is activated or until the engine speed is so high that the engine fires. After the main starting air valve is closed, the main starting air system is de-aerated, the pressure drops

quickly and the springs will lift the pilot plungers off the cam. This means that the pilot plungers touch the cam only during the starting process and thus wear is insignificant.

If a pilot liner is worn out, press it out. It may be necessary to heat the distributor up till about 200 °C as "Loctite" is used for fixing and sealing.

1. According to the passage, the liners of the starting air distributor _____.
A. can be replaced when worn out B. are made of heat resistant materials
C. are welded precisely D. are worn out easily during the starting process
2. During the starting process, when _____, the main starting air valve is closed.
A. the exhaust valves in the starting cylinder are opened
B. the pilot air to the starting air valve is stopped
C. the engine speed reaches fire speed
D. the pilot pistons are pressed onto the cam
3. When some cylinder of the engine admits compressed air into it, the pilot piston of the starting air distributor should be _____.
A. separated from the cam B. pressed onto the cam
C. lifted off the cam D. pressed onto the cam repeatedly
4. From the passage we know that "Loctite" is probably _____.
A. a type of gasket B. a kind of lubricant
C. a glue bond D. an anti-corrosion additive

ACBC

Passage 5

The engine's supporting element consists of a bedplate and frame. The bedplate can be of welded or cast design. The frame is made of cast iron. The turbocharger mounting, the housing for the air cooler and the charging air receiver are cast as an integral part of the frame. The underslung crankshaft's main bearings are mounted in bores in the frame and secured with main bearing caps of steel. The caps are guided sideways and are secured by means of threaded studs and nuts that are tightened hydraulically.

The caps are also secured with horizontal bracing screws in the frame.

The bearing shells are produced with a tolerance that makes it possible to change them a set at a time without any scraping-in.

The top flanges of the cylinder liners are forced against the top face of the frame by the cylinder covers, whereas at the bottom they are guided by a bottom flange through which they are free to expand under the effects of heat. Tightness between the water chamber and the crankcase is achieved with two rubber rings inserted in slots in the guide surface of the cylinder liner.

The camshaft is driven from the crankshaft through a gearing, which is mounted on the engine's flywheel end and covered by a 2-part shield. The camshaft runs in steel bushes lined with white metal.

In each side of the frame, large openings are provided for inspection of roller guides, cams and the main and crank bearings. The openings have covers, some of which are provided with crankcase explosion relief valves that equalize the pressure if the oil vapors in the crankcase are ignited, for example as a result of hot running.

The bedplate can be used as a lubricating oil reservoir and is therefore provided with a dipstick. The oil can, however, be drained off to a special bottom tank, so that the engine runs with a dry sump.

A fuel oil pump of the gear type is driven from the camshaft through a clutch. A lubricating oil pump, which is of the same type, is driven by a clutch mounted on the end of the crankshaft or, for propulsion plant, through a flexible gear wheel drive.

(The following questions are based on the passage above)

1. This passage is mainly about _____.
A. the construction of an engine
B. how the engine works
C. the lube and cooling system of an engine
D. when the crankcase explosion occurs
2. Which of the following is NOT mentioned as an integral part of the frame?
A. Turbocharger mounting
B. Bearing caps
C. Air cooler housing
D. Scavenging air reservoir
3. The camshaft _____.
A. is supported by bearings
B. may not drive the fuel oil pump in some cases
C. will not drive a lube oil pump
D. All of the above are true.
4. Which of the following is NOT true?
A. The frame is made of cast iron.
B. There are underslung bearings in this engine.
C. Four rubber rings ensure the tightness between the crankcase and the water chamber.
D. Relief valves are provided on the frame.

ABDC

Passage 6

The cylinder cover is made of cast iron and is provided with two inlet valves, two exhaust valves, a central mounted fuel injection valve and an indicator valve. The inlet valves are mounted with separate seating rings **made of** special heat-resistant cast iron. These rings are pressed into the cylinder cover in cooled conditions. The exhaust valve seatings are special, water-cooled seating rings. These rings are also pressed into the cylinder cover in cooled conditions.

Each cylinder cover is provided with cooling water from a screwed-on tubular cooling water jacket through radial bores in the thick bottom of the cover. Each of the radial bores is connected to two side bores. The cover has further separate bores that lead to the cooling water jacket and the bores in the cylinder cover to a common outlet chamber. The cylinder cover and cylinder liner are assembled by means of four threaded studs screwed into the frame. Tightening is effected by means of hydraulic tools, and sealing by means of a **thin ring** mounted between the cylinder cover and the cylinder liner. A starting valve is mounted on the side of the cylinder cover.

The engine has oil-cooled pistons of cast iron. The pistons are provided with three compression rings and a spring-loaded scraper ring. A space for cooling oil is provided at the top of the piston. The scraper ring prevents lubricating oil from being drawn up into the combustion chamber.

Oil for cooling the piston crown is led from a bore in the crankshaft through a channel in the connecting rod and the connecting rod journal, to die bushing for the gudgeon pin. This bushing is provided with an annular groove from which part of the oil is led for lubricating the gudgeon pin. The remaining oil continues through bores in the gudgeon pin and the piston to piston cooling chamber.

(The following questions are based on the passage above)

1. This passage is mainly about _____.
A. cylinders and cylinder covers
B. cylinders and pistons
C. cylinder covers and pistons
D. cylinders and oil
2. Which of the following may be provided on top of the cylinder cover?
A. Two exhaust valves
B. A starting valve
C. An indicator
D. All of the above
3. Which of the following is true?
A. The inlet valve seating rings are of heat-resistant cast steel.
B. There are six studs by which the cylinder cover and liner are tightened.
C. The exhaust valve seatings are cooled by water.
D. A copper ring is mounted between the cylinder cover and the liner.

4. Which of the following is NOT true?

A. The pistons are cooled by oil.

B. Four piston rings are fitted to each piston.

C. The scraper ring scrapes the oil downwards.

D. The piston cooling is of splash type -

CACD

Passage 7

Each of the engine cylinders is provided with a Bosch, type PF, fuel pump. The fuel pump is a single-acting plunger pump with non-adjustable stroke. The plunger is so accurately ground and lapped that its clearance inside the barrel is only 0.002 ~ 0.003 mm. This provides sufficient tightness between plunger and barrel, even at pressures as high as 200 - 400 bar, without the need for sealing materials. Neither the plunger nor the barrel can therefore be renewed individually. The plunger pressure stroke is produced by a cam on the engine camshaft, whereas the return stroke, the suction stroke is effected by means of a strong coil spring. The top of the pump barrel is closed by a spring-loaded pressure valve, to which the fuel oil pipe for the respective fuel valve on the relevant engine cylinder is connected.

Regulation of the amount of fuel delivered by the fuel pump is achieved by turning the pump plunger, the cylindrical surface of which has a milled recess. The bottom of this recess ends with an edge, which is at right angles to the cylinder generating lines, whereas the top of the recess is limited by a helix. This produces an inclined control edge on the plunger, which also has a narrow longitudinal groove. In the pump barrel are drilled two diametrical holes through which the fuel oil can flow into the fuel pump barrel. The pump barrel is surrounded by a regulating sleeve, the upper end of which is shaped as a toothed rim. The lower end has two lengthwise slots in which projecting lugs on the lower end of the plunger can slide up and down. The end of the regulating rod from the engine governor is designed as a toothed rack that engages with the toothed rim on the end of the regulating sleeve. This makes it possible to turn the pump plunger during engine operation.

(The following questions are based on the passage above)

1. The fuel pump _____.

A. is of PF type

B. is of reciprocating type

C. has an inlet valve and an outlet valve

D. A and B are true.

2. The plunger _____.

A. is accurately ground and lapped outside the barrel

B. has a tiny clearance inside the barrel

C. can be renewed individually when worn out

D. All of the above are true

3. Which of the following is true?

A. The stroke of the plunger can be adjusted

B. The outlet valve is spring loaded

C. The plunger down stroke is accomplished by the spring

D. B and C are true.

4. It can be inferred that when moving the rack _____.

A. the sleeve moves up and down

B. the plunger moves up and down

C. the effective stroke of the pump will be changed

D. All of the above are true.

DBDC

Passage 8

Governing prime movers, particularly diesel engines, require careful consideration. The cyclic variations of a diesel cycle can be passed into the governor drive if it is too "stiff". That is, the cyclic vibrations will be imposed on the internal gearing etc. inside the governor housing. To prevent this, some form of damper should be used on the drive into the governor. The mounting point for the governor should be rigid; a vibration mounting would soon downgrade even the best of governors. Chain or belt drives should be avoided as far as possible, as slapping of the belt or chain produces speed variations causing malfunction of the governor. Similarly the drive from the end of the camshaft is subject to torsional

vibrations, and governors should not be located at that point. They should be located as close as practicable to the fuel pumps, thereby limiting the mass/inertia of operating linkage. In all cases, the governor should be matched to the engine requirements in terms of droop, load limiting, response time etc. On large engines there is an inertial resistance to acceleration within the masses of reciprocating and rotating elements of the engine, so that during acceleration fuel could be released to the cylinders at a faster rate than efficient combustion can burn it. In an attempt to compensate for this, and to maintain acceptable combustion during acceleration, a tapping from the scavenge space may be taken and the pressure used to regulate the rate of fuel released to the engine. This process is incorporated into the governor operating system so that the governor releases a quantity of fuel commensurate with the increase in air pressure in the scavenge space. (during deceleration the problem is not so great, as excess air can be tolerated far more easily than can the incomplete combustion associated with insufficient air.)

(The following questions are based on the passage above)

1. This passage is mainly about _____.
A. mounting the governors
B. the scavenge pressure limit to the governor
C. A and B
D. how the governor regulates the fuel index
2. The drive to the governor _____.
A. should be rigid
B. should use damper
C. should use chains or belts
D. should be from the end of the cam shaft
3. The governor should be mounted close to the fuel pumps _____.
A. for limiting the inertia effect
B. for limiting the load
C. to ensure speed droop
D. to cut down the cost
4. It can be inferred that with scavenge pressure limit _____.
A. the engine can be accelerated rapidly
B. the engine can be decelerated rapidly
C. the governor will supply fuel oil efficiently
D. the combustion will be more complete

CBAD

Passage 9

After the shut-off valve of the starting air receiver has been opened, the air flows at full pressure through the filter to the main start valve "A" (with complicated construction), thereby applying pressure to pipe between the main start valve "A" and the starting air control valve. Providing that maneuvering hand wheel is in the "Stop" position, all other pipes are without pressure.

If the wheel is turned towards the "Start" position, a pawl above the starting air control valve is actuated and the valve is opened, allowing air to flow to the main start valve "A". It opens to allow a direct through-flow of air. **All cylinder starting valves are thus exposed to air pressure** and, furthermore, air flows to the starting air distributor, which is controlled by the camshaft. The distributor has a series of slide valves arranged radially around the camshaft-one slide valve for each cylinder. These supply pilot air to the cylinder starting valves with pistons in the "Start" position. The rotation of the engine crankshaft commences, after which the cylinder starting valves are opened in the correct sequence - The crankshaft is thus brought to speed of rotation necessary for compression and ignition.

When the maneuvering hand wheel is turned, the governor is actuated through a flexible cable setting the fuel pumps. However, a fuel index limiting arrangement is inserted, which keeps the regulating shaft and thus the fuel pumps at zero index during the starting process, ensuring that fuel is not injected into a cylinder during the supply of starting air.

When the engine crankshaft has reached the necessary speed, the hand wheel is turned further past the "Start" position with the result that the arm above the starting air control valve is released and the valve is closed and vented. At the same time, the control piston in the main start valve "A" is also vented, thus blocking the supply of air to the cylinder starting valves, the starting air distributor and the fuel index limiter. Gradually, as the handle is turned further towards the maximum

position. The governor increases the fuel pump index and the crankshaft rotates more quickly. The governor ensures that the maximum permissible speed is not exceeded.

(The following questions are based on the passage above)

1. This passage is about _____.
A. starting air system and speed regulating system
B. start of the engine
C. governor
D. crankshaft
2. If the shut-off valve of the starting air receiver is opened _____.
A. the cylinder starting valves are subject to pressure
B. the air flows to the starting air distributor
C. the starting air control valve is actuated
D. None of the above is true.
3. If the hand wheel is positioned "start" _____.
A. the starting air control valve will be opened
B. individual starting valve on each cylinder will be exposed to pressure
C. there will be cylinder starting valve or valves opened
D. All of the above are true.
4. During the supply of starting air to the cylinder _____.
A. air is consumed
B. fuel oil may be supplied to the cylinder or cylinderd for reliable starting
C. the control piston in the main start valve "A" is vented
D. All of the above are true.

BDDA

Passage 10

The governor drive is placed on the stem end of the engine and consists of a cylindrical gear wheel which is driven by the gear wheel on the camshaft, plus a set of conical gears. The function of the governor is to control the effective stroke of the fuel pumps, so that the rev/min of the crankshaft is maintained constant within certain limits, independent of the load.

The action of the governor is transferred through arms and draw rods to a longitudinal regulating shaft on which a 2-part arm is provided for each fuel pump. The 2-part arm comprises an aim holder and a spring lever which are connected by a spring, thereby enabling the governor to control the pumps even if one of the pump pistons seizes. The movement is transferred from the spring lever to the toothed rack of the pump through a linkage.

The regulating shaft is also provided with a stop arm which can be moved by the piston rod in a stop cylinder that is activated when the engine's overspeed trip comes into operation. The piston rod in the stop cylinder influences the stop arm, whereby the regulating shaft is turned and the fuel pumps are set in the "Stop" position, thus stopping the engine. The Woodward governor tries to maintain the regulating shaft in the "Running" position, but between the governor and the regulating shaft there is a flexible draw rod that can be compressed and thus allows the regulating shaft to be moved into the "Stop" position.

If a cylinder is to be set out of action, e.g. when measuring the compression pressure, the spring lever and thereby the toothed rack of the relevant fuel pump is moved to the zero position.

(The following questions are based on the passage above)

1. This passage is mainly about _____.
A. working of the governor
B. the camshaft
C. fuel index regulating of the engine
D. the fuel pump
2. The governor _____.

- A. is driven directly by the crankshaft B. is driven with chains by the camshaft
C. is in the middle part D. None of the above is true.
3. If a fuel pump piston seizes _____
A. the stop cylinder will be activated B. the governor will be damaged
C. the relevant spring will be compressed D. the flexible joint will be compressed
4. When measuring die compression pressure in the cylinder _____.
A. the engine should be stopped
B. the fuel pump should be stopped
C. the toothed rack of the relevant fuel pump should be moved to zero position
D. None of the above is true.

CDCC

Passage 11

Where routine maintenance is concerned, the governor should be checked regularly for adequate lubrication. The operating range is usually quite small, giving a tendency for them to wear over limited areas. Then a sudden and larger change in speed than normal may carry the governor onto a ridge of debris or gummy oil deposit so that it may stick at that point. To restrict this problem as far as possible, the governor pivots, slide, etc. should be cleaned and well lubricated whenever possible. It should be born in mind that the governor structure is such that, were the spring to fracture in any way, the flyweights would be able to move outwards and shut the engine down. The connections from the governor to the fuel racks should be designed in such a way that the governor can both increase and decrease the fuel within the bounds of some hand setting; i.e. the governor can adjust the fuel settings but cannot release more fuel to the engine than is dictated by some predetermined value set by the engine operator.

To overcome the above limitations of the CF governor, "servo governors" have been developed. These use the power of hydraulics to pump the heavier fuel rack systems associated with larger engines in to the desired position. This "powered" operation is rapidly and accurately achieved, and the hydraulic flow can be either electrically or mechanically controlled. The speed sensing can be done by a tachometer arrangement that can be set to the desired speed, and on sensing any variation a solenoid operated flow valve allows pressurized hydraulic flow into a servo system of pistons/plungers which resets the rack positions. Although this system is quite effective, more mechanically controlled governors are fitted to larger engines. These use the principle of the CF governor, i.e. fly weights acting against spring pressure, but instead of the slide working directly onto the fuel racks it simply regulates the flow of hydraulic fluid to servo pistons controlling the rack positions. this system therefore has the proven reliability and sensitivity of the small CF governor and yet develops quite a large governor effort through the hydraulic fluid.

(The following questions are based on the passage above)

1. Which of the following is the reason that the governor discussed sticks?
A. The governor is not sensitive normally. B. It is because of wear in normal working range.
C. The change of speed is too small D. All of the above are true.
2. If the spring fractured _____.
A. the fly weights would fracture too B. the speed would be greatly increased
C. the operator would set the value D. the fuel would be cut off
3. From the first paragraph we know that the fuel index _____.
A. will exceed the predetermined upper limit on account
B. will exceed the predetermined limit if the load is too high
C. will invariably stuck
D. None of the above is true.

4. The second paragraph is mainly about_____.

A. hydraulic power

B. CF governors

C. advanced governors in stead of CF governor

D. electrical or mechanical hydraulic flow

BDAC

Passage 12

A typical example of a **hydraulic governor** is the Woodward. **This has adjustable droop for parallel operation** and it is fitted with a speed-adjusting control. If required it can be fitted with a synchronizing motor to provide **remote control** from a switchboard.

A gear pump driven from the engine supplies oil under pressure to accumulator pistons under which is a by-pass to regulate maximum pressure. One branch supplies oil which acts on top of the power piston, the pressure always tending to turn the terminal shaft to shut off fuel, while the other branch supplies oil to the pilot valve which is operated by the linkage from the fly weights above.

Should the speed of the engine decrease due to increased load the flyweights will move towards their center of rotation and lower the position of the pilot valve plunger, admitting oil pressure from the bottom of the power piston. Since, however, the area on the bottom is much greater than the top the net resultant force causes the piston to move upwards. This operates the power lever turning the terminal shaft which varies the cut-off point in the fuel pump through linkage, but as the power piston moves up, the actuating compensating piston moves down. Oil under this piston is now forced through the needle valve to the receiving compensating piston, raising the outer end of the floating lever and the pilot valve plunger until it has returned to its normal position. This stops further movement of the terminal shaft so that the fuel control is now set in a position corresponding to the increased fuel required to run the engine at normal speed under the increased load.

