



CINEC Campus (Pvt) Ltd

Department of Marine Engineering

EDUCATION & TRAINING COURSE: PRE-SEA TRAINING COURSE FOR ENGINE RATINGS

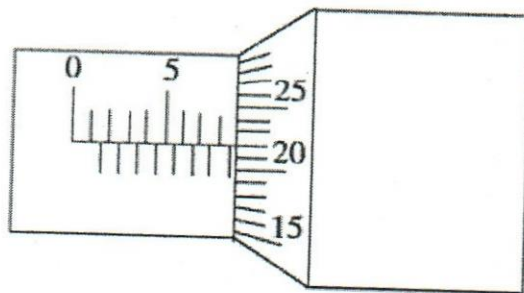
COURSE CODE: ED 273 P1 (23-03 & 23-04)

ENGINEERING KNOWLEDGE – II

- Answer **ALL FIVE** questions
- Date: 08/04/2024

Time allocated: **03 Hrs**Pass mark **50%**

- Write down 4 portable fire extinguishers & their color code (08 marks)
 - Write down 6 annexes of MARPOL (06 Marks)
 - State the long terms given below.
 - IMO
 - SOLAS
 - MLC
 - STCW
 - ISPS
 - SOPEP
- What are the types of marine steering gear? (02 marks)
 - List three components in the steering gear system. (03 marks)
 - Define purifier and clarifier. (04 marks)
 - Draw a basic refrigeration diagram and label all the parts. (06 marks)
 - Name three emergency situations that can happen onboard. (03 marks)
 - Name 2 types of valves used in the engine room. (02 marks)
- Name 4 basic measuring instruments used on board a ship. (04 marks)
 - Read the following micrometer readings. Scale is shown in mm (06 marks)



- What does "watch keeping" mean? (02 marks)
- List 4 logbook readings (02 marks)
- Explain the procedure of handing over a normal deep sea watch (06 marks)

4. a. Draw and label a plate-type freshwater generator. (10 marks)
b. What is the purpose of salinometer (03 marks)
c. List three checks to be done in a running freshwater generator when at sea. (03 marks)
d. Why are quick-closing valves fitted to fuel oil tanks? (02 marks)
e. Name 2 types of pumps used onboard. (02 marks)
5. A) Sketch a **2-stroke** engine timing diagram and name *Suction, compression, Combustion, power stroke, exhaust & scavenging* areas. (07 marks)
B) Draw & name marine **4-stroke** timing diagram (07 marks)
C) Draw and explain three scavenging methods used in marine diesel engines (06 marks)



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COURSE CODE: ED 273 P1 (23-03 & 23-04)

ENGINEERING KNOWLEDGE – I

- Answer **ALL** questions
- This paper consists of **33** questions and the marks will be awarded,

1st question – Four (04) marks

Other questions -Three (03) marks each

- Date: 08.04.2024

Time allocated: **01 Hour**

Pass mark 50%

-
- (1) What is the purpose of a volute casing in a centrifugal pump?
 - a) To convert pressure energy into kinetic energy
 - b) To convert potential energy into pressure energy
 - c) To convert kinetic energy into pressure energy
 - d) None of the above
 - (2) What is the risk of entering an enclosed space?
 - a) Low oxygen levels
 - b) Toxic gases
 - c) Poor lighting
 - d) All of the above
 - (3) What is the function of a fuel injector?
 - a) Supplies fuel to the piston
 - b) Sprays fuel into the combustion space of the cylinder
 - c) Supplies lubricating oil to the cylinder liner
 - d) Supplies lubricating oil to the gudgeon pin
 - (4) Which component is not part of a purifier?
 - a) Plunger
 - b) Sliding bowl
 - c) Bowl
 - d) Gravity disc

