

## **ME 502 MARINE INTERNAL COMBUSTION ENGINE 1.. QUESTION BANK questions**

### **Section A**

#### **Unit 1**

- 1) Describe Otto cycle.
- 2) Describe Diesel cycle.
- 3) What are “ blow down “ and “ over lap period “.
- 4) What is the RPM of a slow speed Engine.
- 5) What do you understand by PV diagram.

#### **Unit 2**

- 1) Name few mountings on a 4 stroke Engine cylinder head.
- 2) What is the purpose of tell-tail hole in an entablature of an Engine.
- 3) Why are chocks needed and what are end and side chocks?
- 4) What are engine frames?
- 5) What functions do engine frames serve?
- 6) For what purpose Tie- bolts are used?
- 7) What is the function of a cylinder cover?

#### **Unit 3**

- 1) What is a Supercharged Engine?
- 2) What is the purpose of Supercharging?
- 3) What are the methods adapted to supply scavenge air while maneuvering a two stroke engine?
- 4) What are the advantages of turbo charging?
- 5) What are the two important effects of charge air-cooling?
- 6) Why excessive cooling of air should be avoided?

#### **Unit 4**

- 1) What is a pre combustion Chamber?
- 2) Explain Effects of after burning.
- 3) Explain The function of a fuel injector.
- 4) What do you mean by SFC- specific fuel consumption
- 5) What do you mean by SLOC- specific lub. Oil consumption.

#### **Unit 5**

- 1) Why under piston space scavenge drain is provided.
- 2) What is the use of stuffing box lube oil drain tank?
- 3) How are the stuffing box ring segments held?
- 4) What do you mean by Primary explosion of an Engine crankcase .
- 5) What do you mean by Secondary explosion of an Engine crankcase.

## **Section B**

### **UNIT-1**

- 1) Classify IC engines according to a) Speed b) Bore/ stroke ratio.
- 2) Explain briefly a) Spark ignition engine b) Compression ignition engine.
- 3) Draw the PV diagram of a four stroke engine & explain.
- 4) Draw the PV diagram of a two stroke engine & explain.
- 5) Name the a) Advantages b) Disadvantages of a cross head engine over trunk type.

### **UNIT-2**

- 1) Name the forces applied to a bedplate?
- 2) State the following: a) Clearances to be recorded for piston rings b) Forces acting on it?
- 3) State what all methods the gudgeon pin is attached to piston.
- 4) What are the major stresses developed in the crankshaft.
- 5) Mention the normal defects found in cylinder heads.
- 6) Explain the purpose of the tie bolts.
- 7) With respect to cylinder liner state a) Causes of excessive liner wear b) Types of wear.
- 8) Explain the a) Factors affecting the degree and type of scaling b) The effect of scale deposition in a cooling water circuit.

### **UNIT-3**

- 1) Explain the term super charging and turbocharging.
- 2) What is the effect of inefficient scavenging?
- 3) Why charge air is cooled and what are the benefits on engine performance?
- 4) Explain various methods of scavenging in a two stroke engine.
- 5) Explain 1) Under piston scavenging. 2) Pump Scavenging.

### **UNIT- 4**

- 1) Show how the chemical reaction of fuel takes place with oxygen during proper combustion & quantity of heat liberated.
- 2) Explain the term a) Compression Pressure b) Peak pressure.
- 3) Explain the term a) Injection delay b) Ignition delay

- 4) With reference to combustion what is a) atomization b) penetration?

## **UNIT-5**

- 1) What are the safety devices provided to minimize damage due to crankcase explosion?
- 2) What are the indications of Scavenge fire?
- 3) What are different modes of firefighting arrangements provided on board to fight scavenge fire?
- 4) Describe the means of protection against EACH of the following engine faults in a vessel operating with UMS:
  - (a) Crankcase explosion.
  - (b) Scavenge fire.

## **Section C**

### **UNIT-1**

- 1) Compare slow speed, medium speed and high speed engine
- 2) Draw four stroke engine working principle and explain the cycle.
- 3) Draw two stroke engine working principle and explain the cycle.
- 4) Draw valve timing diagram of a four stroke engine and explain the cycle.
- 5) Draw valve timing diagram of a two stroke engine and explain the cycle.
- 6) Sketch two most common types of bedplates and name the engine makers who use them.

### **UNIT-2**

- 1) List out the difference between crosshead and trunk type engine with diagram?
- 2) With simple sketch discuss what is a) Butt clearance b) Axial clearance c) Back clearance in piston rings. What are the effects of clearances being less or excessive.
- 3) What are the main causes of liner wear? Explain the term a) Clove Leafing b) Scuffing wear.
- 4) Sketch and describe hydraulically operated exhaust valve with air spring arrangement.
- 5) With reference to four stroke engine Cylinder head valves explain what is a) valve floating, b) bouncing c) how can it be reduced d) What is tappet clearance?
- 6) Sketch a tie bolt in position in a large crosshead engine, define the purpose of fitting tie

Bolt. What are the effects of running with loose tie bolts?

- 7) Sketch and describe main engine piston with short skirt & name the parts. Show the Direction of coolant. Discuss how it is ensured the crown receives an adequate supply of coolant.
- 8) Explain the advantages and disadvantages of using water and oil for piston cooling medium.

### **Unit 3**

- 1) With neat sketch explain different type of Scavenging.
- 2) Explain the advantage and disadvantage of different scavenging system.
- 3) With reference to turbocharger, what is surging & its causes.
- 4) With respect to turbocharging sketch and describe what is a) Pulse system b) constant pressure system?
- 5) Give the merits and demerits of pulse and constant pressure turbocharging system.
- 6) Sketch and describe a turbocharger suitable for a diesel engine.

### **Unit-4**

- 1) Draw the power and draw card and explain the effect of after burning.
- 2) Draw the power and draw card and explain the effect of late injection.
- 3) What liquid fuel (Heavy Oil) consists of & show the chemical reaction with Oxygen during combustion & quantity of heat liberated.

### **UNIT-5**

- 1) What is scavenge fire and what are the causes of scavenge fire. How can it be prevented.
- 2) Describe the actions to be taken in case of scavenge fire.
- 3) Sketch and explain the working of a crank case oil mist detector.
- 4) Discuss how crankcase explosion takes place. Sketch the crank case relief door of a large main engine & name the parts.
- 5) Sketch & Describe a piston rod stuffing box incorporated in a two stroke crosshead diesel engine which serves to prevent sludge and dirty oil from entering the crankcase.