

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

**May/June 2015 End Semester Examinations**

**SEMESTER – VI, B.TECH ( MARINE ENGINEERING)**

**MARINE INTERNAL COMBUSTION ENGINE – II (T 1602)**

**Date: 10.06.2015**

**Max. Marks: 100**

**Time: -3 Hrs**

**Pass Marks: 50**

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**PART – A**  
(Compulsory Questions)

**(3 x 10 = 30 Marks)**

1. a) State the causes of wear in cylinder liners.
- b) What is hydrodynamic lubrication ? Give two examples
- c) What is 'critical speed' of an engine and state the consequences of prolonged running at this speed.
- d) What is a 'fail safe' governor, and why is such a feature necessary?
- e) What is ignition delay in fuels?
- f) What is surging in turbochargers, and what are the several causes?
- g) Define: Flash Point, Ignition point, Fire point, pour point, cloud point.
- h) What properties are desired of cylinder oil for a large bore engine. What does the '70' mean in BN-70 ?
- i) What is a 'flexible coupling'? What advantages does it have over a rigid coupling, & where used?
- j) What are the causes of a major scavenge fire in a propulsion engine?

**PART – B**  
(Answer any five of the following)

**(5 x 14 = 70 Marks)**

2. Explain how cylinder liner wear of a Marine Diesel Engine is calibrated, along with the precautionary measures taken. State what inferences are derived from the results of such calibration.
  - a) What are the purposes of cylinder liner lubrication?
  - b) Why are ribs provided on the external surface of such liners? **(10+2+2=14)**
3. Sketch and describe a lubricating oil line of a large propulsion engine giving the salient temperatures and pressures at different stages. **(10+4= 14)**
  - a) How and why, is a continuous cleaning process for the oil necessary?

4. Predictive maintenance is a key feature in Condition Monitoring techniques of marine machinery. Explain why, giving its advantages over routine maintenance.
  - a) State why auxiliary engines are not included in computerised condition monitoring procedures, and what alternative measures apply to them. **(10+4= 14)**
  
5. Sketch and describe an Air Starting line system of a marine propulsion engine.
  - a) What are the safety features incorporated in the lines?
  - b) What causes explosions in such pipelines?
  - c) How can you identify a leaking starting air valve on the cylinder head, of a running engine?

**(8+2+2+2= 14)**
  
6. Sketch and describe a mechanical -hydraulic governor used on diesel engines.
  - a) Distinguish between: an 'isochronous' and 'variable speed governor". **(10+4 = 14)**
  
7. Explain the “camless concept” for marine diesel engines. What advantages and disadvantages does it have over the normal camshaft driven engines. **(14)**
  
8. Describe a V-type diesel engine used for marine purposes. Giving its advantages and disadvantages over the 'in-line' engines. **( 8+3+3=14)**
  - a) How are two connecting rods fitted on a single crank pin of the crankshaft?
  - b) Why starting air valves are installed on only one bank of cylinders?
  
9. What are the stresses an exhaust valve of an engine is subject to, and describe the types of failure they suffer as a consequence.
  - a) What are the constituent materials that modern exhaust valves are made of in diesel engines?
  - b) What design improvements are incorporated to enhance TBO and longevity of such valves?

**( 8+3+3= 14)**

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