- (5) Why is tappet clearance necessary?
- For proper injection
 - For proper atomization
 - For thermal expansion of valves
 - For proper lubrication
- (6) What signal should be hoisted on the bridge during bunkering?
- Blue flag
 - White flag
 - No smoking sign
 - Red flag
- (7) What is the purpose of an Emergency Bilge suction valve?
- Is connected to the main sea water pump
 - Is connected to the bilge pump
 - Is connected to the sludge pump
 - Is connected to the fuel transfer pump
- (8) Which is not a purpose of the turning gear of a main engine?
- Turning gear is used to turn the main engine before starting up and after stopping.
 - It gives indication of the hydraulic locking before starting the engine.
 - Acts as a braking mechanism while stopping the engine
 - When an engine overhaul or inspection is carried out, the turning gear is used to turn the engine crankshaft into different positions.
- (9) What is not typically included in a muster list?
- Duties of each crew member in case of a fire
 - Location of muster station
 - Duties of each crew member in case of abandoning the ship
 - Lifeboat starting procedure
- (10) Which substance is considered an air pollutant?
- SOX
 - NOX
 - Volatile organic compounds
 - All of the above
- (11) which is not a part of CO₂ total flooding system?
- master valve
 - relief valve
 - mechanical seal
 - operating bottles

- (12) Turbo charger turbine side should be water washed at
- a) Low loads
 - b) Full loads
 - c) can do at any load
 - d) when engine is stooped
- (13) What is the purpose of boiler scum down valve?
- a) To take boiler water samples
 - b) To remove floating solids from the boiler
 - c) To fill the boiler
 - d) To release air from the boiler
- (14) Lubricating oils are used in an engine for
- a) Detergency
 - b) Dispersant
 - c) Reduce Friction
 - d) All of above
- (15) If the vessel is at port, you noticed no water level in the gauge glass, what is your first action,
- a) Supply water to the boiler
 - b) Close main steam stop valve
 - c) Stop burner
 - d) Increase air supply
- (16) Things not found in **SOPEP** locker,
- a) Saw dust
 - b) Fire axe
 - c) Absorbing pad
 - d) Shovel

- (17) On the expiry of the work permit during the work in an enclosed space,
- Everyone should leave the space
 - Inform to the chief engineer
 - Stay in the space until get new permit
 - None of above
- (18) What kind of pumps are fitted to the steering gear system
- Centrifugal pumps
 - Variable delivery pumps
 - Diaphragm pumps
 - Axial flow pumps
- (19) When you notice oil on the deck during bunkering, what is your first action?
- Inform duty engineer
 - Notify the terminal/barge
 - Stop bunkering and inform the engineer officer in charge of bunkering
 - Call the chief officer
- (20) What is the purpose of sign and notice,
- To make the place beautiful
 - Information and warning hazards
 - To decorate the wall
 - All of the above
- (21) The main cause for eye injuries
- | | | | |
|---|---------------------|-------------------|-----------------|
| a) Exposure to particle and
foreign bodies | b) Ultraviolet rays | c) Infra-red rays | d) All of above |
|---|---------------------|-------------------|-----------------|
- (22) Which of the following is a non-Metal?
- Iron
 - Ceramic
 - Brass
 - Bronze
- (23) Welding is,
- Is a method of joining metal by fusion
 - Is a method of joining metal by electric current
 - Is a method of joining metal by a filler rod
 - All of above

- (24) Priming of a pump is,
- Removing air from the pump
 - Removing water from the pump
 - Removing steam from the pump
 - All of the above
- (25) Which task is not related to marine boilers
- Supply steam to sea chest
 - Cabin heating
 - Running steam driven cargo pump
 - Maintain the scavenge air temperature
- (26) E.E.B.D use for
- Extinguished the fire
 - Entering to the enclosed space
 - Escaping areas of hazardous
 - All of above
- (27) What is the SI unit for energy?
- Joule (J)
 - Watt (W)
 - Ampere (A)
 - Kelvin (K)
- (28) In a large two stroke engine the bed plate, A frame and entablature are held together in compression by
- Tie bolts
 - Holding down bolts
 - Fitted bolts
 - External casing
- (29) Quick closing valves are not situated in
- Fresh water line
 - HFO lines
 - Lub oil lines
 - Diesel oil lines
- (30) Which valve can be used for flow regulation
- Butterfly valve
 - Cock valve
 - Gate valve
 - Quick closing valve