(The following questions are based on the passage above)

1. This passage is mainly about_____.

A. what type of governor should be provided when the engine is used for electric power generation

B. why the speed of the engine fluctuates

C. how the governor works

D. how the fuel pumps work

2. Which of the following is true about the Woodward discussed?

A. It is a kind of mechanical governor.

B. It can not be used for parallel operation.

C. It has speed droop.

D. It may only be manually controlled from a switch board.

3. The oil from the gear pump will _____.

A. be supplied to the accumulator

B. act on the power piston

C. be supplied to the pilot valve

D. All of the above are true.

4. When the speed of the engine decreases due to increased load, which of the following will NOT happen?

A. The flyweights move towards their center

B. The pilot valve plunger moves towards its normal position.

C. The power piston moves downwards until it returns to its normal position.

D. The terminal shaft moves to a new position

CCDC

Passage 13

The cylinder liner is of alloy cast iron, its upper flange lands on top of the frame and has bore cooling. It is secured by a forged steel cylinder cover which is also bore cooled and is shaped internally to accommodate most of the combustion

space. Cylinder lubricating oil is injected at one level in the liner. Pistons have a chrome-molybdenum alloy steel crown with hard chrome-surfaced ring grooves in which four compression rings are fitted. **In this particular model** a protective layer of Inconel is welded to **part of** the crown surface **to prevent high temperature corrosion**. The piston is oil cooled, oil being supplied by & telescopic gland to the crosshead and then through the piston rod. It is returned from the crosshead to a slotted pipe in the crankcase. A short cast iron skirt is added. The crown is bolted to the piston rod at an inner support ring.

Surface hardening reduces wear on the piston rod at the diaphragm gland. The rod is bolted at the top of a cylindrical crosshead which is of large diameter and incorporates a full-length bottom half-bearing shell. **Floating** guide shoes are attached at each end.

The crankshaft may be either semi-built up or of welded construction, with large journals and pins. All crankcase bearings are of white metal. Main bearings have thick shells, crankpin (bottom end) and crosshead (top end) bearing have thin-wall shells. White metal is used for the guide surfaces. The exhaust valves are operated hydraulically under oil pressure from cam-timed actuated pistons. They have air compressed springs which allows them to be **rotated** by vanes. The valve spindles are usually manufactured by the hot isostatic pressure (HIP) method, a compound Nimonic and austenitic steel part construction. Valve housing is cooled at its seat and spindle guide bush but its upper duct is uncooled to avoid low temperature corrosion.

1. which of the following features is not mentioned about the cylinder cover?
A. Made of forged steel
B. Special shaped
C. Bore cooled
D. **Intensively cooled**
2. In order to prevent high temperature corrosion on the piston crown, what kind of special measures is taken?
A. Made of chrome-molybdenum alloy steel
B. Hard chrome-surfaced
C. **Inconel welded**
D. Surface hardened
3. Which one is not bolt-connected?
A. The piston crown and the piston skirt
B. The piston crown and the piston rod
C. The piston crown and the cross head
D. **The guide shoes and the guide**
4. The exhaust valves are rotated by _____.
A. cam
B. **compressed air**
C. vanes
D. hydraulic oil

DCDB

Passage 14

In a closed fresh water system, the engine jackets, the heat exchanger and the circulating pumps form a continuous circuit which is not open to the atmosphere. The cylinder jacket cooling water after leaving the engine passes to a sea water circulating cooler-heat exchanger-and then into the jacket water circulating pumps. It is then pumped around the cylinder jackets, cylinder heads, exhaust valves and turbo-blowers. However, provision has to be made for the expansion of the water due to the increase in temperature and due to small amounts of air which may enter the system and become entrained and for water make-up due to leakages. These are met by a small head tank which is open to the atmosphere and placed at a higher level than any other point in the system so that the small changes in volume can be accommodated by changing the level of the free surface of the water in the tank.

The head tank is generally connected into the system at the pump suction, as this minimizes the chance of air being draw into the system at the pump. The minimum height of the head tank may be based on maintaining pressure of fresh water in the heat exchanger above that of the seawater to ensure that in the event of a small internal leak developing seawater cannot enter the fresh water system. Alternatively, it may be based on the need for a minimum pressure to be maintained within the jackets to avoid cavitation effects.

The closed systems usually need vents if steam pockets or air locks are not to cause trouble. Vent pipes of small-bore

tube are lead from any local high point in the system to the top of the head tank for the release of air from the cooling water. A heater in the circuit facilitates warming of the engine prior to starting by circulating hot water.

The temperature of the water **entering the engine jackets** is regulated by means of a by-pass across the jacket water cooler. The proportions of water passing through the cooler, or bypassing it are controlled by a three-way valve. The temperature is usually adjusted to **maintain a constant outlet water temperature from the engine** regardless of the load or speed or the temperature of the seawater.

The piston cooling system may be an open system which employs similar components with the closed system, except that a drain tank is used in stead of a head tank and the vents are then led to a hopper or tundish at the high point in the machinery space. The hopper serves as a visual flow indicator. A separate piston cooling system is used to limit any contamination from piston cooling glands to the piston cooling system only.

1. The loop of the jacket cooling water is _____.

- A. engine →heat exchanger →circulating pumps →engine
B. heat exchanger →engine →circulating pumps →heat exchanger
C. circulating pumps →heat exchanger →engine →circulating pumps
D. circulating pumps →engine →heat exchanger →circulating pumps

2. A small head tank is provided in the closed jacket cooling water system for _____.

- A. water expansion B. water make-up C. warming of the engine **D. A + B**

3. The head tank is connected to the closed circuit at _____.

- A. engine inlet **B. pumps inlet** C. heat exchanger inlet D. engine outlet

4. The jacket water temperature is regulated to maintain a constant temperature of _____.

- A. engine inlet B. pumps inlet C. heat exchanger inlet **D. engine outlet**

ADBD

Passage 15

During normal operation on heavy oil at sea, the oil is taken from the HO tanks, where it is stored. First, it is fed through a heater and next through a centrifuge for purification. It may then pass through a cooler, before being discharged to the steam-heated heavy oil service tanks. Two of these are usually fitted and they are used alternately. One tank is in use, while the other is being filled. These tanks are heated to a moderate temperature and self-closing drain valves are fitted to remove any water or sludge which may settle out. The oil is drawn from the service tank in use by pumps and discharged at low pressure to the fuel oil heater. These pumps should be in duplicate. A relief valve on the pumps will return excess pressure to the system. A viscosity regulator is fitted at the heater discharge, through which the oil will pass. This automatically controls the temperature of the oil fuel leaving the heater to maintain its viscosity within close limits. A by-pass must be fitted to the viscosity regulator. The oil is then discharged through a fine strainer to the main engine fuel pump suction. A pressure control valve is fitted in the system and excess oil returned either to the heavy oil service tanks or to a balancing tank.

A diesel fuel tank is included in the system with its discharge to the primary pump suction through a change-over valve. By operating this valve the engine may be operated on diesel oil. Change-over should be very gradual to allow temperatures in the system to stabilize. During this period, the excess oil will return either to the heavy oil service tanks or a balancing tank. After it has been pumped from the DO tanks, where it is stored, the diesel oil passes through a centrifuge for purification before entering the diesel oil tank.

1. The word "these" probably means _____.

- A. Ho lands B. a heater and a centrifuge
C. a heater and cooler **D. heavy oil service tanks**

2. How is change over from heavy oil to diesel oil carried out?

- A. Step by step B. Hand over hand C. Step for step D. Quickly
3. Where are self-closing drain valves fitted?
A. HO tanks **B. Heavy oil service tanks** C. Balancing tank D. Centrifuge
4. Which of the following statements is true according to this passage?
A. Two heavy oil service tanks are used meanwhile.
B. "Heater" mentioned in this passage is only used to heat heavy oil.
C. Two pumps are fitted, which draw oil from the service tank in use.
D. Diesel oil passes to the primary pump, and then through a change-over valve.

DABC

Passage 16

The diesel engine is a form of internal combustion engine similar to that used in a bus. Its power is expressed as brake horsepower (bhp). This is the power put out by the engine. Effective horsepower is the power developed by the piston in the cylinder, but some of this is lost by friction within the engine. The power output of a modern marine diesel engine is about 40,000 brake horsepower. This is now expressed in kilowatts. By comparison the engine of a small family car has an output of about 80 bhp. Large diesel engines, which have cylinders nearly 3 ft in diameter, turn at the relatively slow speed of about 108 rpm. These are known as slow-speed diesel engines. They can be connected directly to the propeller without gearing. Although higher power could be produced by higher revolutions, this would reduce the efficiency of the propeller, because a propeller is more efficient the larger it is and the slower it turns. These large slow running engines are used in the larger merchant ships, particularly in tankers and bulk carriers. The main reason is their low fuel consumption. More and more of the larger merchant vessels are being powered by medium-speed diesel engines. These operate between 150 and 450 rpm, therefore they are connected to the propeller by gearing. This type of engine was once restricted to smaller cargo ships, but now they are used in fast cargo liners as well as in tankers and bulk carriers. They are cheaper than slow-speed diesel engines, and their smaller size and weight can result in a smaller, cheaper ship.

1. Why do larger merchant vessels use slow-speed diesel engines?
A. Because they turn at about 108 rpm.
B. Because their propellers are more efficient.
C. Because they can be connected directly to the propeller without gearing.
D. Because they are fuel-saving.
2. According to the author's standpoint, what does the efficiency of slow-speed diesel engine propellers depend on?
A. Propeller power **B. Both propeller size and revolutions**
C. Propeller size D. Propeller revolutions
3. Why do medium-speed diesel engines have gearing?
A. In view of propeller efficiency B. In view of engine revolution
C. In view of fuel consumption D. In view of merchant ship size
4. What is probably the main reason why medium-speed diesel engines were once restricted to smaller cargo ships?
A. They are cheaper than slow-speed diesel engines.
B. The fuel consumption of the medium speed engine is more than that of the slow speed engine.
C. They operate between 150 and 450 rpm.
D. Smaller cargo ships require more efficient propellers.

DBAB

Passage 17

Instrument air must be clean and dry. Air leaving a compressor is 100% humid and has some free moisture present; the free moisture is easily removed by ceramic filters but an absorbent type drier is also required to give the desired dryness factor.

The source of the air can be from the main air reservoirs after reducing the air pressure to the 7 or 8 bar pressure required by the system. In this case it is likely that the dew point of the air will be such that an absorbent drier will not be needed and a ceramic filter will suffice.

1. The "instrument air " probably means _____,
A. an instrument consisting of air B. humid air C. dry air **D. control air**
2. A more effective method of removing moisture is _____ .
A. filtering **B. absorbing** C. heating D. cooling
3. The first sentence in the second paragraph tells us that the instrument air pressure is
A. 7 bar B. 8 bar C. 15 bar **D. 7 bar or 8 bar**
4. When will a ceramic filter suffice?
A. When there is an absorbent drier. B. When there is not an absorbent drier.
C. When dew point of the air becomes higher. D. When the dew point of the air becomes lower.

DBDC

Passage 18

Sufficient potable water may be taken on in port to meet crew and passenger requirements but the quality of this water will be too poor for use in water tube boilers and will require further treatment by distillation . It is common practice to take on only a minimal supply of potable water and make up the rest by distillation of sea water. Even in vessels which carry sufficient potable water for normal requirements it is a statutory requirement that such ships, when ocean-going, should carry distillation plant for emergency use.

The main object of distillation is to produce water essentially free of salts. Potable water should contain less than 500mg/litre of suspended solids. Good quality boiler feed will contain less than 2.5mg/litre.

1. The potable water means _____.
A. waste water B. that the quality is too poor to drink
C. the feed water for boilers **D. drinking water**
2. In common practice, when ocean-going every time, ships should take on _____,
A. sufficient potable water **B. minimal quantity potable water at least**
C. a distillation plant D. sufficient sea water
3. Suspended solids of the boiler feed will be _____.
A. less than 500mg/litre B. more than 500mg/litre
C. less than 2.5mg/litre D. more than 2.5mg/litre
4. Which of the following statements is not true?
A. Potable water used as feed should be treated to meet boilers.
B. The distillation plant can generate the fresh water.
C. The quality of potable water is better than distilled water.
D. A partial drink water can be made up by distillation of sea water.

DBCC

Passage 19

By bringing the water to its boiling point and drawing off the vapour the salts and other solids are left behind in the liquid, a proportion of **which** is discarded. The vapour produced is essentially solids-free although some solids are carried over, especially if the equipment is misused.

2. The underline sentence "the distilling unit may ..." means that _____.
- A. the vapour is cooled by salt water B. the salt water vapourizes in the distilling unit
C. the salt water is feed water D. the salt water is condensate
3. The phrase "sub-atmospheric pressure" in line 4 probably means _____.
- A. the primary air B. the secondary air C. vacuum pressure D. absolute pressure
4. Which of the following materials is not mentioned to make the evaporator-distiller shell?
- A. Cupro-nickel B. Non-corrodible material
C. Mild steel D. Aluminum brass

BACD

Passage 22

After ensuring that the "nip" is correct the bearing clearance should be checked. The bearing cup and its associated half shells are removed leaving the other half in position. Two pieces of pure lead wire are placed across the journal at positions one-third and two-thirds along its length. The cap and shell are replaced and tightened up until the "nip" is zero. The cap and shell are then removed and the thickness of the lead wire measured by a micrometer. It is important to use only pure lead, which is very soft, and to choose a thickness of wire, which is greater than the normal allowable clearances but not greater than twice this amount. The clearance should be within the manufacture's limits. As a guide these will be approximately 0.1 to 0.2 mm for white metal bearings and approximately 0.25 to 0.4 mm for copper-lead or tin-aluminum bearings with crankshaft journal diameters in the range from about 200 to 400mm

1. The lead wire should be put on the upper surface of the journal _____.
- A. longitudinally B. vertically C. transversely D. angularity
2. Which of the following statements is true?
- A. The cap and shell begin to be tightened when the "nip" is zero.
B. The cap and shell are to be tightened until the "nip" is zero.
C. The cap and shell are not to be tightened until the "nip" is zero.
D. The cap and shell haven't been tightened when the "nip" is zero.
3. According to passage, the thickness of the lead wire should be measured _____.
- A. before the cap and shell are removed
B. when the cap and shell are being removed
C. after the cap and shell have been removed second time
D. until the cap and shell are removed
4. According to the passage, the clearance for white metal bearing should be _____.
- A. less than 0.1 mm B. larger than 0.2 mm
C. within about 0.25 to 0.4 D. in the range from about 0.1 to 0.2 mm

CBCD

Passage 23

?

An automatic system usually consists of a control system and an information system. A control system is a system which measures the condition of some entity and, with the information, governs the state of a variable; i.e., speed, temperature, pressure, position, etc. The open-loop system is the simplest form a control system may assume. It is distinguished from the closed-loop system by the lack of an input which measures the state of the controlled variable; such an input is called a feedback. In modern ships the open-loop system has practically disappeared and the closed-loop system which operates with a feedback is extensively used.

An information system serves the parallel function of monitoring system or plant performance. The monitoring function may serve a number of purposes; specifically it may indicate values of controlled variables to guide remote control operations, warn of off-limit conditions and provide record of performance. In many cases a visual and audible alarm may

be provided to warn of off-limit conditions on board ship and, associated with this, the important variables will be recorded on demand.

The automatic control system can be more sophisticated by incorporating digital-processing equipment, that is, a computer. This computer is usually fed with signals from all sensors. It scans the values of the sensors and generates alarm signals for off-limit conditions, acting as a super-supervisor. Sometimes, it can even make necessary and take the necessary action to optimize performance without human intervention.

1. The closed-loop system differs from the open-loop system by _____.
A. the lack of a feedback
B. the presence of a feed back
C. the lack of a computer
D. the presence of a computer
2. A feedback is an input _____.
A. which governs the state of a variable
B. which provides a visual and audible alarm
C. which indicates values of controlled variables
D. which measures the state of the controlled variable
3. The monitoring function may serve all of the following purposes except _____.
A. instigating corrective action
B. indicating values of controlled variables
C. warning of off-limit conditions
D. providing record of performance
4. The word "off-limit" in the passage may mean _____.
A. off-set
B. off-state
C. within limits
D. beyond the limit

BDAD

Passage 24

A large fraction of the heat input to the main engine and auxiliary engines is wasted as a latent heat in the exhaust gases. Smaller but significant fractions are lost via cooling of the Jacket water, lube oil, and inlet air. For example, the fractions of heat input of a two-stroke main engine might be 35% to exhaust gases, 15% to jacket water, 5% to lube oil and 5% to all kinds of coolers.

The diesel engine exhaust gas temperature is at least 600 °C at full load, so it is feasible to extract part of its heat. With the installation of the turbochargers on main engines, much waste heat in the exhaust has been used to drive the turbochargers, which increase the inlet density, resulting in a great increase of engine output. The exhaust gases from the turbochargers are still at a high temperature, and it is possible to make further use of the high temperature gases to produce usable steam. For this purpose, exhaust gas boilers have been widely used and waste heat systems have been formed on board.

1. According to the passage, about _____ of the total heat input of a two-stroke main engine is discharged to the exhaust gases.
A. one quarter
B. one-third
C. half
D. two-thirds
2. According to the passages, the diesel engine exhaust gas temperature is at least _____ at full load.
A. 600 °C
B. 400 °C
C. 315 °C
D. 200 °C
3. With the installation of the turbocharger on main engine, a great increase of engine output results from _____.
A. decreased exhaust gas temperature
B. increased inlet air density
C. increased exhaust gas temperature
D. decreased inlet air density
4. In the next paragraph of the passage, which of the following statements may probably be described?
A. An auxiliary boiler
B. A fresh water generator
C. An waste heat boiler
D. A turbocharger

BCBC

Passage 25

Current regulations with respect to the discharge of oily water set limits of concentration 15 parts per million. A monitor is required to measure these values and provide both continuous records and an alarm where the permitted level is exceeded.

The principle used is that of ultra-violet fluorescence. This is the emission of light by a molecule that has absorbed light. During the short interval between absorption and emission, energy is lost and light of a longer wavelength is emitted. Oil fluoresces more readily than water and this provides the means for its detection.

