

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)  
May/ June 2017 End Semester Examinations  
B. Tech (Marine Engineering – Fifth Semester)

**Marine Boilers & Steam Engineering – UG11T 2402/UG11T 1402**

Date: 13.06.2017

Maximum Marks : 100

Time: 3 Hrs

Pass Marks : 50

---

**PART – A**

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

**(All Questions are compulsory)**

1. a) With the help of a neat sketch explain how smoke tubes are attached to tube sheet.
- b) List the functions of steam drum for a water tube boiler.
- c) Write a short note on water wall tubes.
- d) List out the primary functions of a condensing plant for a turbine and explain the reasons for maintaining high condenser vacuum.
- e) Smoke tube boilers are usually employed for low pressure applications. Explain the reasons for this limitation.
- f) Draw a neat sketch and explain the function of a "bridge gauge".
- g) List out the various causes for failure of refractory.
- h) Write a short note on LP steam turbine blade material selection criteria and typical blade material.
- i) Draw a neat sketch of a spring backed labyrinth glands.
- j) List down any five Non- Destructive tests carried out on boiler plates.

**PART – B**

**(5 x14 = 70 marks)**

**(Answer any 5 of the following)**

2. (a) Explain the working of a double evaporation boiler with a neat sketch.  
(10 marks)
- (b) List out seven important boiler mountings and explain the function of air vents.  
(4 marks)

3. (a) Draw a sectional view of an ordinary plate type water level indicator and label the parts. (7 marks)
- (b) Sketch and explain the working of retractable soot blower. (7 marks)
- 4.(a) Explain the process of residual fuel oil burning in a furnace starting from atomisation to complete combustion. (7 marks)
- (b) Explain the turbine supporting arrangement and the function of sliding foot and panting plate. (7 marks)
- 5.(a) Write a short note on Hydraulic test of boilers. (7 marks)
- (b) Write a short note on Boiler tube failure including detection and rectification. (7 marks)
- 6.(a) List out various gear defects and explain Scuffing defect. (5 marks)
- (b) Sketch and describe a "three element feed water controller". (9 marks)
- 7.(a) Draw a typical single plane turbine plant with HP and LP turbine suitable for marine steam propulsion plant. Indicate the cross over pipe, astern turbine, condenser and the gear box. (7 marks)
- (b) List out the various internal losses in turbine and describe "Residual velocity loss" and "Gland leakage losses". (7 marks)
8. (a) List out various causes of loss or low vacuum in condenser. (4 marks)
- (b) Draw a typical impulse turbine blade indicating the "inverted T" root fixing arrangement, tenon and shroud band. (5 marks)
- (c) List out routine checks to be carried out and care to be taken to ensure proper lubrication of turbine bearings. (5 marks)

\*\*\*\*\*