- (31) Cofferdam is a
- a) Tank between two tanks with different liquids
 - b) space between two engines
 - c) space between two adjacent decks
 - d) all above
- (32) Identify a safety device fitted to the main engine starting air system
- a) bursting disk
 - b) flame trap
 - c) relief valve
 - d) all above
- (33) What does Annex 4 of MARPOL cover?
- a) Prevention of pollution by oil
 - b) Prevention of pollution by noxious substances in bulk
 - c) Prevention of pollution by harmful substances in packaged form
 - d) Prevention of pollution by sewage

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CINEC Campus (Pvt) Ltd

Department of Marine Engineering

EDUCATION & TRAINING COURSE: PRE-SEA TRAINING COURSE FOR ENGINE RATINGS

COURSE CODE: ED 273 P1 (23-002)

ENGINEERING KNOWLEDGE – II

- Answer **ALL FIVE** questions

- Date: 02.03.2024

Pass mark 50%

Time allocated: 03 Hrs

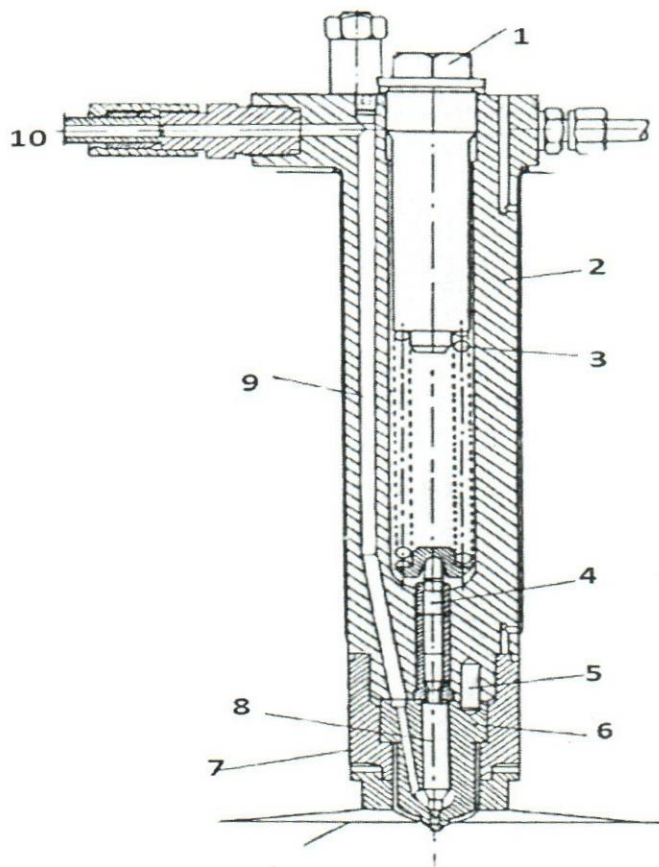
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- Draw a sketch of a 4 Stroke Engine Timing Diagram and name it. (6 marks)
 - What do you understand by Overlapping period? (2 marks)
 - State 3 types of scavenging methods. (3 marks)
 - Write down 3 differences between 4 Stroke diesel Engine and Marine 2 Stroke Engine. (3 marks)
 - Write down 2 Deck Equipments. (2 marks)
 - Write down 4 Boiler Mountings. (4 marks)