A sample is drawn off from the overboard discharge and passes through a sample cell. An ultra-violet light is directed at the sample and the fluorescence is monitored by a photoelectric cell. Where an excessive level of contamination is detected an alarm is sounded and diverting valves are operated. The discharging liquid is then passed to a slop tank.

- The passage is mainly about _____.
A. oil pollution B. current regulations related to oil pollution
C. oil in water monitor D. the principle of ultra-violet fluorescence
- A monitor can obtain all of the following functions except _____,
A. measuring oil content values
B. providing continuous records
C. lowering the oil content below 15 p. p. m
D. providing an alarm unit warning of levels of discharge in excess of 15 p. p. m
- From the passage, we can learn that the ultra-violet fluorescence is a kind of _____.
A. oil sample **B. light** C. photoelectric cell D. alarm unit
- A sample is drawn off from _____ and passes through a sample cell.
A. bilge water B. discharge of oil separator
C. slop tank **D. discharge of oily water separator**

CCBD

Passage 26

The basic principle behind the operation of this very commonly used instrument is the fact that pure water has a very high electrical resistance and therefore a very low conductivity, to the extent that absolutely pure water can be considered as non-conductive. If sea water is added to pure water, the resistance to the passage of an electric current falls, i.e. the conductivity increases. This instrument measures the conductivity of water such as in boiler feed system by passing a sample through a small cell containing two platinum electrodes and measuring the current flow that occurs due to the conductance effect of any salts present. Readings are based on the assumption that the conductivity is due to sodium chloride (NaCl) or Cl as the case may be, but other salts such as magnesium chloride and calcium chloride will almost certainly be present. It is assumed for convenience that all conductivity is due to sodium chloride, and although this is not strictly accurate, it is sufficient so for practical purposes.

- This very commonly used instrument is most probably a _____.
A. flow-meter B. viscometer **C. salinometer** D. densimeter
- Reading measured by this instrument are based on the assumption that _____.
A. all conductivity is due to magnesium chloride
B. all conductivity is due to calcium chloride
C. all conductivity is due to magnesium chloride and calcium chloride
D. other salts such as magnesium chloride and calcium chloride are not present
- This installment indicates the readings by means of _____.
A. measuring the current flow B. measuring the salt content
C. measuring the electrical resistance D. measuring NaCl or Cl
- Which of the following statements is NOT true?

- A, Absolutely pure water can be considered as non-conductive.
- B. Magnesium chloride and calcium chloride will almost certainly be present in water such as in boiler feed system.
- C. In fact, all conductivity is due to sodium chloride in water.**
- D. The assumption that all conductivity is due to NaCl is sufficiently accurate for practical purposes.

CDAC

Passage 27

The field current supply in older machines comes from a lower voltage direct current generator or exciter on the same shaft as the alternator. Modern machines however are either statically excited or of the high-speed brush-less type. The exciter is required to operate to counter the effects of power factor for a given load. The power factor is a measure of the phase difference between voltage and current and is expressed as the cosine of the phase angle. With a purely resistance load the voltage and the current are in phase, giving a power factor of one. The power consumed is therefore the product of voltage and current. Inductive or capacitive loads, combined with resistance loads, produce lagging or leading power factors which have a value less than one. The power consumed is therefore the product of current, voltage and power factor. The alternating current generator supplying a load has a voltage drop resulting from the load. When the load has a lagging power factor this voltage drop is considerable. Therefore the exciter, in maintaining the alternator voltage, must vary with load current and also the power factor. The speed change of the prime mover must also be taken into account.

1. The word "machines" in the passage refers to _____.
A. the direct current generator
B. **the alternating current generator**
C. the exciter
D. the prime mover
2. Which of the following statements is true according to the passage?
A. With a purely resistance load, the power factor is zero.
B. Inductive loads combined with resistance loads produces leading power factors.
C. Capacitive loads combined with resistance loads produces lagging power factors.
D. **With a purely resistance load, the phase angle is zero.**
3. When the load has a lagging power factor this voltage drop is considerable. This sentence means that _____.
A. with a purely resistance load, the voltage drops too much
B. there is a considerable voltage drop in the capacitive load combined with resistance load
C. when the load is the capacitive load combined with resistance load, the voltage drops to zero
D. **when the load is the inductive load combined with resistance load, the voltage drop is fairly large**
4. The exciter must vary with : ① load current, ② the power factor, ③ speed change of the prime mover.
A. only ①
B. only ②
C. ① and ②
D. **①,② and ③**

BDDD

Passage 28

The windlass is the usual anchor-handling device where one machine may be used to handle both anchors . A more recent development, particular on larger vessels, is the split windlass where one machine is used for each anchor.

The rotating units of a split windlass consist of a cable lifter with shaped snug to grip the anchor cable , a mooring drum for paying out or letting go of mooring wires and a warp end for warping duties. Each of these units may be separately engaged or disengaged by means of a dog clutch, although the warp end is often driven in association with mooring drum. A spur gear assembly transmits the motor drive to the shaft where the various dog clutches enable the power take-off.

Separate band brakes are fitted to hold the cable lifter and the mooring drum when the power is switched off.

The cable lifter unit is mounted so as to raise and lower the cable from the spurling pipe, which is at the top and the chain or cable locker.

Anchor capstans are used in some installations where the cable lifter rotates about a vertical axis. Only the cable lifter unit is located on deck, the driving machinery being on the deck below.

1. According to the passage, the rotating units of a split windlass don't include _____.
A. a cable lifter B. a mooring drum **C. a chain locker** D. a warp end
2. The word "assembly" in the sentence "A spur gear assembly transmits the motor drive to the shaft where the various dog clutches enable the power take-off." is as the same meaning as
A. unit B. shaft C. dog clutch D. spurling pipe
3. One of the functions of a dog clutch is _____.
A. to transmit the motor drive to the shaft
B. to hold the cable lifter and the mooring drum when the power is switched off
C. to engage or disengage the rotating units of a split windlass separately
D. to handle both anchors
4. Which of the following statements is correct?
A. A more recently development, particularly on larger vessels, is the split windlass where one machine is used to handle both anchors.
B. The word "machine" in the passage refers to the windlass-
C. Anchor capstans are used in some installation where the cable lifter rotates about a horizontal axis.
D. Both the cable lifter unit and the driving machinery in the anchor capstans are located on deck.

CACB

Passage 29

Developments in lamps and fittings over the past twenty years have solved many problems such as energy consumption, ambient temperatures, shock and vibration effects. Light sources are now available for mounting in the restricted spaces between ceiling and deck.

The technique of providing the correct kind of illumination and degree of brightness, particularly in passenger ships is a matter for lighting specialists. Suffice it to say that in a passenger ship each of the public spaces, e.g. lounges, dining rooms, bars, cabins, etc., will require different treatment. Nevertheless crew accommodation in cargo ships including tankers, tends to reach a higher standard of comfort and also deserves specialist attention.

The importance of adequate and effective lighting in machinery spaces needs no emphasis. Machinery rooms are usually of great height and obstructed by gangways, piping and other interference. Narrow beam light sources, e.g. 250w fluorescent-reflector lamps in fittings with integral control gear, are desirable.

A suitably constructed fitting requires practically no maintenance being independent of atmospheric pollution. Local lighting of gauges, switchboards, etc. requires higher illumination levels. Fitting with fiberglass bodies reduce maintenance, i.e. no painting or rust problems.

In boiler rooms heat problems must be taken into account in order to maintain the correct lumen output. For the shaft funnel fluorescent diffusing fittings are most suitable.

Fluorescent lamps are unsuitable for refrigerated spaces unless the temperature is high than -5°C . At lower temperature starting can be slow and light output poor. A suitable light source is the mercury fluorescent lamp which operate down to -50°C .

1. According to die second paragraph, which of the following statement is NOT true?
A. It is important for lighting specialists to pay more attention to the lighting in a passenger ship,
B. Each of the public spaces will require different treatment in a passenger ship.

- C. Crew accommodation in cargo ships except tankers tends to reach a higher standard of comfort.
D. The lighting problems in cargo ships also draw lighting specialists' attentions.
2. According to the third paragraph, which of the following statement is true?
A. Lighting in machinery space is of very importance.
B. Machinery spaces are usually very narrow.
C. Only 250w fluorescent-reflector lamps can be used in machinery spaces.
D. Narrow beam light sources are usually obstructed by gangways, piping and other interference.
3. According to the last three paragraphs, which of the following statement is NOT true?
A. Fittings with fiberglass bodies need no painting.
B. Fluorescent diffusing fittings are most suitable for the shaft funnel.
C. Mercury fluorescent lamps are suitable for refrigerated spaces.
D. Fluorescent lamps are unsuitable for refrigerated spaces whose temperature is higher than -5°C .
4. Lighting specialists are those who _____.
A. light the lamps quickly
B. are the masters of the ships
C. are the chief engineers of the ships
D. have special interests or skills in lamps and fittings

CADD

Passage 30

Discovered a mere one hundred sixty years ago and manufactured commercially just half that long, aluminum today ranks behind only iron and steel among metals serving mankind. The key to its popularity is its incredible versatility. The same metal that makes kitchen foil serves as armor for battlefield tanks. The material of lawn chairs and baseball bats also forms the vital parts of air and space vehicles——most of their skeletons, their skins, even the rivets that bind them together.

Behind aluminum's versatility lie properties so diverse that they almost seem to belong to several different metals. For example, in its pure form, aluminum is soft enough to whittle. Yet its alloys can possess the strength of steel, with only a third of its weight. Thus, when Alexander Calder designed one of his last mobiles——a soaring creation eighty feet long——his choice of aluminum over steel cut two tons from its weight. Aluminum also assures the masterpiece virtual immortality. The instant the metal is exposed to air, its surface acquires a transparent film that seals the interior against further corrosion.

1. It can be inferred from the passage that aluminum has been marketed for how many years?
A. 40 B. 60 C. 80 D. 160
2. It can be inferred that a steel object weighing three tons would weigh how many tons if it were made of aluminum?
A. One B. Three C. Six D. Nine
3. It can be inferred from the passage that things made of aluminum _____.
A. are usually sealed with plastic film B. are not very popular as art objects
C. will last a long time D. should not be exposed to air for a long period of time
4. A transparent film is a film _____.
A. which can be seen clearly B. which is very thin enough to be seen through.
C. which is very interesting D. which is very dim

CACB

Passage 31

Almost every type of electrical apparatus is capable of giving rise to interference and even certain non-electrical equipment may also cause trouble due to generation of static electrical charges. Typical examples of the latter are

seawater-lubricated rubber or plastic bearings. In these cases electrical charges produced by the rotation of the shaft on the rubbing face of the bearing will give rise to a cracking noise in any adjacent radio set of the portable type.

Interference results from any sudden interruption or change of electrical current such as surges from switches, control gear, motor starters, etc. or it can arise from steady-state conditions which in themselves are a series of current interruptions or reversals. Examples of this type of disturbance vary from the fluorescent tube to thyristor control gear, and motors and generators of all kinds.

Erratic connections can also cause a large amount of trouble because by their nature the trouble is difficult to trace.

Most of the apparatus used in modern ships are the composite products of a number of manufacturers, e.g. a main supply system will have the generator produced by one manufacturer, the control gear by a second, surveillance device by a third, the prime mover by a fourth, and so on. Circumstances can arise therefore, where it is necessary to suppress one manufacturer's equipment in order to control interference from other component from a different manufacturer.

1. The passage is mainly about _____.
A. electrical apparatus
B. non-electrical equipment
C. seawater-lubricated rubber
D. interference
2. The following statements are considered true except _____.
A. only electrical apparatus is capable of giving rise to interference
B. seawater-lubricated rubber bearings can cause trouble due to generation of static electrical charges
C. plastic bearings can also cause trouble due to generation of static electrical charges
D. almost every type of electrical apparatus is capable of giving rise to interference
3. Which statement is true according to the last paragraph?
A. The apparatus such as the generators are produced by many manufacturers.
B. The apparatus such as the prime movers are produced by a number of manufacturers -
C. The apparatus such as the control gears are produced by a lot of manufacturers,
D. Different apparatus in one system in modern ships may be made by different manufacturers.
4. The "prime mover" in the last paragraph refers to _____.
A. the main engine
B. the air compressor
C. the A. C. generator
D. the auxiliary engine driving the A. C. generator

DADD

Passage 32

The control officer may determine if all operational requirements of Annex I of MARPOL 73/78 have been met, taking into account:

- (1) the quantity of oil residues generated;
- (2) the capacity of sludge and bilge water holding tank (s); and
- (3) the capacity of the oily water separator.

including the inspection of the oil record book. The control officer may determine if reception facilities have been used and note any alleged inadequacy of such facilities.

The control officer may determine whether the responsible officer is familiar with the handling of sludge and bilge water. The relevant items from the guidelines for systems for handling oily wastes in machinery spaces of ships may be used as guidance. Taking into account the above, the control officer may determine if the ullage of the sludge tank is sufficient for the expected generated sludge during the next intended voyage. The control officer may verify that, in respect of ships for which the Administration has waived the requirements of regulation 16(1) and (2), all oily bilge water is retained on board for subsequent discharge to a reception facility.

When reception facilities in other ports have not been used because of inadequacy, the control officer should advise the Master to report the inadequacy of the reception facility to his own flag State, in conformity with MEPC/Circ. 215 of April, 1989.

- All the following factors should be considered by the control officer except _____.
A. the quantity of oil residues generate B. the capacity of sludge holding tanks
C. the capacity of bilge water holding tanks D. the capacity of the oil separator
- The control officer may determine if the ullage of the sludge tank is sufficient for the expected generated sludge during the next intended voyage. According to this sentence, which of the following statements is true?
A. The control officer has known that the sludge tank is too small.
B. The next voyage has been decided.
C. The sludge generated during the voyage is too much to be filled into the sludge tank.
D. The ullage of the sludge tank is enough.
- MARPOL Convention is formulated by _____.
A. the Flag State B. the Port State C. the IMO D. the ILO
- The word "waive" is closest in meaning to _____.
A. wait for willingly B. suggest in willingly
C. insist on willingly D. give up willingly

DBCD

Passage 33

TWO STEP CONTROLLER ACTION is the action of a controller whose output signal changes from one predetermined value to another when the deviation changes sign. This controller action is mainly on/off control, for example, a refrigeration unit controlling room temperature, when the temperature rises to a predetermined value the refrigerating compressor motor automatically starts, then when the temperature falls to a predetermined value the motor is stopped.

PROPORTIONAL CONTROLLER ACTION is the basic action form of a continuous controller whose output signal is proportional to the deviation. In the case of a boiler water level control, if the water level in the boiler, due to increased steam demand, drops by 20 mm, then the automatic controller output to the feed water inlet valve may change from 0.6 to 0.7 bar. If the level drops by 40mm, then the automatic controller output would change from 0.6 to 0.8 bar. Offset or droop is an inherent characteristic of proportional controllers. When a load change occurs in a controlled system a proportional change occurs in the controller which results in an offset or steady state error to the desired value .

INTEGRAL CONTROLLER ACTION is the action of a controller whose output signal changes at a rate which is proportional to the deviation. It is used in conjunction with proportional control in order to remove offset inherent in the proportional controller.

DERIVATIVE CONTROLLER ACTION is the action of a controller whose output signal is proportional to the rate at which the deviation is changing. The principle object of derivative control is to give quicker response to system changes.

Sophisticated controllers for rapid response, minimum onsets and reset action would be three term controllers i.e. proportional plus integral plus derivative.

- TWO STEP CONTROLLER ACTION is mainly _____.
A. proportional control B. integral control
C. derivative control D. on-off control
- The word "offset" most probably means _____.
A. predetermined value B. measured value C. off-limit D. sustained deviation
- Which kind of the following controllers is the most sophisticated controller?
A. Proportional controller B. Integral controller
C. Derivative controller D. PID controller

4. From the passage, we can learn that the simplest controller action is _____.

- A. TWO-STEP CONTROLLER action
C. INTEGRAL CONTROLLER action

- B. PROPORTIONAL CONTROLLER action
D. DERIVATIVE CONTROLLER action

DDDA

Passage 34

With the development of modern technology, remote control and automation of a ship's main engine have been widely used on board ship. The remote control and automation of engine operations are advantageous from several points of view. First, a reduction in routine supervisory labor is permitted; particularly the unproductive night-service labor. Engine operation is supervised at the control room or bridge in a convenient manner by the monitoring system. The engine room need be manned at night only in bad weather or close waters for safety reasons and when preparing the engine.

An additional advantage is that engine trial-operation is automatically sensed and alarmed. Furthermore, in some cases remedial measures are taken automatically; as an example, in the event of failure of an auxiliary such as a lubricating pump, the standby pump is started and put on the line automatically. Thus, automatic surveillance provides an additional degree of engine safety and prolonged engine mal-operation is avoided.

The marine remote control is achieved based on either pneumatic, electronic control systems or combination of both with the electronic system acting as the system giving orders and the pneumatic one carrying out the orders. Generally speaking, the pneumatic system is more reliable and the electronic system is simple and easy to maintain.

1. Which of the followings is NOT the advantages of the remote control and automation of engine operations?

- A. Routine supervisory labor particularly the unproductive night-service labor is reduced.
B. Engine mal-operation is automatically sensed and alarmed.
C. The engine room need be manned at night in bad weather or close waters.
D. Some remedial measures can be taken automatically.

2. The marine remote control is achieved based on _____.

- A. pneumatic control system
B. electronic control system
C. either A or B
D. either A or B or combination of both A and B

3. The marked advantage of the electronic system is _____.

- A. the best reliability
B. simple in construction
C. easy to maintenance
D. both B and C

4. In the event of failure of an auxiliary such as a lubricating pump, the standby pump is started and put on the line automatically. " the line " in this sentence refers to _____.

- A. fuel manifold
B. lubricating pipe line
C. auxiliary engine pipe line
D. generator output line

CDDB

Passage 35

Product description

NALFLEET "SEA SHIELD" DISC/FILTER CLEAN is a mixture of solvents, proprietary surfactants and an organic acid. It is designed specifically for the removal of oily residues and lacquers found in fuel oil and lube oil purifiers and filters.

