



MEO CLASS 2

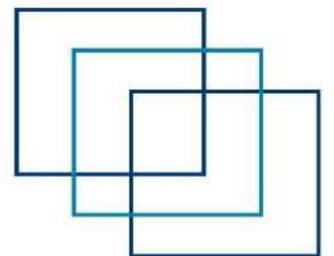
WRITTEN: EKM

(ENGINEERING KNOWLEDGE MOTOR)

FOR INDIAN COMPETENCY EXAM

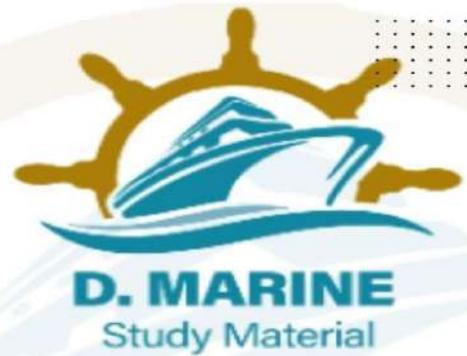


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JAN - 2026

1. With reference to Cylinder Liner lubrication of large two stroke engines.
 - a) Outline the problems associated with improper lubrication of the liner and piston assembly of a large slow speed engine
 - b) Describe and state the causes of cloverleafing, and micro-seizure
 - c) List out the composition of a cylinder oil suitable for an engine operating on residual fuel

2026/JAN/01

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2. With reference to bridge control of a large slow speed propulsion engine
 - a) How is starting and reversing achieved?
 - b) Investigate and suggest remedial action required if the engine fails to turn on air

Turns on air but fails to fire on fuel in fails to reverse

2022/JAN/06

2022/APR/03

2022/JUN/02

2023/MAR/08

2024/JUN/06

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3. With regards to modern 4-stroke diesel engine explain the following.
 - a) The function of protection ring installed on the upper part of liner.
 - b) The modification in fuel injection drive system compared to conventional 4 stroke engine.
 - c) Staggering of layout for multi hole nozzles.
 - d) Effect of swirl and squish during the combustion process and how swirl and squish is generated

2023/JAN/05

2025/JAN/02

2025/NOV/02

2026/JAN/01

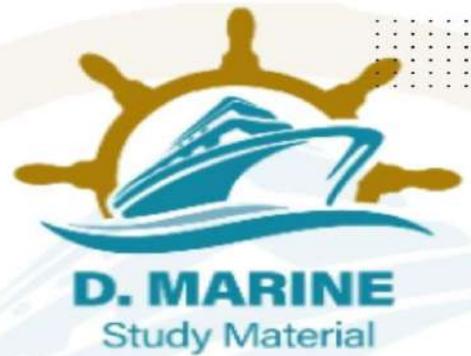
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4. Sketch and describe the arrangement of a main engine camshaft chain. Describe the repair procedure following fracture of one chain link during operation of the engine, give possible reasons for the failure and explain how the chain is set initially at the correct degree of tension.

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5. With reference to piston rings:

(a) State reasons for breakage

(b) How maintenance and engine operation could minimize breakage?

(c) Explain the possible Cori sequences with respect to performance and safety of piston rings. operating the engine with broken or severely worn pisti

2022/JAN/04 **2024/JUN/09**

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6.a) Explain how static and dynamic imbalance of crankshafts can be overcome. reciprocating balance in an engine and b) Discuss the methods employed to obtain ain primary, reci explain why they are not completely successful

c) Describe engine additions which may be fitted to overcome problems resulting from primary or secondary imbalance. (6)

2025/JAN/08 **2025/NOV/08** **2026/JAN/06**

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7.a) Cast iron welding is a challenging task, give reasons

(b) What alternative repair methods were employed by engine makers on a cast iron casing of an engine?

2026/JAN/07

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8.a) Sketch a sealing arrangement for an oil lubricated stem tube

(b) identify the common forms of seal failure.

(c) State how oil loss due to seal failure can be restricted whilst on Passage

(d) How the aft bearing is designed to minimize the concentrated load?

2022/AUG/02 **2025/SEP/02** **2026/JAN/08**

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9. With respect to respect to fuel injection system of diesel engines,

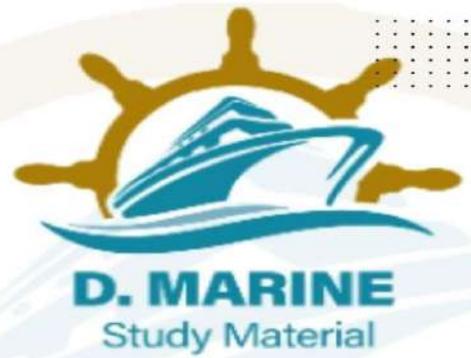
(a) What is the purpose of VIT?