 - What type of main hazards can be in an Enclosed Space? State 3 of them. (3 marks)
 - State 2 type of Instruments used to measure an Enclosed Space atmosphere. (2 marks)
 - Briefly explain the procedures before enter the Enclosed Space. (5 marks)
 - Write down 4 types of Engine Room watches. (4 marks)
 - Briefly explain following terms.
 - Quick Closing Valve (2 marks)
 - Muster Station (2 marks)
 - Ventilation Flap (2 marks)

 - Draw a sketch of a Basic Refrigeration System and name it. (6 marks)
 - Briefly explain the functions of main components of a Refrigeration System. (4 marks)
 - Define Purifier and Clarifier. (2 marks)
 - What do you understand by priming a Pump? (2 marks)
 - Draw a sketch of a Gear pump and name it. (6 marks)

 - State all Marpol 73/78 Annexes. (6 marks)
 - Write down 4 types of Portable Fire Extinguishers with color code. (4 marks)
 - Write down 4 types of Personal Protective Equipments and their use. (4 marks)
 - Draw a sketch of a Vernier Caliper and name important parts. (6 marks)

5.



- a) Name all numbered parts of above sketch. (10 marks)
- b) Name the 2 types of Chucks commonly used for holding work piece in a Lathe Machine. (2 marks)
- c) State 2 types of Steering Gear Actuating systems. (2 marks)
- d) State 4 Emergencies, applicable for Ships. (4 marks)
- e) Write down 2 types of Alarms in the Engine Room. (2 marks)

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*Faculty of Marine Engineering
Department of Marine Engineering*

EDUCATION & TRAINING COURSE: PRE-SEA TRAINING COURSE FOR ENGINE RATINGS

COURSE CODE: ED 273 P1(BATCH 23-002)

ENGINEERING KNOWLEDGE – 1

- This paper consists of THIRTTY THREE questions, and the marks will be awarded,
1st question – Four (04) marks All other questions –Three (03) marks each.
- Answer ALL questions.

Date: 2nd Mar 2024

Pass mark 50%

Time allocated: 1Hrs

1. Plunger and Barrel are part of
 - a) Oily water Separator
 - b) Fuel Oil Injector
 - c) Sewage Treatment Plant
 - d) Fuel Injector Pump
2. Which is not an Internal Combustion Engine
 - a) 2 Stroke Marine Engine
 - b) 4 Stroke Petrol Engine
 - c) 4 Stroke Diesel Engine
 - d) Steam Turbine
3. Machinery Space Log Books are important, because
 - a) They serve evidence for proper running Machinery
 - b) They serve as evidence in case of an inquiry or Court case
 - c) They serve as history records for certain problem concerning Machinery
 - d) All of above

4. Purpose of Sign and Notice
 - a) To make the place beautiful
 - b) Information and warning hazards
 - c) To read when you are nothing to do
 - d) To decorate the wall
5. Steering Gear is the Equipment for
 - a) Turn the Ship during sailing
 - b) Move the Vessel Ahead or Astern
 - c) Start the Main Engine
 - d) Start the Fire Pump
6. Which is not a part of a Ship's Fire Main
 - a) Main Fire Pump
 - b) Emergency Fire Pump
 - c) Isolating Valve
 - d) Fire Axe
7. When there is no water in the Boiler
 - a) Stop the Burner
 - b) Supply water to the Boiler
 - c) Increase air supply
 - d) Close Main Steam Valve
8. What is the color code of a Dry Powder Extinguisher
 - a) Cream
 - b) Blue
 - c) Red
 - d) Black

9. Which is not a part of a Marine 2 Stroke Engine

- a) Cylinder
- b) Cross Head
- c) Stuffing Box
- d) Inlet Valve

10. Which is not a part of a Fuel injector

- a) Nozzle
- b) Needle Valve
- c) Compression Nut
- d) Rocker Arm

11. We can throw plastic

- a) 3 Nautical Miles away from the nearest land
- b) 12 Nautical Miles away from the nearest land
- c) 25 Nautical Miles away from the nearest land
- d) Cannot throw anywhere