NALFLEET "SEA SHIELD" DISC/FILTER CLEAN does not contain any phenols, cresylic acid, chlorinated hydrocarbons and less than 10% aromatics. The formulation meets the latest regulations from MARPOL 73/78 as recommended by the Bulk Liquids and Gases (BLG) working group of the Marine Environmental Protection Committee (MEPC) of the International Marine Organization (IMO), and is approved by that committee on behalf of IMO. These

regulations, effective 1st July 1996, state that additives used for cleaning ship's tanks must contain less than 10% of a Pollution Category A product.

(Annex n of MARPOL 73/78 now states that petrochemical complex mixtures of hydrocarbons containing more than 10 wt % of C3-C8 alkylbenzenes (i.e. C9-C14 areneomatics) and/or poly (C2 and above) cyclic aromatics, are assigned to Pollution Category A.)

The formulation also meets the latest OSPARCOM regulations which ban the use of surfactants based on Alkyi Phenol Ethoxylates in cleaning products.

(The reason for this ban is that Alkyi Phenol Ethoxylates degrade in the environment to Alkyi Phenol which is persistent and slightly oestrogenic-affects the reproduction cycle of organisms)

- The product is most suitable for removing _____.
A. solvents
B. proprietary surfactants
C. organic acids
D. oily residues and lacquers
- Which of the following statements is NOT correct?
A. The product can be used not only in fuel oil purifiers and niters but also in lube oil purifiers and filters.
B. The product is a mixture of a number of substances.
C. There is not any cresylic acid in the product.
D. The product does not contain any aromatics.
- From the passage, we can learn that Annex II of Marpol 73/78 concerns on the discharging rules of _____.
A. oily water
B. poisonous liquid
C. solid garbage
D. sanitary sewage
- The word " ban " in the passage can be replaced by _____.
A. permit
B. warn
C. forbid
D. prevent

DDBC

Passage 36

Out of the many hazards that can occur on ships, fire is by far the most frequent, and results in more total losses than any other casualty. Most fires start through negligence. A number of fatal accommodation fires have been started by people falling asleep smoking in bed; engine room fires have been started by neglected oil leaks dripping on to hot pipes or exhaust manifolds whose insulation has not been replaced after maintenance. Again, thoughtless smoking habits in machinery spaces have been the cause of many severe fires.

- Which of the following hazards most often takes place on board ship?
A. Hood
B. Fire
C. Collision and grounding
D. Black out
- What is the main cause resulting in accommodation fires?
A. Oil leakage
B. Pipe hot
C. Exhaust gas
D. Smoking in bed
- _____ fires have been started by oil in the hot exhaust manifolds.
A. Accommodation
B. Beds
C. Engines
D. Machinery spaces
- We can infer from this paragraph that the main cause to make ship fires is
A. people's negligence
B. someone smoking in bed
C. leaking oil
D. exhaust manifolds being replaced

BDDA

Passage 37

Please carefully read the following table and then answer the questions according to the information from this table.

Table: types of fire extinguisher

type	Class of fire	Operation	Remarks
------	---------------	-----------	---------

	A	B	C		
Soda and acid	√	×	×	Turn upside down. Direct stream at base of fire	Should not be kept at a temp. below 5 ℃
Gas cartridge and water	√	×	×	Release gas. Hold upright . direct stream at base of fire.	
Foam	√	√	×	Turn upside down. Direct at bulkhead just above fire.	Should not be kept at a temp. below 5 ℃
CO ₂	×	√	√	Release gas. Direct discharge at base of fire and maintain slow sweeping motion.	Can be of value on class A fires. Not allowed in accommodation .
Dry powder	×	√	√	Release gas and control discharge with squeeze grip nozzle. Direct at base of fire with a sweeping motion.	Can be of value on class A fires. Needs careful aim.

- The most possible combustible materials of class A fire is
A. solid materials B. liquid materials C. petroleum gas D. electrical equipment
- Which type of fire extinguishers can be used to extinguish all classes of fires?
 A. Soda B. Water C. Foam **D. Dry powder**
- There is one type of fire extinguisher which is injected directly at base of fire making use of gas that can not be used in accommodation. Which one is it?
 A. Water B. Foam **C. CO₂** D. Dry powder
- When used to extinguish class B fire, _____ extinguisher should be turned upside down and cover fire smoothly.
 A. a soda and acid **B. a foam** C. a CO₂ D. a dry powder

ADCB

Passage 38

The CO₂ fire extinguishing installation may incorporate a smoke sampling system so that fire can be detected in the early stage at the smoke detecting cabinet, which is situated in the wheelhouse. Each cargo compartment is individually connected to the smoke detecting cabinet with small bore piping and, by a suction fan mounted on the wheelhouse roof, samples of the air in each cargo space are continually drawn up to the smoke detecting cabinet and discharged into the wheelhouse or the atmosphere through a diverting valve. Thus smoke from a fire in any cargo space can be immediately detected.

- The CO₂ fire extinguishing system may combine with _____ to detect fire in the early stage of fire development.
A. a smoke detecting system B. a wheelhouse
 C. a cargo compartment D. a crew s cabin
- The function of the smoke sampling system is _____.
 A. to analyze smoke components **B. to detect fire in the early stage**
 C. to prevent the wheelhouse from catching a fire D. to ventilate each cargo compartment
- According to this paragraph, which of the following statements is true?
 A. The smoke sampling system consists of the CO; fire extinguishing installation and smoke detecting cabinet.
 B. The smoke detecting cabinet is located on the wheelhouse roof.

- C. The suction fan draws samples of the air from cargo spaces.
D. Samples of the air flow into the detecting cabinet at regular intervals.
4. Which of the following devices does the smoke sampling system consist of?
① fire extinguishing installation; ② smoke detecting chamber; ③ wheelhouse; ④ cargo compartment; ⑤ suction fan; ⑥ diverting valve
- A. ①、②、⑤ B. ②、④、⑤ C. ③、④、⑥ D. ②、⑤、⑥

ABCD

Passage 39

Most deck machinery is idle during much of its life and due to this intermittent duty requirement, gears and drives are normally designed to a limited rating of one half to one hour. Despite long periods of idleness, often in severe weather conditions, the machinery must operate immediately, when required.

1. The word "idle" in the first line means _____.
A. not available B. slowly running C. broken down D. not in use
2. Which of the following statements is true?
A. Most deck machinery work intermittently. '
B. In general, a deck machine works continually for more than one hour.
C. The deck machinery must operate in extreme weather conditions.
D. When required, the deck machinery could run for long period of time.

The most important thing about any hydraulic system is to make sure that the hydraulic oil remains clean (regular inspection of niters) . Any protective boots fitted over rams etc. should be periodically examined as also should flexible hoses. Hydraulic hoses should have their date of manufacture printed on them and can be expected to have a life of about five years.

3. We can infer from this paragraph that it is important _____.
A. to keep the oil clean B. to inspect the niters
C. to fit the protective sleeves D. to examine the hoses
4. Which of the following statements is not true?
A. The filters should be cleaned regularly.
B. Not only should the boots be inspected, but also the hoses.
C. It spend five years to manufacture the flexible hoses.
D. We can generally find the date of production in the hydraulic hoses.

DAAC

Passage 40

A steam steam trap is a special type of valve which prevents the passage of steam but allows condensate to pass, It works automatically and is put into drain lines so that these drain off condensate automatically without passing any steam. There are three main types, namely mechanical, thermostatic and thermodynamic.

1. A steam trap is _____.
A. an auxiliary steam stop valve B. a feed water valve
C. a drain valve which prevents steam passing D. a type of blow down valve
2. A steam trap is fitted in the _____.
A. drain pipe line B. blow down line C. soot blow line D. supply steam line

A defective steam trap wastes steam. To aid detection a sight glass or test cock should be fitted after each trap so that its peribnnance can be observed. If these are not provided then the only alternative is to open up traps regularly for inspection. The only exception is the thennodynamic type. When operating correctly this gives a characteristic "click", usually at intervals of between 20 and 30s so that its performance can be checked simply by listening.

3. If the steam trap is out of order, _____.
- A. there is no steam in the drain lines B. condensate will flow in a sight glass
C. it works with sounding "click" D. the steam pressure will decrease
4. How do you judge the thermodynamic type of steam trap operating normally?
- A. To observe the sight glass fitted in the drain lines B. To open the test cock regularly
C. To open up the trap regularly D. To listen to the sound

CADD

Passage 41

A metering pump is a pump that has been designed primarily for measuring and dispensing a liquid, rather than merely transferring it from one site to another. It has to be a precisely designed piece of equipment, manufactured to close engineering limits. It is frequently used to dispense concentrated and highly corrosive liquids and for this reason considerable care has to be taken to ensure that the materials used in construction, particularly those of parts in direct contact with the liquid, will resist attack.

Most metering pumps are of the positive displacement type. They consist of a prime mover, a drive mechanism and a pumphead. Pumpheads are usually of the piston, or plunger type where the pump is to be used against high pressures; for lower pressure duties the diaphragm version is generally used. In comparing the two types, it should be realized that the plunger model is more exact in its performance than the diaphragm, whilst the diaphragm type, which requires no glands, is completely leakproof.

1. Which of the following statements is true?
- A. A metering pump is a pump which can be used not only to transfer liquids but also to measure liquids transferred.
B. A metering pump is a pump which can only be used to transfer liquids -
C. a metering pump is actually a flow meter.
D. a metering pump is actually a liquid distributor.
2. A metering pump has been used mainly to _____ -
- A, measure liquids transferred B. dispense concentrated liquids
C. meter corrosive liquids D. all of the above
3. Which of the following statements is not true?
- A. The metering pump is made of resistant corrosion materials.
B. Most metering pumps are of positive displacement type.
C. The metering pumps of piston type are leakage free.
D. The metering pumps of diaphragm are suitable for lower pressure situation.
4. Most metering pumps consist of _____.
- ① corrosive liquids; ② resistant corrosion materials; ③ prime engines; ④ drive mechanisms;
⑤ pumphead; ⑥ plunger or diaphragm
- A. ①、②、③ B. ②、③、④ C. ③、④、⑤ D. ④、⑤、⑥

ADCC

Passage 42

A variety of devices exist for detecting fires namely:

- (1) Smoke detectors based on the ionization principle or on the photoelectric cell principle;
- (2) Heat sensors;
- (3) Rate of temperature rise sensors;
- (4) Flame detectors.

Each type has its merits and most systems will deploy two or more of the above types of devices depending on the

space being protected .

Within machinery spaces, ionization smoke detectors are generally considered the first line of defense. These devices monitor the electrical charge which occurs when combustion particles reach the charged space in the detector. So that the units can be readily tested an indicator light is provided on the sensor body. This lights up in the presence of gas from a test canister or even from the fumes off a cigarette.

1. Which of the following detectors are based on the charges or light principle?
A. Smoke detectors B. Heat sensors C. Temperature rising sensors D. Flame detectors
2. In general, _____ of fire detectors are fitted on the compartment being protected.
A. one type **B. two types** C. three types D. four types
3. Within engine room, _____ sensors are arranged certainly.
A. smoke B. heat C. temperature rising D. flame
4. Which of the following statements is true?
A. The more types of fire detectors are fitted on the space being protected, the more possible it is to avoid fire hazards.
B. Flame detectors are based on the light principle of fire detection.
C. Cigarette smoking will always cause fires.
D. A test canister implies it is unnecessary to sample fumes for detection fire.

ABAA

Passage 43

Combustible gases and vapours, such as petroleum vapour, when mixed in the correct proportion with air in an enclosed vessel will burn so rapidly that an explosion occurs.' The burning can be initiated quite easily, ignition often being caused by a relatively small spark. For each gas or vapour there is, however, an upper and lower concentration of vapour in air between which an explosion can occur. These limits are referred to as the lower flammable and upper flammable limits (LFL and UFL) or, alternatively, the lower and upper explosive limits (LEL and DEL) . Petroleum vapour for instance, has an LEL of 1.4% and a UEL of 6.4% while hydrogen has an LEL of 4% and a DEL of 75% . Crude oil contains a variety of hydrocarbon mixtures and the vapour contained in crude oil tanks will exhibit a wide variety of upper and lower explosive limits.

1. Which of the following statement is not true?
A. Ignition energy of combustible vapours is small.
B. Combustible gases are easily burned.
C. Petroleum vapour can be initiated when the concentration of the vapour in air is between LFL and UFL.
D. There is a wide range of upper and lower explosive limits of crude oil.
2. The flammable range of hydrogen gas is larger than that of petroleum vapour according to this paragraph, it means _____.
A. hydrogen gas is easier to burn B. petroleum vapour is easier to ignite
C. hydrogen gas is more dangerous D. petroleum vapour is more dangerous
3. The phrase "the correct proportion with air " means _____.
A. only when the concentration of the mixture is lower than LFL, an explosion occurs
B. only when the concentration of the mixture is higher than UFL, an explosion occurs
C. only when the concentration of the mixture is within the limits, an explosion occurs
D. only when the combustible gases are in air, an explosion occurs
4. The cause of combustible gas explosion is _____.
A. they burn in an open vessel **B. they burn rapidly in an closed vessel**
C. they burn due to too much oxygen D. they burn due to lack of oxygen

DCCB

Passage 44

While carbon dioxide is used in some extinguishers as an inert propellant the gas is also used extensively as a blanketing agent. In a carbon dioxide portable extinguisher, the carbon dioxide is in liquid form and is at a pressure of 6 bar at 20°C, necessitating a far stronger container. This type of extinguisher can only be recharged ashore. To check for leakage a record should be kept of the weight of the extinguisher. Alternatively the liquid level can be determined by using a special instrument which uses a radioactive source and a Geiger-Muller counter to detect the gas/liquid interface although this method is usually only used on large fixed CO₂ installation.

This could be lethal if discharged accidentally in a confined space and for this reason this type of extinguisher is not allowed in the accommodation.

1. Which of the following statements is not true?
 - A. Carbon dioxide is usually used as a propellant.
 - B. Carbon dioxide is usually used as an extinguishing gas.
 - C. If the carbon dioxide is used as a blanketing agent, it should be pressurized.
 - D. The carbon dioxide extinguisher can only be used ashore.**
2. In what state is the carbon dioxide in the portable extinguishers?
 - A. Powder
 - B. Dry ice
 - C. Liquid**
 - D. Gas
3. How do you detect the leakage of a carbon dioxide portable extinguisher?
 - A. To record gas pressure.
 - B. To measure its weight.**
 - C. To measure its liquid level.
 - D. To monitor the radioactive source.
4. The reason that the carbon dioxide extinguisher can't be used in the accommodation is that
 - A. carbon dioxide is a toxic gas
 - B. carbon dioxide is an inertial gas**
 - C. there is a radioactive source in the extinguisher
 - D. it has no effect in a confined space,

DCBB

Passage 45

This type of extinguisher contains a charge of sodium bicarbonate powder. The container of this type extinguisher holds a steel capsule containing liquid carbon dioxide. On breaking the capsule, by depressing the knob, the gas forces all the powder out of the discharge nozzle. The powder blankets the fire in a cloud of dust, cutting off the supply of oxygen. If the fire is hot enough the sodium bicarbonate will decompose to form sodium carbonate, carbon dioxide and water all of which will aid the smothering operation and give some cooling effect. The extinguisher discharges in only 15 sec and it is thus important to aim the appliance accurately. The operating pressure of this container is higher than that of the soda-acid type. It is consequently hydraulically tested at a pressure of 35 bar.

1. What type of extinguisher does this paragraph talk about?
 - A. Dry power extinguisher**
 - B. Carbon dioxide extinguisher
 - C. Foam extinguisher
 - D. Soda-acid extinguisher
2. Which of the following statements is not true?
 - A. Carbon dioxide in the capsule is used as an propellant -
 - B. When operating this extinguisher, we should break down the capsule.
 - C. The extinguisher should be turned upside down to depress the knob.**
 - D. The blanketing agent is forced Out-
3. According to this paragraph, the extinguishing principle of _____ can be inferred.
 - A. covering the fire
 - B. cooling the temperature
 - C. smothering air
 - D. all of the above**
4. This type of extinguisher can swiftly release the sodium bicarbonate powder in _____ seconds.
 - A. 15**
 - B. 35
 - C. 20
 - D. 50

ACDA

Passage 46

Air at high pressure, i.e. at 25 bar or more, is required for starting main and auxiliary engines in motorships and in steamers, often for the latter purpose. In both, air at low pressure, say at 6 bar or less is required for much remote or temperature or pressure controlled equipment, for which purpose it must be clean and oil-free.

A typical simple h.p. air system, it is a requirement that there shall be at least two reservoirs whose combined capacity allows (all) the main engines to be started twelve times if they are reversible and six times if they are not, while the compressors are idle-

1. In the starting air system of the auxiliary engines, the air pressure should be _____.
A. less than 25 bar **B. at least 25 bar** C. less than 6 bar D. more than 6 bar
2. In the control system, the controlling air pressure should not be more than _____.
A. 25 bar B. 19 bar **C. 6 bar** D. 31 bar
3. Which of the following statements is not true?
A. In the steamer vessels the main engines are started by compressed air.
B. In the steamer vessels the auxiliary engines are started by compressed air.
C. The compressed air being used as controlling medium should be filtered.
D. There are at least two air bottles in the ships.
4. The air reservoirs should be able to start the engines _____ times when they are reversible .
A. 25 B. 6 **C. 12** D. 18

BCAC

Passage 47

A fire and bilge pump has suctions from sea, bilge main and engine room bilge, with discharges to fire main, oily water separator and overboard. A ballast pump has suctions from sea, ballast main, engine room, bilge direct and bilge main with discharges to overboard, the ballast main, the oily water separator and possibly, the main salt water circulating system. A general service pump has suctions from sea, ballast main, bilge main and engine room bilge with discharges to the fire main, the ballast main, the oily water separator and overboard, In this way, three pumps provide effective alternatives for all essential services in the event of breakdown of one or even two. Many ships will have more generous provision and all passenger ships will have a submersible fire and bilge pump, supplied with power from an emergency dynamo.

1. A ballast pump has suctions from sea, ballast main pipes, and bilge main with discharges to overboard, the ballast main and _____.
A. the fire main B. the bilge main C. the engine room **D. the main sea water system**
2. _____ has suctions from sea, bilge main and engine room bilge, with discharges to fire main, oily water separator and overboard.
A. A fire and bilge pump B. A ballast pump
C. A general service pump D. All of the above pumps
3. If the fire and bilge pump is broken, _____ can replace it.
A. a ballast pump B. a general service pump **C. a and b** D. none pump
4. Which of the following statements is not true?
A. A ballast pump can draw water from the ballast main and discharge the water into the ballast main.
B. In general, a fire and bilge pump may supply sea water for main sea water cooling circulating system.
C. There is a submersible fire and bilge pump in all passenger vessels.
D. An emergency fire pump should be powered with an emergency generator.