(b) How is the end of injection controlled in a 2 stroke propulsion engine and 4 stroke medium speed auxiliary engine? (6)

(c) Explain the purpose of a draw card.



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2026/JAN/08

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FEB-2026

1. With reference to Cylinder Liner lubrication of large two stroke engines:(16)

a) Outline the problems associated with Improper lubrication of the liner and piston assembly of a large slow speed engine

b) Describe and state the causes of cloverleafing, and micro-seizure

c) List out the composition of a cylinder oil suitable for an engine operating on residual fuel. (16)

2026/JAN/01 **2026/FEB/01**

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2. With reference to bridge control of a large slow speed propulsion engine:

a) How is starting and reversing achieved?

b) Investigate and suggest remedial action required if the engine

i) Fails to turn on air

ii) Turns on air but fails to fire on fuel

iii) Fails to reverse

2023/MAR/08 **2024/JUN/06** **2026/JAN/02** **2026/FEB/02**

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3. With regards to modern 4-stroke diesel engine explain the following.

a) The function of protection ring installed on the upper part of liner. b) The moderation in fuel injection drive system compared to conventional 4-stroke engine.

c) Staggering of layout for multi hole nozzles.

d) Effect of swirl and squish during the combustion process and how swirl and squish is generated (16)

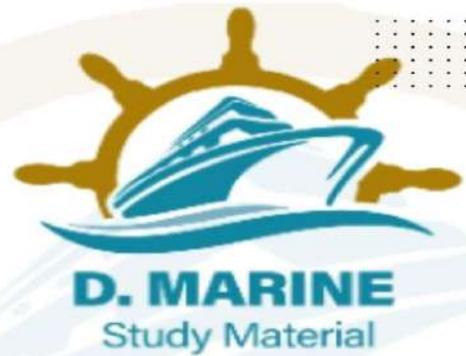
2023/JAN/05 **2025/JAN/02** **2025/NOV/02** **2026/JAN/03**

2026/FEB/03

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4. Sketch and describe the arrangement of a main engine camshaft chain. Describe the repair procedure following fracture of one chain link during operation of the engine, give possible reasons for the failure and explain how the chain is set initially at the correct degree of tension.

2023/JUL/01 **2023/DEC/09** **2025/SEP/08** **2026/JAN/04**
2026/FEB/04

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5. With reference to piston rings:

(a) State reasons for breakage. (16)

(b) How maintenance and engine operation could minimize breakage?

(c) Explain the possible consequences with respect to performance and safety of operating the engine with broken or severely worn piston rings.

2021/MAR/04 **2022/JAN/04** **2016/JUL/09** **2024/JUN/09**
2026/JAN/05 **2026/FEB/05**

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6.a) Explain how static and dynamic imbalance of crankshafts can be overcome.

b) Discuss the methods employed to obtain primary, reciprocating balance in an engine and explain why they are not completely successful. (5)

c) Describe engine additions which may be fitted to overcome problems resulting from primary or secondary imbalance. (6)

2025/JAN/08 **2025/NOV/08** **2026/JAN/06** **2026/FEB/06**

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7. (a) Cast Iron welding is a challenging task, give reasons.

(b) What alternative repair methods were employed by engine makers on a cast iron casing of an engine? (8)

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8. (a) Sketch a sealing arrangement for an oil lubricated stern tube.

(b) Identify the common forms of seal failure.

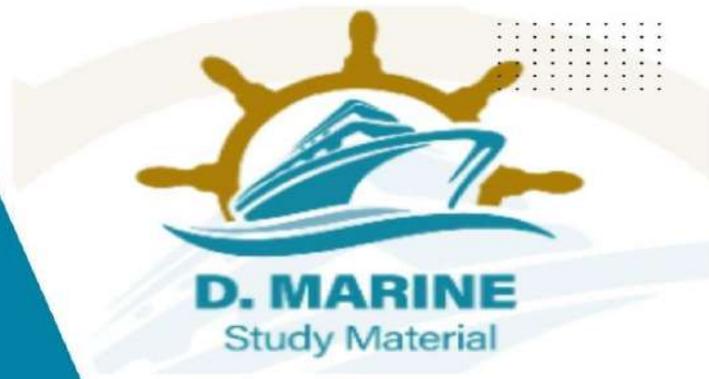
(c) State how oil loss due to seal failure can be restricted whilst on Passage.

(d) How the aft bearing is designed to minimize the concentrated load?

2022/AUG/02 **2025/SEP/02** **2026/JAN/08** **2026/FEB/08**



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9. a) Sketch and explain a fuel injection pump capable of variable injection timing. (10)

b) Explain how the fuel injection pump sketched in part

a) changes the timing and quantity of fuel injection.

2021/APR/07

2021/AUG/06

2022/FEB/06

2022/SEP/02

2023/JAN/09

2023/AUG/01

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