12. Which one is not a part of a Centrifugal Pump

- a) Mechanical Seal
- b) Crank Shaft
- c) Volute Casing
- d) Wear Ring

13. In the Purifier Gravity Disc determines,

- a) The quality of separation
- b) Bowl RPM
- c) Sludge particle removal
- d) Motor Ampere

14. MLC 2006 means,
- a) Marine Local Council
 - b) Maritime Labour Convention 2006
 - c) Mechanical Labour Convention 2006
 - d) None of above
15. What should be the oil content in the water when discharge bilge water through Oil Monitoring Device
- a) 17 ppm
 - b) 20 ppm
 - c) Less than 15 ppm
 - d) More than 20 ppm
16. Which of the following is an Enclosed Space.
- a) Bridge
 - b) Galley
 - c) Cabin
 - d) Chain Locker
17. Operation of forcing additional air under pressure in the Engine is known as,
- a) Scavenging
 - b) Turbulence
 - c) Supercharging
 - d) Pre Ignition
18. Engine can be in Stand By Mode, when the Vessel in,
- a) Arrival/Departure Port
 - b) Restricted waters
 - c) Poor visibility
 - d) All of above

19. If Gas Cylinder leaks from outlet valve, cannot be stopped,
- a) Repair the valve
 - b) Fully open the valve to expel gas
 - c) Take to the open deck, away from heat or ignition source and slowly discharge to atmosphere
 - d) None of above
20. To extinguish cooking oil fire
- a) Apply water
 - b) Remove oil outside
 - c) Use Fire Blanket
 - d) None of above
21. Musters and Drills should be carried out,
- a) Regularly in accordance with Merchant Shipping Regulations
 - b) Realistically
 - c) As close as possible to emergency conditions
 - d) All of above
22. During Survival Craft Drill, before launch the Craft, Engine should not run for long time while testing the Engine, because
- a) We must shorten the time
 - b) Engine and Propeller Shaft Gland may overheated
 - c) To save the fuel economically
 - d) None of above
23. Hacksaw Blade cuts on the
- a) Forward Stroke
 - b) Return Stroke
 - c) Forward and Return Stroke
 - d) Direction of Force

24. Safety precaution to be observed against outbreak of Fire,

- a) Leaking Fuel oil or Lub.oil
- b) Exposed Exhaust Gas Manifold
- c) Exposed electrical wires
- d) All of above

25. DPA means,

- a) District Personal Assistant
- b) Designated Person Ashore
- c) Delivery Pump Accessories
- d) Divisional Public Assistant

26. Which is the following is suitable for Manufacture of Drill Bit

- a) Mild Steel
- b) High Carbon Steel
- c) Cast Iron
- d) Wrought Iron

27. Cofferdam is a

- a) Void space between two water tight Bulkheads
- b) Space between two Engines
- c) Space between two adjacent decks
- d) All of above

28. A/C Compressor,

- a) Compresses refrigerant gas
- b) Compresses refrigerant liquid
- c) Condenses refrigerant gas
- d) Evaporate refrigerant liquid

29. The Safety rules for handling Basic Tools,

- a) Inspect before use
 - b) Use right tools for the job.
 - c) Use proper Personal Protective Equipment
 - d) All of above
30. During Bunkering, Bridge should be hoist
- a) Blue Flag
 - b) White Flag
 - c) Red Flag
 - d) Yellow Flag
31. Which is not one of the Heat Treatment Process
- a) Tempering
 - b) Annealing
 - c) Hardening
 - d) Mouldings
32. Which is not a part of a Fuel oil Injector Pump
- a) Plunger
 - b) Barrel
 - c) Needle Valve
 - d) Delivery Valve
33. Which is the most suitable instrument to measure Cylinder Bore of an Engine
- a) Vernier caliper
 - b) Inside Micrometer
 - c) Steel Ruler
 - d) Pressure Gauge