DACB

Passage 48

Due to the large amount of heat picked up by the air in boiler and engine rooms, it would be impracticable to maintain ambient conditions within the comfort zone by air conditioning or any other means. The normal practice is to provide copious mechanical ventilation; in boiler rooms, the quantity is equated to the combustion requirements, while in a motor ship engine room the supply may be 25 ~ 50% in excess of the requirements of the engines.

The axial flow fan is particularly suited to handle these large air volumes at the moderate pressures required, while of course the "straight-through" flow feature places it at an advantage over the centrifugal fan.

The increasing adoption of automation, with the provision of a separate control room makes less significant the fact that comfort conditions cannot be maintained in the engine room all the time.

1. Which of the following devices should be taken to maintain ambient conditions of the boiler and machinery space?

- A. Air compressor
B. Air cooler
C. Air-conditioning plant
D. Mechanical ventilation plant

2. In a motor vessel, the air quantity which the engine room need is _____ of the requirements of the engines.

- A. less than 25%-50%
B. less than 125% - 150%
C. more than 25% -50%
D. less than 125% - 150%

3. At the middle pressure and large air quantity, _____ is more suitable.

- A, an axial flow fan
B. a radial flow blower
C. a centrifugal fan
D. an auxiliary blower

4. According to this passage, which of the following statements is true?

- A. In boiler and machinery spaces, there is the air conditioning.
B. In the boiler rooms the requirement of air volume should meet 25% -50% of combustion requirement .
C. To maintain the comfort zone in the separate control room the air conditioning plant should be fitted.
D. The comfort conditions can be maintained in the engine room all the time.

DDAC

Passage 49

A centrifugal feed pump must not be operated unless it is fully primed. The pump casing should be filled before starting, the suction pipe and pipe branch to the discharge stop valve must also be full. If the water enters the pump suction by gravity, priming is unnecessary and the pump will remain full of water when shut down. To fill the pump, open the small air-valve on the top of the pump casing until water commences to flow, then shut the air-valve.

If the pump is operating with a suction lift, it may be primed either from an independent water supply or from the discharge line, or by means of a vent connection or exhauster which will evacuate the pump and suction piping of air. a foot valve must, of course, be fitted in these cases. The discharge valve and air-valves should be kept closed during the priming of the pump if done by the latter methods.

1. Which of the following should not be done before the centrifugal pump is started?

- A. Priming
B. Opening the vent
C. Closing the discharge stop valve
D. Opening the suction stop valve

2. Which of the following statements is not true?

- A. If the pump is running with a gravity, priming is important.
B. To fill the pump casing it is necessary to open the air vent.

- C. When the water flows from the air vent, it means priming has accomplished.
D. The suction pipe, the pump casing and the pipe to the discharge stop valve must be primed too.
3. According to this passage, we can infer that "A foot valve" is most probably _____ .
A. a stop valve **B. a check valve** C. an air valve D. a suction valve
4. The phrase "the latter methods" in the last sentence means _____.
A. an independent water supply system B. a gravity priming system
C. an exhauster system D. a discharge line priming system

CABC

Passage 50

The outer container of the portable foam extinguisher is similar in construction to that of the sodaacid appliance and is required to withstand the same initial test pressure of 25 bar and is retested at 21 bar every four years,

This extinguisher has a long inner container of polythene suspended from the neck ring and filled with aluminium sulphate solution. The outer container is filled to a marked level with sodium bicarbonate solution. A lead disc sits on top of the inner container and acts as a stopper. By inverting the extinguisher the disc is dislodged and the two solutions mix.

The chemical action is slow, giving time for bubbles to form.

1. Which type of extinguishers is talked about inferring from this passage?
A. A soda-scid extinguisher **B. A foam extinguisher**
C. A dry powder extinguisher D. A carbon dioxide extinguisher
2. The outer shell must be capable of withstanding pressures of up to _____ bar after four years.
A. 25 **B. 21** C. 4 D. 30
3. The inner container of this extinguisher is _____.
A. made of aluminum B. made of lead
C. fixed in the outer container **D. freed at one end**
4. When this type of extinguisher is used _____.
A. its cover should be dislodged B. the outer container should be filled with solution
C. it should be turned upside down D. the action of extinguishing should be slow

BBDC

Passage 51

Severe damage has been caused by "water hammer" when steam has been admitted to pipes containing water, especially when the run of the pipe, e.g., being inclined only slightly from the horizontal, allowed the water to have a large free surface area; this is the important point.

On steam being admitted* condensation occurs on the cool water surface, a partial vacuum develops and the water moves along the pipe at great speed; if arrested by a bend or a closed valve, very large hydraulic forces are generated and fracture follows. It should be apparent that little or nothing is gained by opening a drain at the same time as or after admitting steam. It is thus imperative that steam pipes be left draining when not in use and that master valves be first eased off their seats or "cracked" when a line is being brought into use until the pipe is thoroughly wanned. Only then should the valve be opened fully.

1. The phrase "water hammer" means _____.
A. the hammer is made of water
B. the drainage water
C. the steam condensed water in the pipes
D. the high speed in the pipe the steam condensate flows
2. The word "this" in line 3 of the first paragraph probably refers to _____.
A. water hammer B. steam entering piping

- C. the situation described in the first sentence D. the water having a large free surface area
3. According to this passage, we can not infer that _____.
- A. the water in the pipe has very high pressure
B. steam that meets the cool water surface will condense
C. the bend or a closed valve will prevent the water from moving
D. it is necessary to drain the water in the piping when admitting the steam
4. The word "cracked" in line 6 of the second paragraph probably means _____.
- A. the master valves have been fractured B. the seats of the valves have been broken down
C. the pipes and the valves have defects D. the master valves should have a slight opening
- DCAD

Passage 52

A variety of valve actuators to control the opening and closing of globe, gate and butterfly valves may be found. In some types, an electric motor, fitted with limit switches is used to turn a threaded stem through a yoke, purely substituting the action of a handwheel. In most instances, however, pneumatic or hydraulic actuators are used. These give linear motion to a piston which in the case of a globe or gate valve merely pushes or pulls the valve stem although in the case of the former the valve disc is given a slight turn on landing so that the seat is kept cleaned. In the case of a butterfly valve the 90° motion through which the disc needs to be turned can be had from a suitable scroll cam.

1. Which of the following mediums used in actuators is not mentioned?
A. Electricity B. Compressed air C. Hydraulic oil D. Spring
2. The word "the former" in line 5 means _____.
A. an electric motor B. an actuator C. a globe valve D. a gate valve
3. The word "which" in line 7 refers to _____.
A. a linear motion B. a 90° motion C. a globe D. a valve stem
4. Which of the following statements is not true?
A. The valve actuators are used to open and close the valves.
B. Electric actuators can be stopped automatically when they move to the limit position.
C. The valve discs of the globe or gate valves can only be pushed or pulled in linear motion.
D. The disc of the butterfly valve can be turned 90°.

DCBC

Passage 53

The theoretical suction lift of a pump at sea level with water at 15°C is $1.013 \times 10.2 = 10.3\text{m}$, where the barometric pressure is 1.013 bar (1 atm) and 10.2 m is the head of water equivalent to 1 bar. In practice the suction lift will exceed 7m only under very favourable conditions. This is because of friction losses in the suction pipe and because of the limitations of the pump design. Any increase in water temperature above 15°C will have a detrimental effect on the vapour pressure; e.g. at 50°C water will boil at an absolute pressure of 0.14 bar, so that the lift reduces to $10.2 \times (1.013 - 0.14) = 9\text{m}$, drastically reducing the available NPSH (net positive suction head), it follows that suction lift should be small as conditions allow and that for water temperatures above about 75°C the suction head must be positive or if this is impossible the suction pipe must be short, straight, free from interference and the speed of flow must be low, say less than 1 m/sec.

1. The theoretical negative suction head of a pump at sea level with water at 15°C and 1 atm is _____.
A. 10.3m B. 10.2m C. 7m D. 9m
2. In general, the suction lift of a pump should not exceed _____.
A. 10.3m B. 10.2m C. 7m D. 9m
3. The suction lift of a pump will _____ when any increase in the temperature of the water

delivered.

A. decrease B. increase C. be constant D. vary

4. When the water temperature is about 75^oF, the following measures may be taken except to improve suction conditions.

A. reducing the speed of flow B. shortening the suction piping
C. bringing the pump below the water level D. lowering the suction level of water

ACAD

Passage 54

The temperature at which water boils is related to its pressure, e.g., 100 °C at atmospheric pressure. This principle is employed in "flash" evaporators, i.e. heated sea water if fed into a vessel maintained at sub-atmospheric pressure, flashes into steam, is condensed by contact with tubes circulated with the salt feed and is removed by a distillate pump. Baffles suitably placed and demisters prevent carry-over of saline droplets.

If two or more vessels in series are maintained at progressively lower absolute pressure, the process can be repeated, the incoming salt feed absorbing the latent heat of the steam in each stage, with a resultant gain in economy of heat and fuel. This is known as "Cascade" evaporation, a term which is self-explanatory. In a two stage flash evaporator distiller the flash chambers are maintained at very low absolute pressure by ejectors, steam or water operated, the salt feed is heated initially by the condensing vapour in the flash chambers, secondly in its passage through the ejector condenser (when steam-operated ejectors are used) and is raised to its final temperature in a heater supplied with 1. p. exhaust steam.

1. The temperature at which water boils is _____ at sub-atmospheric pressure.

A. 100 °C B. higher than 100 °C C. lower than 100 °C D. related to water flow

2. We can infer that _____ is removed by a distillate pump.

A. heated sea water B. steam C. condensate D. salt feed

3. Based on the last sentence of the passage(underline sentence) , which of the following is true?

A. Salt feed may be heated when it passes through the ejector condenser.

B. When steam-operated ejectors are used, salt feed can not be heated.

C. Salt feed will not be raised to its final temperature in any case.

D. Salt feed need not be raised to a high temperature.

4. The main idea of this passage is _____.

A. that the saturation temperature is related to its pressure

B. about the principle of a two-stage flash evaporator

C. that the salt feed may be heated by 1. p. steam

D. that the flash chambers need be maintained at progressively higher vacuum

CCAB

Passage 55

Battery maintenance is substantially the same for both types of battery. Cell tops must be kept clean and dry, vents clear and free from deposits, terminal connections tight, free of corrosion and coated with petroleum jelly to prevent corrosion. Electrolyte levels should be checked and topped up with distilled water to cover the plates.

Safety precautions necessary during these procedures include wearing suitable protective clothing (rubber apron, rubber gloves and eye goggles) , ensuring no sources of naked light are taken into the battery room and using insulated spanners and none metallic jugs and other utensils to prevent sparks and short circuits.

In addition suitable first aid treatments should be available. Sulphuric acid splashes on the skin should be washed off with fresh water and treated with a saline solution (one tablespoon of salt to half a litre of water) . Potassium hydroxide-splashes should again be washed off with fresh water but treated with boracic powder or a boracic acid solution (one

teaspoonful of boracic powder to half a litre of water). Splashes in the eye are particularly dangerous. Liberal splashing of water in the eye, followed by washing in the aforementioned neutralizing solutions is the immediate treatment. Rapid action and large quantities of water are essential, followed by seeking qualified medical attention.

The state of charge of a cell can be checked by measuring its terminal voltage while supplying load current; the terminal voltage of an idle cell is likely to be high giving a false indication of a fully charged cell.

The terminal voltage of a fully charged alkaline cell is about 1.2V, falling to 1.09V when fully discharged.

The terminal voltage of a fully charged acid cell is about 2.0V, falling to 1.75V when fully discharged.

(The following questions are based on the passage above)

1. This passage is mainly about _____.
A. electric motor construction
B. battery maintenance
C. how to charge a cell
D. how to measure the voltage
2. What precautions should be taken during topping up the electrolyte?
A. using conducted spanners
B. using metallic jugs
C. wearing rubber gloves
D. All of the above.
3. The third paragraph discusses _____.
A. sulphuric acid
B. saline solution
C. potassium hydroxide
D. suitable first aid treatments
4. Which of the following is NOT true?
A. By measuring the terminal voltage, you can check the state of charge of a cell.
B. If potassium hydroxide splashes on the skin, you should treat it with saline of certain density.
C. The terminal voltage of a fully discharged acid cell will be higher than that of a fully charged alkaline cell.
D. None of the above is true.

BCDB

Passage 56

At appropriate intervals inspection should be made of the main propulsion plant, auxiliary machinery and steering gear spaces. Any routine adjustments may then be made and malfunctions or breakdowns can be noted, reported and corrected. During these tours of inspection bilge level should be noted, piping and systems observed for leaks* and local indication instruments also be observed.

Bridge orders must be promptly carried out and a record of any required changes in speed and direction should be kept. When under standby or maneuvering conditions with the machinery being manually operated the control unit or console should be continuously manned.

Certain watchkeeping duties will be necessary for the continuous operation of equipment or plant-the transferring of fuel for instance. In addition to these regular tasks other repair or maintenance tasks may be required of the watchkeeping personnel. However no tasks should be undertaken which will interfere with the supervisory duties relating to the main machinery and associated equipment.

During the watch a log or record will be taken of the various parameters of main and auxiliary equipment. Fuel consumption figures are used to determine the efficiency of operation, in addition to providing a check on the available bunker quantities. Lubrication oil tank levels to some extent indicates engine oil consumption. If the sump level were to rise this would indicate water leakage into the oil and an investigation into the cause must be made. The engine exhaust temperature reading should all be about the same to indicate an equal power production from each cylinder. The various temperature and pressure values for the cooling water and lubrication oil should be at, or near to, the manufacturer's designed values for the particular speed or fuel lever settings.

(The following questions are based on the passage above)

1. The first paragraph mainly about _____.

- A. what should be done during the watch
B. what should be done during tours of inspection
C. what the duty personnel should do when they begin their watch
D. all of the above
2. The watchkeeping personnel _____.
A. should note bilge level
B. should observe piping for leaks
C. should undertake required tasks not affecting their supervisory duties
D. All of the above are true.
3. Fuel consumption figures are used to _____.
A. determine the efficiency of operation B. provide a check on the available bunker quantities
C. Both A and B are true. D. Neither A nor B is true.
4. The fourth paragraph is mainly about _____.
A. why certain parameters should be recorded B. where to get these readings
C. the purpose to log the sump level D. all of the above

BDCA

Passage 57

Watch requirements

(a) Every member of the watch shall be familiar with his assigned watchkeeping duties. In addition, every member shall have with respect to that ship;

- (i) knowledge of the use of appropriate internal communication systems;
- (ii) knowledge of escape routes from machinery spaces;
- (iii) knowledge of engine room alarm systems and the ability to distinguish between the various alarms with special reference to the CO₂ alarm;
- (iv) knowledge of the positions and use of the fire-fighting equipment in the machinery spaces.

(b) The composition of an underway watch shall, at all times, be adequate to ensure the safe operation of all machinery affecting the operation of the ship, in either automated or manual mode and be appropriate to the prevailing circumstances and conditions. To achieve this, the following, inter alia, shall be taken into account:

- (i) Adequate supervision, at all times of machinery affecting the safe operation of the ship;
- (ii) condition and reliability of any remotely operated propulsion and steering equipment, their controls, control location and the procedures involved in placing them in a manual mode of operation in the event of break-down or emergency;
- (iii) location and operation of fixed fire detection, fire extinction or fire containment devices and apparatus;
- (iv) use and operational condition of auxiliary, standby and emergency equipment affecting the safe navigation, mooring or docking operations of the ship;
- (v) steps and procedures necessary to maintain the condition of machinery installations in order to ensure their efficient operation during all modes of ship operation;
- (vi) any other demands on the watch which may arise as a result of special operating circumstances,

(c) At an unsheltered anchorage the chief engineer officer shall consult with the master whether or not to maintain an underway watch.

Fitness for duty

The watch system shall be such that the efficiency of the watch is not impaired by fatigue. Duties shall be so organized by the chief engineer officer that first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and otherwise fit for duty.

Protection of the marine environment

All engineer officers and engine room ratings shall be aware of the serious effects of operational or accidental pollution of the marine environment and shall take all possible precautions to prevent such pollution, particularly within the framework of relevant international and port regulations.

(The following questions are based on the passage above)

1. What knowledge is NOT mentioned as that duty members should have?
A. Escape routes
B. Operation of radio
C. To verify whether an alarm is for fire or ordinary breakdowns
D. How to use various fire extinguishers
2. Which of the following should be paid attention to?
A. reliability of any remotely operational propulsion equipment
B. adequate supervision
C. location of fire extinguishing devices
D. All of the above.
3. The word "underway" may mean _____.
A. breakdown
B. at sea
C. at anchorage
D. in port
4. Which of the following is true?
A. The efficiency of the watch should be impaired by fatigue.
B. The personnel who take the first watch at the commencement of a voyage may not be rested.
C. All engine room members except watch keeping personnel shall know what precautions to take to prevent accidental pollution of the marine environment.
D. At an unsheltered anchorage, it is possible to maintain an underway watch.

BDBD

Passage 58

The Sulzer multi-level accumulator system for cylinder lubrication has proved particularly beneficial to good piston-running behaviour. The cylinder oil is fed to the liner surface at two levels of quills. This lubricating oil and is therefore considered to be efficient and economical. The lubrication oil pumps are driven by a frequency-controlled electric motor and the oil is distributed to the quill accumulators by oil distributors. With this solution, much less piping is required. The cylinder oil feed rate is controlled according to the engine load. Adjustments depending on the engine condition and for running-in can be easily made by using software in the engine control system.

