

**INDIAN MARITIME UNIVERSITY**  
**(A Central University, Government of India)**

**B.Tech. (Marine Engineering)**  
**Semester –VI – December 2015 End Semester Examinations**

**Marine Internal Combustion Engine - II**  
**Subject Code: UG11T1602**

Time: 3 Hours  
Date: 11.12.2015

Max Marks: 100  
Pass Marks: 50

**PART-A**

**(3x10 = 30 Marks)**

**Compulsory Questions**

1.
  - a) Explain 'ignition delay' in the combustion process in a diesel engine.
  - b) What is 'Compensation action' in Governors used on marine engines.
  - c) Explain 'boundary lubrication' with at least two examples.
  - d) Briefly explain the 4-Stroke engine cycle with the help of a diagram.
  - e) What causes microbial contamination of oils. How is it removed?
  - f) What are the differences in the properties of crankcase oil and cylinder oil of a large bore engine.
  - g) Define i) ignition point ii) fire point, iii) flash point (closed/open)
  - h) What stresses are a crankshaft subject to, and why?
  - i) How will you detect fuel dilution in an engine?
  - j) What is the purpose of having 'tappet clearance' in a 4-stroke diesel engine?

**PART - B**

**( 5x14 = 70 Marks)**

**Answer any five of the followings**

2. State what 'good operational practices' you will follow in the upkeep of lub oils and lubrication of marine machinery, while on board a ship.
  - a) List five important properties of lubricating oils used in the Engine Room.
  - b) What properties are desired of a cylinder oil used for a large bore engine? (10+2+2)
3. What are the contaminants found in the crank case oils of engines?
  - a) How is their presence detected?
  - b) What damage does presence of water cause? (6+4+4)
4. What are: i) Isochronous, ii) Variable speed - Governors ? Where are they specifically used?  
Sketch and describe a mechanical-hydraulic Governor, with a servo power amplifier. (4+10)
5. How are trunk type pistons cooled? Explain with examples and sketches.
  - a) why must the boss and strut regions not exceed 200degree C during operation ?
  - b) What provision is made to protect wear of grooves in Al-alloy pistons? (8+3+3)
6. What material are cylinder liners made of and why?
  - a) Explain how cylinder liners are calibrated, giving a list of precautions taken.
  - b) What is bore cooling of liners? What benefits does it provide? (4+6+4)

7. Sketch and describe an air starting line for a propulsion engine, showing all safety items.
- a) What causes explosions in such pipelines and how will you prevent such occurrence?
  - b) How is a leaking starting valve on a cylinder head identified? (6+4+4)
8. What are the stresses an exhaust valve of an engine subject to, and describe the types of failure they suffer as a consequence.
- a) What material are the modern valves made of?
  - b) what design improvements have been made to enhance longevity and TBO. (6+4+4)

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