1. What is the main idea of this passage?
A. The lubrication system of main engine
B. How to control the lubrication
C. The cylinder lubrication of main engine
D. How to make running-in easier
注：本文主要介绍苏尔寿柴油机气缸润滑的多层蓄压系统，故选 C。
2. How many tiers of cylinder oil quills
A. one
B. two
C. three
D. four
注：根据文章第一段第 2-3 行可看出，共有两层注油头（注油针），故选 B。quill 注油针。
3. How is the cylinder oil feed rate controlled?
A. according to the engine speed
B. according to the engine load
C. according to both the engine speed and load
D. not mentioned in this paragraph
注：根据文章第二段第 3 行可看出，汽缸油供油率由柴油机的负荷控制，故选 B。
4. How are the lubrication oil pumps driven?

- A. by camshaft B. by hydraulic motor
C. by pneumatic motor D. by electric motor

注：根据文章第二段第 1 行可看出，润滑油泵由电机驱动，故选 D。

CBBB

Passage 59

The clearly visible benefit of RT-flex engines is their smokeless operation at all ship speeds. This is achieved by the superior combustion performance with the common-rail fuel injection.

This system maintains the fuel injection pressure at the optimum level right across the engine speed range, ensuring optimum combustion under all operating conditions. In addition, a selective shut-off of single injectors at very low speeds and an optimized exhaust valve timing help to keep smoke emissions below the visible limit.

Sulzer RT-flex engines also have the advantage of steady running at lower speeds than engines with mechanically-controlled injection. They can run very steadily, and without smoking, at 10-12% of nominal speed, which for the RT-flex 60C is about 10-14rpm. This is made possible by the precise control of injection, together with the higher injection pressures achieved at low speed, and the sequential shut-off injectors.

1. According to the first paragraph, the advantage of common-rail injection is:

- A. smokeless operation B. shockless operation
C. noiseless operation D. no vibration operation

注：根据文章第一段第 1 行可看出，共轨喷射的优点是可使柴油机无烟运行，故选 A。

2. According to above message, RT-flex engine can optimize:

- A. fuel injection pressure B. combustion
C. exhaust valve timing D. all above

注：根据文章第二段第 1-4 行可看出，RT-flex engine 型柴油机可使燃油喷射压力、燃烧以及排气阀定时达到最佳，故选 D。optimize 使最佳。

3. when the RT-flex engine working on very low speed,

- A. the injectors will stop working
B. some injectors will be closed all the time
C. the injectors will work one by one
D. the injectors will be lifted sequentially

注：根据文章第二段第 2-4 行可看出，RT-flex engine 型柴油机在低负荷下运行时，可选择性地关闭单个喷油器，所以喷油器将一个一个地工作，而不是全部工作，故选 C。

4. The RT-flex engine can run at very low speed, this is made possible by following things except _____ .

- A. the precise control of injection
B. the higher injection pressures
C. the optimized exhaust valve timing
D. the sequential shut-off injectors

注：根据文章第三段第 3-5 行可看出，RT-flex engine 型柴油机可在非常低的转速下运行，主要是通过喷射的精确控制，更高的喷油压力，以及喷油器的顺序关闭来实现的，故选 C。

ADCC

Passage 60

The fuel injection equipment and system piping are located in a hot-box, providing maximum reliability and safety when using preheated heavy fuels. The fuel oil feed pipes are mounted directly to the injection pumps, using a specially designed connecting piece. The return pipe is integrated in the tappet housing.

There is one fuel injection pump per cylinder with shielded high pressure pipe to the injector. The injection pumps, which are of the flow-through type, ensure good performance with all types of fuel. The pumps are completely sealed off from the

camshaft compartment. The fuel injection is stopped by setting the fuel rack to zero position. For emergencies the fuel rack of each injection pump is fitted with a stop cylinder. The blocking device can be operated by operator. The fuel pump and pump bracket are adjusted in manufacturing to tight tolerances. This means that adjustments are not necessary after initial assembly.

1) How are the fuel oil feed pipes are mounted to the injection pumps?

A. Fuel oil feed pipe are integrated in the injection pumps.

B. Fuel oil feed pipes are directly mounted to the injection pumps by a connecting piece.

C. Fuel oil feed pipes are directly mounted to the injection pumps by a shielded pipe

D. Fuel oil feed pipes are mounted to the injection pumps through a filter.

注：根据文章第一段第 2-4 行可看出，燃油供油管直接通过一根专门设计的连接管与喷油泵相连，故选 B。

2) How to stop the fuel injection?

A. draw the fuel rack to zero position B. close the fuel valves

C. lift out the fuel injector D. raise the fuel pump roller

注：根据文章第二段第 3-4 行可看出，通过将燃油齿条拉到零可停止燃油喷射，故选 A。

3) after initial assembly, The fuel pump and pump bracket _____.

A. need adjusting when required B. need not adjusting at any time

C. need not adjusting at any condition **D. B+C**

注：根据文章第二段第 5-7 行可看出，喷油泵和油泵托架初次安装后，任何时候、任何情况下都不需要调整，故选 D。

4) This passage is talking about _____.

A. the construction of fuel injection system

B. the principle of fuel injection system

C. the assembling of fuel injection system

D. the adjusting of fuel injection system

注：这段文章主要在讲燃油喷射系统的结构，故选 A。

BADA

Passage 61

Apart from hermetic compressors, the most common compressor at sea today is the reciprocating compressor for use with Freon. One end of the shaft has to project through the crankcase in order to receive the motor drive, either direct coupled or belt. The sealing of this shaft presents a greater problem than the usual "shaft seal" encountered on the other mechanical items. The essential component of a typical seal is a carbon ring, stationary and sealed to the gland cover, with a flat surface against which is pressed the rotating face of a cast iron ring secured to the shaft. Oil lubrication is maintained between the rubbing faces.

To allow capacity reduction cylinder unloading gear which allows suction valves to be held open has been introduced to multi-cylinder compressors.

The regulator or expansion valve has small orifice in order to effect the desired pressure reduction and ensure that the correct volume of liquid refrigerant flows from the high pressure side of the system through to the low pressure evaporator side. For Freon system, the most common regulator is the thermostatic expansion valve, the meaning of the word "thermostatic" being that the valve is designed to maintain a constant amount of superheat temperature at the evaporator outlet.

1. Which statement is NOT correct regarding to compressors?

A. Reciprocating compressors usually have a projected shaft

B. Reciprocating compressor is usually directly coupled or has a belt drive

C. Hermetic compressors are mostly used in Freon system

D. Projected shaft has more difficulties in shaft seal than other common shafts

注：根据文章第一段第 1-2 行可看出，船上氟利昂系统最通常使用的是往复式压缩机，而不是密封式压缩机，故选

C. hermetic 密封的，project 伸出。

2. Which statement is NOT correct regarding to a typical shaft seal?

A. The stationary carbon ring is sealed to the gland cover

B. There is no contact between the stationary ring and rotating ring

C. The rotating ring is made of a cast iron

D. The rotating ring is fixed on the shaft

（输气壹注：根据文章第一段第 5 -7 行可看出，静环和动环之间是接触的。动环固定在亡轴上，由‘铸铁制成；而静止的碳环与压盖密封，故选 B。

3. Which one is NOT a function of the thermostatic expansion valve?

A. control the liquid flow

B. cause a pressure drop needed for refrigeration

C. maintain a constant amount superheat of temperature at the evaporator outlet

D. regulate the capacity of multi-cylinder compressors

注：根据文章第二段第 1-2 行可看出，热力膨胀阀可控制液体（冷剂）流量、产生制冷！所需压降，以及保持蒸发器出口恒定的过热度，但不能调节多缸压缩机的制冷量（输气量），故选 D。

4. In order to control the capacity of multi-cylinder compressors, _____ is (are) applied to the compressors.

A. a hydraulic control system

B. an unloading gear

C. pressure relays

D. pressure cut out switches

注：根据文章第二段可看出，为了控制多缸压缩机的制冷量（输气量），采用了各种卸载机构，故选 B。

CBDB

Passage 62

The great majority of large CPP have their hydraulic servomotor in the hub to operate the blade palms via push rods or a crankpin-sliding block mechanism. The hydraulic servomotor is actuated by a hydraulic circuit and controlled by control valves.

CPP in large vessels are usually fitted with combinatory controls on the bridge. These are single-lever controls, the single lever controlling both propeller pitch and engine speed, either through pneumatic circuits operated by cams driven by a common shaft, or by electronic means. In either case closed loop circuits are employed, so that feedback, of propeller position and of engine speed, balances off the control signal.

Additional control stands are often fitted on the bridge wings. These are commonly “slaves” to the main central bridge control stand.

It is usual practice to take control of both engine and CPP by separate levers in the MCR after starting machinery, switching to bridge control from the MCR before leaving harbour. It follows that the consoles housing power supplies etc. for the CPP controls are generally fitted in the MCR.

1. The blade palms of a large CPP are operated by _____.

A. the hub

B. a hydraulic servomotor

C. push rods

D. a crankpin-sliding block mechanism

注：根据文章第一段可看出，大的调距桨的桨叶是通过液压伺服器来操纵的，故选 B。servomotor 伺服器。

2. Which statement is NOT correct regarding to the single-lever controls?

- A. One single lever controls both propeller pitch and engine speed
- B. Shaft driven cams are used in pneumatic circuits for single lever controls
- C. Electronic means can not be used in combinatory controls**
- D. Combinatory controls are single lever controls

注：根据文章第二段第 1-3 行可看出，采用联合控制的单手柄控制，可由电子装置操纵，故选 C。

3. In the single-lever control system, _____.

- A. open loop circuits are employed
- B. propeller position and of engine speed are fed back to balance off the control signal**
- C. shaft driven cams used in electronic circuits
- D. engine speed will not control by the lever

注：根据文章第二段第 4-5 行可看出，螺旋桨的位置和柴油机的转速反馈与控制信号平衡，故选 B。

4. As a general rule, before leaving harbour, the CPP will be controlled from (by) _____.

- A. bridge**
- B. MCR
- C. duty officer
- D. the master

注：根据文章第四段 1-2 行可看出，通常离开港口后，调距桨由驾驶室控制，故选 A。

BCBA

Passage 63

Port State Control (PSC) is the inspection of foreign ships in national ports for the purpose of verifying that the condition of the ship and its equipment comply with the requirements of international conventions and that the ship is manned and operated in compliance with applicable international laws. The primary responsibility for ensuring that a ship maintains a standard at least equivalent to that specified in international conventions rests with the flag State and if all flag States performed their duties satisfactorily there would be no need for port State control. Unfortunately this is not the case as evidenced by the many marine accidents around the world - hence the need for additional control.

The authority for exercising PSC is the national law based on relevant conventions. It is therefore necessary for a port State to be Party to those conventions and to have promulgated the necessary legislation before exercising PSC. In accordance with the provisions of the applicable conventions, Parties may conduct inspections of foreign ships in their ports through Port State Control Officers (PSCOs).

1. The purpose of PSC is _____.
- I. to check and inspect foreign ships
 - II. to verify the condition of a ship in compliance with requirements of international conventions;
 - III. to make sure that the ship is manned and operated well;
 - IV. to detain ships
- A. I+II
 - B. II+III**
 - C. III+I
 - D. I+II+III+IV

注：根据文章第一段第 1-4 行可看出，港口国监督的目的是验证船舶的状况是否符合国际公约的要求，确认船舶有正常配员并且运行良好，故选 B。

2. Who will be responsible for ensuring that a ship maintains a standard at least equivalent to that specified in international conventions?
- A. PSCOs
 - B. Ship owners
 - C. Flag states**
 - D. Port states

注：根据文章第一段第 4-5 行可看出，船旗国负责确保船舶维持一个相当于国际公约规定的最低标准，故选 C。

3. Before exercising PSC, a port state should_____.

- A. become a contracting Party and promulgate regulations for implementing PSC
- B. inform ship owners
- C. establish procedures
- D. inform shipping companies

注：根据文章第二段第 1-3 行可看出，进行 PSC 检查之前，港口国应成为缔约国并颁布履行 PSC 检查的法规，故选 A。Promulgate 颁布，implement 履行，执行。

4. PSC inspection is implemented by_____ through_____.

- A. flag states/PSCOs
- B. plag states/ship owners
- C. port states/PSCOs
- D. port states/ship owners

注：根据文章第二段第 4-5 行可看出，港口国通过 PSC 官员进行 PSC 检查，故选 C
BCAC

Passage 64

Once detected the presence of a fire, it must be made known quickly to as many people as possible. It is essential therefore that the bridge is informed of the location and extent of the fire. A small fire might reasonably be immediately tackled by the finder but attempts should be made whilst fighting the fire to attract attention. Shouting 'Fire', banging on bulkheads, deliberately setting off equipment alarms in the vicinity, all are possible means of attracting attention. Anyone finding a fire must decide whether to fight it immediately or whether to leave it and inform others first. The more people who know of a fire the greater the efforts that can be brought to bear upon it. If in doubt—inform!

Ships are built to contain fires in the space where they begin. Fire resisting bulkheads and decks are positioned at appropriate distances in order to limit the spread of fire, and it remains for fire fighting personnel to ensure that these barriers are secure whilst attempting to fight the fire. All doors and openings should be closed, all ventilation and exhaust fans stopped, and flammable material isolated from the space. It should be remembered that a fire exists in three dimensions and therefore has six sides, so it must be contained on six sides.

1. According to the passage, once a large fire detected, _____ should be informed immediately.
 - A. chief engineer
 - B. bridge
 - C. master
 - D. deck officer

注：根据文章可看出，一旦发生大的火灾，应立刻通知驾驶室，故选 B。

2. All of the following methods that may possibly be used to give alarms to others in case of a fire are mentioned in the passage except _____.
 - A. shouting
 - B. banging on bulkheads
 - C. setting off equipment alarms
 - D. phoning

注：根据文章第一段第 4-6 行可看出，可通过大声呼喊、拍打舱壁以及使用设备报警来发出报警，故选 D。bulkhead 舱壁。

3. Fire resisting bulkheads and decks provide barriers to_____.

- A. control the spread of fire
- B. form a room for fire fighting personnel

- C. secure fire fighting personnel
- D. isolate fire fighting personnel

注：根据文章第二段第 1-3 行可看出，阻火舱壁和甲板为控制火灾扩散提供了保护屏障，故选 A。

4. Which one is NOT right for fire fighting?
- A. doors and openings to be closed
 - B. exhaust fans to stopped
 - C. fire to be controlled best in one direction
 - D. flammable material to be isolated

注：根据文章第二段第 4-6 行可看出，灭火时门和通道要关闭，抽风机停掉，隔离易燃材料。不能只从一个方向来控制火灾，要从六个面来控制，故选 C。

BDAC

Passage 65

With many small package boilers, the automatic control sequence usually ensures that the boiler fire is initially ignited from a diesel oil supply, and changed over to the usual source when ignition is completed. With good management, to facilitate subsequent starting from cold, the fuel system of large boilers will have been flushed through with diesel oil when the boiler was on light duty immediately prior to being secured. When burning such diesel fuel it is essential for safety that only the correct (small) burner tip should be used. It should be kept in mind that if fire does not light, immediately shut off fuel and vent furnace.

Complete ignition of fuel in the furnace is essential. The burner flame, the smoke indicator and the funnel should be frequently observed. With satisfactory combustion, the flame should appear in candescent (白热的) with an orange shade at the flame tip, and a faint brownish haze should show at the funnel. If on first ignition the flame is uncertain, badly shaped and separates from the primary swirler, momentary opening or closing of air register may correct.

1. Small package boilers will use _____ while being lit up.
- A. the usual source of oil
 - B. fuel oil
 - C. diesel oil
 - D. mixture of fuel oil and diesel oil

注：根据文章第一段第 1-2 行可看出，小型总装式锅炉用轻柴油点火，故选 C。

2. After large boilers being secured, the fuel in the feeding line will be_____.
- A. the usual source of oil
 - B. fuel oil
 - C. diesel oil
 - D. mixture of fuel oil and diesel oil

注：根据文章第一段第 3-5 行可看出，大型锅炉停炉前应用柴油冲刷燃油管路，因此停炉后供油管路中的燃油是柴油，故选 C。

3. If large boilers were not lit up, _____.
- A. feed water to normal level
 - B. stop fuel supply immediately and purge the furnace
 - C. light the boiler again
 - D. reset the burner

注：根据文章第一段第 6-7 行可看出，大型锅炉若点火失败，应立即切断燃油并吹扫炉膛，故选 B。

4. An indication for a good combustion is _____.
- A. white smoke
 - B. brown haze in the funnel
 - C. orange flame tip**
 - D. swirl oil spray

注：根据文章第二段第 2-3 行可看出，当燃烧良好时，火焰前端呈桔黄色，故选 C。

CCBC

Passage 66

The main starting valve (automatic valve) is operated by a pneumatic actuator, and similar actuator controls are fitted for slow turning and to the distributor or timing valves. The main starting valve can be locked shut and this must be done before the engine turning gear is engaged. When this valve is open, air passes through a non-return valve and flame arrester to the main manifold supplying pressure to the cylinder valves, one of which is fitted to each cylinder of the engine.

The cylinder air start valves are normally held closed by a compression spring together with cylinder pressure acting over the valve lid. Air from the manifold enters these valves where it forms a pressure balance between the underside of the valve lid and a balance piston of equal area on the valve spindle. Consequently this does not cause the valve to open.

Cylinder valves are opened when operating air, transmitted from the distributor, applies pressure to the larger operating piston on the valve spindle. As the valve is forced open, starting air from the manifold enters the cylinder, applying pressure on the piston and causing the engine to rotate in the corresponding direction. To close the cylinder valves the connection from the distributor is opened to atmosphere, allowing the spring to close the valve and return the operating piston.

1. The timing valves (in the first paragraph) refer to _____.
- A. the valves for slow running
 - B. fuel valves
 - C. the distributor**
 - D. not mentioned

注：根据文章第一段第 1-2 行可看出，定时阀指的就是空气分配器，故选 C。

2. After the main starting valve opens, air will supply to _____.
- A. the flame arrester
 - B. each cylinder valve
 - C. a non-return valve
 - D. All of the above**

注：根据文章第一段第 4-5 行可看出，主起动阀开启后，空气将流经止回阀、阻焰器至每个气缸起动阀，故选 D。
flame arrester 阻焰器。

3. The balance piston used on a cylinder air start valve is to _____.
- A. increase acting area
 - B. keep pressure balance and help the valve close before operating air applied**
 - C. increase the force and help the valve open after the operating air applied
 - D. cause the valve to open

注：根据文章第二段可看出，气缸起动阀中的平衡活塞是用来保持压力平衡，并在空气供入之前保持阀门关闭，故选 B。

4. After the engine being started, the air in the distributor will _____.

- A. be vented to open air
- B. be leaded to the corresponding cylinder
- C. be trapped until engine stops
- D. return to air reservoir

注：根据文章第三段第 3-4 行可看出，柴油机启动后，空气分配器的空气将放到大气，故选 A。

CDDA

Passage 67

Fuel to be used is first transferred from storage tanks to a settling tank in which it is heated to allow some water and sludge to settle out by gravity and be drained off. The fuel is then passed through the purification system and discharged to a daily tank. There are usually two daily tanks, used alternately, one in use while the other is being recharged. Settling and service tanks are lagged to conserve heat.

A recommended standard of treatment for residual fuel to be used in a large engine requires two centrifuges of adequate capacity, operating in series. The first acts as a purifier to remove water, solubles, sludge etc while the second acts as a clarifier to remove solids. The purifier must be fitted with the correct disc or dam to match the oil density. The oil is heated before purification (max.temp.98°C) and the rate of throughput is limited to assist efficient separation. Both centrifuges must be cleaned frequently. Such systems can operate effectively on oils of densities up to 0.99.

From the service tanks the treated oil is pumped through a pressurized fuel system to the engine. With the oil temperatures necessary for high viscosity fuel, and the possibility that a trace of water may still be present, it is necessary to maintain the engine pump suctions and circulating connections under pressure to inhibit boiling, gasification and capitation.

1. Which is the correct order for the residual oil transfer _____.
- A. double bottom tank-settling tank-purifier-clarifier-daily tank-engine
 - B. storage tank-settling tank-centrifuges-daily tank-engine
 - C. storage tank-centrifuges-settling tank-daily tank-engine
 - D. double bottom tank-purifier-clarifier-daily tank-engine

注：根据文章第一段可看出，渣油输送的正确顺序是：储存柜—沉淀柜—分油机—日用柜—柴油机，故选 B，

2. A dam should be choosed according to the _____ of the oil being treated.
- A. Temperature
 - B. density
 - C. pressure
 - D. viscosity

注：根据文章第二段第 3-4 行可看出，根据要处理的油的密度来选择比重环，故选 B。阻水环，比重环。

3. The second centrifuge is used to remove _____.
- A. water
 - B. solubles
 - C. sludge
 - D. solid particles

注：根据文章第二段第 1-3 行可看出，串联工作的第二台分油机是用来分离固体杂质的，故选 D。

4. The engine oil pump suction is maintained at a pressure in order to _____.
- A. prevent oil from boiling
 - B. main a good suction
 - C. inhibit cavitation
 - D. all of the above

注：根据文章第三段第 3-4 行可看出，柴油机油泵吸口保持一定的压力是为了保持良好的吸入性能，防止燃油沸腾和气蚀，故选 D。

BBDD

Passage 68

The simple centrifugal pump is used for seawater circulation and other duties where self-priming is not a requirement. When installed for bilge pumping or ballast duty, these pumps require a primer i.e. some means of removing air from the suction pipe so that the liquid to be pumped is caused to flow into the pipe and so to the eye of the impeller.

For general duties, the impeller of a centrifugal pump is of aluminum bronze keyed and secured to a stainless steel shaft. The impeller is fully shrouded (遮蔽, 封闭) and of the single entry type. The renewable wear rings are of aluminum bronze and the casing is normally of bronze or cast iron. The cover has a hub containing the shaft bearing at the bottom and, above, either a packed gland or a mechanical seal. The shaft bearing is of phenolic resin asbestos (苯酚树脂石棉), lubricated by the liquid being pumped except for pumps operating on high static lift. These have grease lubricated bronze bearings to ensure adequate lubrication during the priming period.

1. Simple centrifugal pumps need a primer when used for all of the following duties but _____.

- A. seawater circulation
- B. bilge pumping
- C. ballasting
- D. deballasting

注：根据文章第一段第 1-3 行可看出，离心泵用于舱底水的泵出、压载及排出压载时都需要自吸装置，而用于海水循环则不需要，故选 A。

2. A primer used in a simple centrifugal pump is to _____ I. remove air from suction pipe line, II. lead water to the suction pipe.

- A. only I
- B. only II
- C. both I and II
- D. neither I nor II

注：根据文章第一段第 3-4 行可看出，离心泵是自吸装置是用来排出吸入管路的空气并让水进到吸入管，故选 C。

3. Which one is NOT a feature of the centrifugal pump used for general duties _____.

- A. aluminum bronze impeller with a single entry eye
- B. cast steel casing
- C. stainless steel shaft
- D. renewable wear rings

注：根据文章第二段第 1-4 行可看出，普通的离心泵采用单侧吸入的铝青铜叶轮、不锈钢轴、可更换的承磨环以及青铜或铸铁的壳体，不采用铸钢的壳体，故选 B。wear ring 承磨环。

4. The shaft bearing of a pump operating on high static lift will be lubricated by _____.

- A. lube oil
- B. the liquid being pumped
- C. grease
- D. the leaked liquid

注：根据文章第二段第 5-7 行可看出，静吸高大的泵的轴承要采用油脂润滑，故选 C。

ACBC

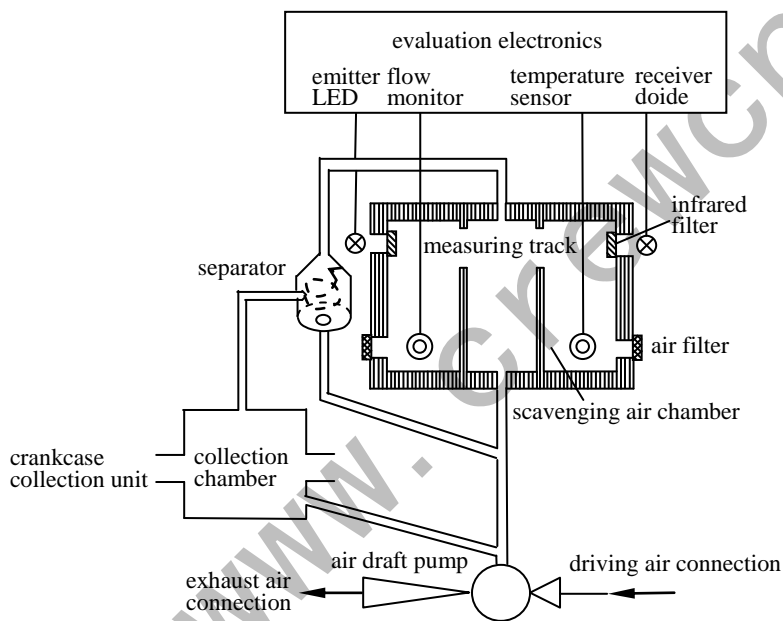
Passage 69

Via the crankcase connection unit, the crankcase atmosphere is supplied to a separator in the base plate, where large

particles are separated off with the aid of the centrifugal force. The oil separated off in the crankcase connection unit and in the separator is directly ducted off, via the oil drain ducts, to the air draft pump in the base plate and then out of the unit, so that it is not supplied to the opacity measuring track at all.

From the separator, the sampled crankcase atmosphere is fed to the opacity measuring track in the measuring unit. In order to avoid soiling of the infrared filters by the crankcase atmosphere, a certain amount of fresh air is continuously drawn in from the vicinity of the measuring unit via one air filter in each of the two so-called scavenging air chambers. This fresh air prevents the crankcase atmosphere from entering into contact with the infrared filters. After passing the optical measuring track, the crankcase atmosphere is fed to the air draft pump. The air leaving the air draft pump contains the crankcase atmosphere and leak oil from the separator and the crankcase connection unit, and is fed to the bilge or the leak oil channel of the engine.

The optical measuring track includes an infrared light emitting diode generating a certain lighting intensity at the photodiode sensitive to infrared light. The photodiode convert the lighting intensity into an electrical signal which is fed to the electronic evaluation unit. If the crankcase atmosphere contains oil mist, part of the infrared light is absorbed in the measuring track. As a result, the electrical signal is weakened. A higher opacity of the crankcase atmosphere will produce a lower electrical signal. This electrical signal is monitored in the electronic evaluation unit for falling short of a minimum threshold value. This means for the opacity of the crankcase atmosphere that it is monitored for exceeding a maximum threshold value.



1. According to this passage, the oil separated off in the crankcase connection unit and in the separator is directly ducted off and finally fed to **B** .

- A. the opacity measuring track
- B. the bilge or the leak oil channel of the engine**
- C. the scavenging air chambers
- D. the collection chamber

注：根据文章第一段第 2-4 行可看出，曲轴箱连接管和分离器中分离出来的油直接通过管道排出并最终排到舱底或柴油机的漏油管道，故选 A。

2. If the infrared filters were soiled by the crankcase atmosphere, what would take place?

- A. the oil mist detector would produce an oil mist alarm.**
- B. the air draft pump would increase its output
- C. the built-in heating unit would put into operation
- D. the sintered bronze air filters would by large particles

注：根据文章第三段可看出，如果红外滤器被曲轴箱空气弄脏，油雾探测器就会发出油雾报警，故选 A。infrared 红外的。

3. Which generate the infrared light in the optical measuring track?

- A. the sintered bronze air filters B. the infrared filters
C. **the emitting diode** D. the photodiode

注：根据文章第三段第 1-2 行可看出，发光二极管在光测量室中发出红外线，故选 C。

4. When the oil mist in the crankcase atmosphere exceeded a maximum threshold value, an electrical signal produced by the photodiode would

- A. increase to a minimum threshold value
B. **decrease to a minimum threshold value**
C. remain constant without variation
D. absorb the most intensive infrared light

注：根据文章第三段第 6-8 行可看出，当曲轴箱空气的油雾浓度超过最大的阈值时，光电二极管产生的电信号就会降低到最小阈值，故选 B。threshold 阈值（临界值）。

BACB

Passage 70

Spark erosion is caused by a voltage discharge between the main bearing and journal surface. The cause of the potential is the development of a galvanic element between the ship's hull, sea water, and the propeller shaft/crankshaft.

The oil film acts as a dielectric. The puncture voltage in the bearing depends on the thickness of the oil film. With increasing engine ratings, the specific load in the main bearing is increased. This will reduce the oil film thickness, and enable the discharge to take place at a lower voltage level.

Since the hydrodynamic oil film thickness varies through a rotation cycle, the discharge will take place at roughly the same instant during each rotation cycle, i.e. when the film thickness is at its minimum. The roughening will accordingly be concentrated in certain areas on the journal surface. In the early stages, the roughened areas can resemble pitting erosion. but later, as the roughness increases, the small craters will scrape off and pick up white metal-hence the silvery white appearance.

Therefore, to ensure protection against spark erosion, the potential level must be kept at maximum 80 mV, which is feasible today with a high efficiency earthing device. If an earthing device is installed, its effectiveness must be checked regularly.

Spark erosion is only observed in main bearings and main bearing journals.

1. According to the paragraph one, a voltage between the main bearing and journal surface is produced by .
A. propeller rotation B. leakage from M/E electric control unit
C. **a galvanic element** D. friction between the main bearing and journal surface

注：根据文章第一段第 2-3 行可看出，主轴承和轴颈表面之间的电压是由镀锌元件产生的，故选 C。galvanic 镀锌的。

2. engine ratings increase, the hydrodynamic oil film between the main bearing and journal surface is.
A. The lower/thinner B. The higher/the thicker
C. The lower/thicker D. **The higher/thinner**

注：根据文章第二段第 2-4 行可看出，柴油机的额定功率增加得越多，主轴承和轴颈表面的液体动力油膜就越薄，故选 D。

3. When will the spark erosion take place on the journal surface during each rotation cycle?

- A. **when the film thickness is at its minimum**
B. when the film thickness is at its maximum
C. when the engine is on its compression stroke
D. when the engine is on its exhaust stroke

注：根据文章第二段第 4-6 行可看出，在每转回过程中，当油膜厚度最小时就会发生电火花腐蚀，故选 A。spark erosion 电火花腐蚀。

4. During the engine room watch keeping, which equipment must be noted to ensure protection against spark erosion?

- A. the antifouling plant

- B. the earthing device
- C. the main engine electric heating coils
- D. the shaft generator

注：根据文章第三段可看出，在机舱值班过程中，要注意经常检查接地设备，防止发生电火花腐蚀，故选 B。earthing device 接地设备。

CDAB

Passage 71

Pressurized oil atomization is used for smaller capacity burners. The nozzle is located at the end of the oil gun. In the nozzle a number of small holes are oriented to assure the rotating flow for atomizing and spraying the oil in the most efficient way. As the geometry of the nozzle is fixed the velocity in the small holes and slits in the nozzle depends upon the load on the burner. The higher load the higher velocity and thereby the better atomization. On the other hand this means that the lower load the lower velocity and thereby the poorer atomization. Typically pressurized jet atomization is efficient for a turndown ratio 1:2, i.e. 50 % load. At lower load, the atomization will not be satisfying and this means non-satisfying combustion quality eventually causing soot formations. The oil pressure varies between 5 and 20 bar. As mentioned ensuring the correct distribution of air and fuel is vital for the combustion efficiency. One of the most important parameters that affects the combustion of the oil heavily is the angle of atomization that is a characteristic parameter for the specific nozzle. For the pressurized jet burners the swirl of the combustion air is created by means of a swirler. Depending upon the nozzle the required normal operation pressure for the pressurized jet burners is approx. 20 bar.

1. According to paragraph 1, we can draw a conclusion that

- A. the fuel oil should be filtered before being supplied to a pressurized jet burner.
- B. the pressurized jet burner is suitable for waste oil.
- C. the pressurized jet burners can be used for higher capacity boilers
- D. all of the above

注：根据文章的第一段可得出结论，燃油在进到压力式喷油器前必须要过滤，才能保证雾化，避免喷孔堵塞，故选 A。

2. For a certain pressurized jet burner, what is the factor that determines the fuel oil velocity in the small holes and slits in the nozzle?

- A. the geometry of the nozzle
- B. the load on the burner
- C. the temperature of the fuel oil
- D. the number of holes in the nozzle

注：根据文章第二段第 1-3 行可看出，对于某一压力式喷油器，燃烧器的负荷决定了燃油在喷嘴小孔和槽中的速度，故选 B。

3. Which of the following statements is NOT true?

- A. the higher the burner load is , the higher the fuel oil velocity in the small holes is
- B. the higher the burner load is , the lower the fuel oil velocity in the small holes is
- C. the lower the burner load is , the lower the fuel oil velocity in the small holes is
- D. the higher the burner load is, the better the atomization of fuel oil is

注：根据文章第二段第 2-3 行可看出，燃烧器的负荷越大，喷嘴小孔中的燃油速度越大，故选 B。

4. What is the most important for the combustion efficiency?

- A. the angle of atomization
- B. the load of the burner

C. the correct distribution of air and fuel

D. the velocity in the small holes and slits in the nozzle

注：根据文章第二段第 7-8 行可看出，空气和燃油的正确分布对于燃烧效率是最重要的，故选 C。

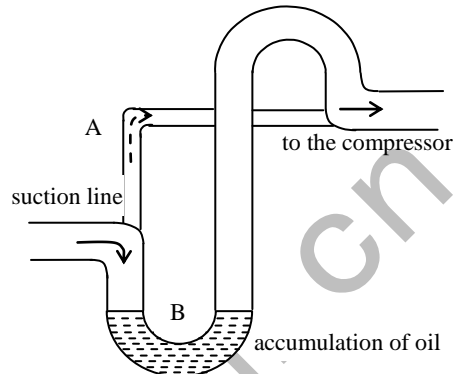
ABBC

Passage 72

For a certain provision cooling plant, the capacity regulator is generally controlled depending on pressure, temperature or relative humidity. The pulse emitter is therefore either a pressostat(压力继电器), thermostat or hygrostat. The switching difference of the control units should be rated as large as possible. This applies in particular to control by means of the pressure, because change to the load in the refrigeration circuit results in relatively quick pressure changes compared to temperature, which can in turn lead to inadmissible oscillation of the

Under partial load, the suction volume and thus the gas marked changes depending on the regulation stage. For this and routing of the suction line must be given particular to guarantee sufficient oil return, neither full load nor operation may allow the gas speed to fall below a minimum horizontal pipe sections; 8 m/s in vertical pipes.

For this reason we recommend that vertical pipes be separate sections (as illustration). As a result of the falling velocity in partial load operation, the pipe elbow B is blocked by an accumulation of oil. This increases the gas velocity in pipe section A. In order to guarantee adequate oil return, both cross sections must be rated so large that the velocity does not fall below the minimum level in full and partial load operation. In plants with extensive pipe systems it is recommended at least for R22 and NH3 to install an additional oil separator. This reduces the oil circulation period and can have positive effects above all for cold starts with relatively high oil ejection.



speed can undergo reason, the rating attention. In order partial load level: 4 m/s in

staggered into two suction gas speed

1. According to paragraph 1, if the pulse emitter were a pressostat and its switching difference were set smaller than normal, what would occur for a certain provision cooling plant?

A. liquid stroke in compressor during start up

B. capacity regulator oscillation

C. compressor starts and stops too often

D. compressor fails to start

注：根据文章第一段第 3-7 行可看出，假如脉冲发射器是一个压力继电器，它的开关差（幅差）设定值比正常值低，就会导致制冷量调节器振荡，故选 B。Oscillation 振荡。

2. What is the main factor that affecting the oil return from the suction line?

A. the load of refrigerating compressor

B. the suction volume of refrigerating compressor

C. the refrigerant gas speed in suction line

D. the capacity of refrigerating compressor

注：根据文章第二段可看出，影响吸气管回油的主要因素是吸气管中的冷剂气体速度，故选 C。

3. According to the passage, which of the following statements is NOT true?

A. the oil return is relative easy under partial load

B. the oil return is relative easy under full load

C. the refrigerant gas speed is higher under full load

D. the pipe elbow B is blocked by an accumulation of oil under partial load

注：根据文章第二、三段可看出，回油在全负荷时相对容易些，因为此时冷剂气体速度大些，而在部分负荷时，弯

管 B 易被积油堵塞，故选 A。

4. When the refrigerating plant is under full load, the refrigerant gas can return to the compressor through .

- A. the pipe elbow A
- B. the pipe elbow B
- C. both A and B
- D. either A or B

注：根据文章插图可看出，制冷装置在全负荷时，冷剂气体通过弯管 A、B 返回压缩机，故选 C。

BCAC

Passage 73

Scavenge port inspection provides useful information about the condition of cylinders, pistons and rings, at low expense. The inspection consists of visually examining the piston, the rings and the lower part of the cylinder liner, directly through the scavenge air ports. To reduce the risk of scavenge box fire, remove any oil sludge and carbon deposits in the scavenge air box and receiver in connection with the inspection.

The port inspection should be carried out at the first stop after a long voyage, e.g. by anchoring if possible, to obtain the most reliable result with regard to the effectiveness and sufficiency of the cylinder lubrication and the combustion cycle (complete or incomplete).

A misleading result may be obtained if the port inspection is carried out after arrival at harbor, since manoeuvring to the quay and low-load running, e.g. river or canal passage, requires increased cylinder oil dosage, i.e. the cylinders are excessively lubricated. Further, during low load, the combustion cycle might not be as effective and complete as expected, due to the actual fuel oil qualities and service (running) condition of the fuel injection equipment. It is highly recommended to take this information into consideration.

1. The components of an engine involved in normal scavenge port inspection comprise .

- A. the piston
- B. piston rings
- C. the lower part of the cylinder liner
- D. all of above

注：据文章第一段第 2-3 行可看出，正常扫气口检查的部件包括活塞、活塞环及缸套的下部，故选 D。

2. If the scavenge box had too much oil sludge and carbon deposits, what would occur?

- A. excessive cylinder oil consumption
- B. the scavenge box fire
- C. the crankcase explosion
- D. excessive wear of the cylinder liner

注：根据文章第一段第 3-5 行可看出，假如扫气箱有过多的油渣和积碳，就会发生扫气箱着火，故选 B。

3. In order to obtain the most reliable result with regard to the effectiveness and sufficiency of the cylinder lubrication and the combustion cycle, when should the scavenge port inspection be carried out?

- A. at the first stop after a long voyage, e.g. by anchoring if possible
- B. at the first stop after arrival at harbor
- C. at the first stop after low load running
- D. at the first stop after passing river or canal passage

注：根据文章第二段可看出，为获得气缸润滑和燃烧循环的有效性和充分性的最可靠结果，就要在长航线的第一次停车，可能的话在抛锚时就进行扫气口检查，故选 A。

4. What is the reason that the scavenge port inspection shouldn't be carried out after arrival at harbor?

- A. The main engine requires increased cylinder oil dosage during manoeuvring
- B. the combustion cycle might be ineffective and incomplete under low load operation
- C. both A and B

D. either A or B

注：扫气口检查不能在抵达港口后再进行检查的原因是：主机在机动操纵时要增加气缸油供给，在低负荷运行时燃烧循环可能效率低和不完全，故选 C。

DBAC

Passage 74

The centripetal pump discharges the clarified oil under pressure. It operates on the reverse principle as a centrifugal pump. In the latter case the impeller, which has inclined vanes, rotates in a stationary casing. The liquid being pumped flows out from within the pump through the impeller vane channels. The reverse is the case with the centripetal pump. It is fixed to the hood of the separator, and its disc, which is provided with channels, is immersed in the liquid rotating with the bowl.

The oil is peeled off by the centripetal pump and flows into its spiral channels from outside, its kinetic energy being converted into pressure energy.

When the back pressure is low, the depth of immersion of the centripetal pump in the oil is small. It can, however, be increased by throttling the valve in the discharge line. In this way, a good liquid seal is obtained and the liquid does not come into contact with the air and remains free of foam. In addition, high back pressure is obtained, so that delivery heads of up to max. 20m water column can be achieved.

1. As to the working principle of the centripetal pump, which of the following statements is NOT true?

A. the centripetal pump operates on the reverse principle as a centrifugal pump

B. the liquid in which the disc of a centrifugal pump is immersed keeps rotating.

C. the disc of a centripetal pump rotates during operation

D. the oil enters into a centripetal pump centripetally and leaves it axially

注：根据文章第二段可看出，在运行中向心泵分离片是不动的，而浸没分离片的液体是转动的，故选 C。centrifugal pump 向心泵。

2. What kind of energy conversion takes place after the oil passing through a centripetal pump

A. kinetic energy is converted into pressure energy

B. pressure energy is converted into kinetic energy

C. kinetic energy is converted into heat energy

D. kinetic energy is converted into mechanical energy

注：根据文章第二段第 3-4 行可看出，油通过向心泵后，动能转变成压力能，故选 A。

3. What methods should be adopted in order to maintain a good liquid seal in the centripetal pump?

A. regulate a valve in the discharge line

B. regulate a valve in the suction line

C. increase the speed of the bowl

D. decrease the speed of the bowl

注：根据文章第三段第 2-4 行可看出，为了保持向心泵良好的液封，在排出管路采用一个调节阀，故选 A。

4. If the bowl speed of separator is decreased, the discharge pressure of centripetal pump will

A. increase

B. decrease

C. remain constant

D. increase at first, then decrease

注：根据文章第二段可看出，油通过向心泵后，动能转变成压力能，如果分油机的分离筒速度降低，向心泵的排出压力就会降低，故选 B。

CAAB

Passage 75

Following a security incident, in which the response measures outlined in the Ship Security Plan (SSP) have been activated, {here will be a thorough review of their effectiveness and details will *be* made available, on request, to persons duly authorized by the Ship's Flag State Administration.

The Ship Security Plan is not subject to detailed inspection (other than confirming its existence on the ship) by duly authorized officials of a port State unless there are "clear grounds" to believe that the ship is not in compliance with the requirements of SOLAS or the ISPS Code, and the only means to verify or rectify the non-compliance is to review the relevant sections of the Plan. In such cases, access to the Restricted parts of the Plan relating to the non-compliance is exceptionally allowed, but only with the consent of the Flag State, or the master. If the master, in his professional judgment, believes that such "clear grounds" exist, and allowing access to relevant sections of the Restricted part of the Plan might resolve the situation, such access can be exceptionally granted. However, this should be immediately reported by the ship to the Company Security Officer (CSO). If access to the Restricted part of the Plan is denied by the master, this should be immediately reported by the Company Security Officer for guidance and reference to the Flag State.

The Confidential part of a SSP cannot be subject to non-flag State inspection unless otherwise agreed by the contracting governments concerned. Any such request or demand by port state officials to view sections of the Confidential part of the Plan will be immediately reported by the ship to the Company Security Officer for guidance and reference to the flag State before any details are revealed to non-flag State officials. The Confidential provisions, which from an integral part of this Plan, are held by the Ship Security Officer (SSO).

1. After a security incident, the revision of the SSP will made by ___

- A. the CSO
- B. the SSO
- C. persons duly authorized by the Ship's Flag State Administration**
- D. information not given

注：根据文章第一段可看出，保安事件发生后，船舶保安计划要由船旗国主管机关正式授权的人员进行审核，故选C。

2. Which statement is True?

- A. The Port State Control Officer has no right to check a SSP.
- B. The Master has the right to refuse the request from a Port State Control Officer to check the confidential part of the SSP on board.**
- C. The Confidential part of a SSP can never be subject to non-flag State.
- D. Even the flag State has no right to check the SSP thoroughly.

注：根据文章第二段可看出，船长有权力拒绝PSC官员对船舶保安计划保密部分的检查，故选B。confidential机密的，保密的。

3. The Restricted parts of a SSP are kept on board by --- .

- A. the CSO
- B. the SSO**
- e. the Flag State
- D. themaster

注：根据文章第三段第5-6行可看出，船舶保安计划的保密部分由船舶保安员保管，故选B。

4. After the SSP being checked by a duly authorized officials of a port State, whom should be reported to by the ship immediately?

- A. Port State.
- B. Flag State.
- C. The CSO.**
- D. The Administration.

注：根据文章第二段第9-10行可看出，船舶保安计划被港口国正式授权的官员检查以后，船上要立刻报告公司保安员，故选C。

The Wartsila 50DF operates on the lean-burn principle: the mixture of air and gas in the cylinder has more air than is needed for complete combustion. Lean combustion reduces peak temperatures and therefore NO_x emissions. Efficiency is increased and higher output is reached while avoiding knocking. Combustion of the lean air-fuel mixture is initiated by injecting a small amount of LFO (pilot fuel) into the cylinder. The pilot fuel is ignited in a conventional diesel process, providing a high-energy ignition source for the main engine. To obtain the best efficiency and lowest emissions, every cylinder is individually controlled to ensure operation at the correct air-fuel ratio and with the correct amount and timing of pilot fuel injection. Wartsila has developed a special electronic control system to cope with the demanding task of controlling the combustion in each cylinder, and to ensure optimal performance in terms of efficiency and emissions under all conditions by keeping each cylinder within the operating window. Stable and well-controlled combustion also contributes to less mechanical and thermal load on the engine components. Current stringent emission regulations demand the reduction of NO_x emissions. In an internal combustion engine this means controlling peak temperature and residence time, which are the main parameters governing NO_x formations. In the Wartsila 50DF engine, the air-fuel ratio is very high (typically 20:1). Since the same specific heat quantity released by combustion is used to heat up a larger mass of air, the maximum temperature and consequently NO_x formation are lower. The mixture is uniform throughout the cylinder since the fuel and air are premixed before introduction into the cylinders, which helps to avoid local NO_x formation points within the cylinder. Benefiting from this unique feature, NO_x emissions from the Wartsila 50DF are extremely low and comply with the most stringent existing legislation.

1. What is the combustion feature of the Wartsila 50DF?

- A. Lean air in the cylinder. B. Excessive fuel in the cylinder.
C. Excessive air in the cylinder. D. Spark ignition.

注：根据文章第1-2行可看出，瓦锡兰50DF柴油机的燃烧特点是气缸里有过多的空气，故选C。

2. For the Wartsila 50DF, the complete combustion compared with the lean-combustion can decrease the following results . I. Exhaust temperatures II. NO_x emissions III. Propeller efficiency IV. Output V. Cylinder knocking VI. Fuel supply

- A. I + II B. III + VI C. IV D. IV + V

注：根据文章可看出，完全燃烧与稀燃相比会减少输出功率，故选C。

3. Which system should be supplied to obtain the best efficiency and lowest emissions?

- A. Lean combustion principle. B. Fuel oil system.
C. Electrical control system. D. Electronic control system.

注：根据文章第6-11行可看出，采用电子控制系统可获得最佳效率和最低排放，故选D。

4. What is the most advantage of the lean-combustion different from the routine combustion?

- A. Continue running.
B. Well combustion.
C. Higher peak temperature.
D. Lower holding time of Maximum temperature.

注：根据文章可看出，稀燃与正常燃烧相比的最大优点是降低最大温度的保持时间，故选D。

CCDD

Passage 77

International Convention for the Control and Management of Ships Ballast Water and Sediments was adopted by consensus at the International Maritime Organization (IMO) on February 13, 2004. The goal of the convention is to ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments.

Individual countries/parties may produce more stringent measures to prevent the introduction

of non-native species through ballast water and sediments, Under Regulation B-4, all ships using ballast water exchange should: whenever possible, conduct ballast water exchange at least 200 nautical miles from the nearest land and in water at least 200 meters in depth, taking into account Guidelines developed by IMO; Ships are required to have on board and implement a Ballast Water Management Plan approved by the Administration. The Ballast Water Management Plan is specific to each ship and includes a detailed description of the actions to be taken to implement the Ballast Water Management requirements and supplemental Ballast Water Management practices.

When these requirements cannot be met, areas may be designated where ships can conduct ballast water exchange. All ships shall remove and dispose of sediments from spaces designated to carry ballast water in accordance with the provisions of the ships' ballast water management plan.

1. What's the reason for the development of the Convention?

- A. Ships carry too much ballast water and sediments.
- B. Ballast water and sediments carried by ships are harmful for the personnel on board ships.
- C. Ballast water and sediments carried by ships are poisonous.

D. Non-indigenous species invasions might be caused by Ballast water and sediments.

注：根据文章第二段可看出，由于压载水和沉积物造成非本土物种的入侵是制定本公约的原因，故选D。indigenous本土的，species物种，invasion入侵。

2. What's the meaning of the word "stringent" in paragraph two?

- A. Rigorous.**
- B. Flexible.
- C. Genial.
- D. Reasonable.

注：在文章第二段中“stringent”和“rigorous”的意思一样，都是指严格的，故选A。

3. How do you deal with ballast water when your ship enters into other countries according to the passage?

- A. Conduct ballast water exchange as required by the International Convention.
- B. In accordance with the specific national or international requirements.**
- C. Exchange ballast water in designated areas.
- D. . . , Exchange ballast water more than 200 nautical miles from the nearest land.

注：根据文章第二、三段可看出，当船舶进入其他国家时，要按照国内和国际的特殊要求来处理压载水，故选B。

4. Which of the following is true according to the passage?

- A. The convention will come into force five years after the adoption.
- B. A contracting Party may adopt additional measures to control ballast water discharge.**
- C. Port" state officer has the right to approve Ballast Water Management plan.
- D. Sediments have to be removed from the tank when discharge ballast water.

注：根据文章第二段第1-2行可看出，缔约国可采取额外的措施来控制压载水的排放，故选B。

DABB

Passage 78

Almost all failures in the fuel oil system, including the compression being too low, result in the crankshaft rotating more slowly if there is a failure at one or more cylinders simultaneously. If only one or two cylinders fail, and the engine is not fully loaded, the crankshaft rev/min does not decrease, the reason being that the governor ensures that the remaining cylinders are loaded to a correspondingly greater extent. If the engine is already fully loaded, the cylinders that are working normally become overloaded causing a smoking exhaust and higher exhaust temperatures etc. The load must always be reduced until the failure has been located and rectified. The reasons for a cylinder suddenly working at reduced load, or failing completely, may be :

(1) a defective or blocked fuel injection valve.

(2) the fuel oil pump piston seizing in the barrel. This failure can be ascertained by trying to move the pump's toothed rack. Defective fuel pumps must be changed.

- (3) the compression being to low because of sticking , worn or broken piston rings.
- (4) leaking inlet or exhaust valves
- (5) no clearance in the valve operation gear.

The reasons for the crankshaft rotating more slowly, or stopping completely, can also be:

- (1) the fuel oil filter being blocked. This failure is identified by decreasing oil pressure after the fuel oil filter.
- (2) valve sticking in the open position
- (3) leaking fuel oil pipes or joints.
- (4) water in the fuel oil
- (5) the regulating mechanism being jammed
- (6) the governor not functioning correctly.
- (7) the electrical shutdown valve(the monitoring system)being activated.

1. This passage is mainly about _____.

- A. the failure of reduced rpm.
- B. the failure of the governor
- C. how to ensure the constant rotational speed
- D. the reasons for the fuel system to shut down

注：根据文章第一段的介绍和最后曲轴转速变慢原因分析，可以判断出本文章主要谈论的是转速下降的故障，故选 A。

2. If one or two cylinders fail in fuel oil system the crankshaft rev/min _____.

- 1) will inevitably decrease
 - 2) does not decrease
 - 3) will decrease under certain circumstances
- A. 1
 - B. 2
 - C. 3
 - D. None of 1 2 3 is true

注：根据文章第一段第二句可看出，在发动机满负载运行的情况下可以导致曲轴转速下降，答案中说在特定的条件下将下降与原文吻合，故选 C

3. Which of the following is NOT mentioned as the reason for a cylinder suddenly working at reduced load?

- A. fuel valve failure
- B. failure of fuel pump discharge valves
- C. too large gaps of piston rings
- D. the fuel oil filter being blocked completely

注：根据文章第二段关于气缸突然在低负载运行的原因分析可看出，， 阀件和活塞都有所提到，可是燃油滤器没有涉及到，故选 D。

4. Which of the following is NOT mentioned as the reason for the crankshaft rotating more slowly or stopping?

- A. changing from heavy oil to light diesel oil
- B. connections leaking
- C. there being too much water
- D. malfunction of the governor

注：根据文章最后一段关于曲轴转速下降或停车的原因分析可看出，管道泄漏、燃油中有水以及调速器的故障运行都有所涉及，可是关于重油到轻柴油的转换没有提到，故选 A。

ACDA

Passage 79

(1) The company should establish procedures to ensure that the ship is maintained in conformity with the provisions of the relevant rules and regulations and with any additional requirements which may be established by the company.

(2) In meeting these requirements the company should ensure that:

- (2.1) inspections are held at appropriate intervals
- (2.2) any non-conformity is reported, with its possible cause, if known;
- (2.3) appropriate corrective action is taken; and
- (2.4) records of these activities are maintained.

(3) The company should establish procedures in its safety management system to identify equipment and technical systems the sudden operational failure of which may result in hazardous situations. The safety management system should provide for specific measures aimed at promoting the reliability of arrangements and equipment or technical system that are not in continuous use.

1. This passage concerns _____.

- A. The inspections of the ship and equipment B. The reports of non-conformities
C. The corrective actions **D. The maintenance of the ship and equipment**

注：根据文章第一段第 1 句可看出，公司制定相关的程序为了船舶的保养维护符合相关的规则和条款，故选 D。

2. In(2.4) of this passage,"these activities" refers to the following activities except_____.

- A. The establishment of any additional requirement**
B. The corrective action taken
C. The inspections held
D. The reporting of any non-conformity

注：根据文章第二段第 3-5 行可看出，这些行为包括执行的检查、采取校正行为以及不符合项的上报，A 没有被包括，故选 A。

3. According to this passage, some particular equipment should have specific measures to promote its reliability, because_____.

- A. It is not in continuous use
B. Its sudden failure may result in hazardous situations
C. Its stand-by arrangements may not be regularly tested
D. It may not be identified by the company's safety management system

注：根据文章最后一段可看出，建立程序来维护安全管理系统，因为设备和系统的突发性失灵会产生险情的发生，故选 B。

4. This passage is probably taken from_____.

- A. The MARPOL convention B. The STCW convention
C. The ISPS code **D. The ISM code**

注：这篇文章介绍的公司建立程序为了设备和系统的安全保养维护，属于国际安全管理的内容，故选 B。像这样的题目主要是考学生对课文的话题熟悉度。

DABD