

INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

END SEMESTER EXAMINATION DECEMBER 2017

Programme: B.Tech (Marine Engineering)

Semester: IV

Subject Name: Marine Boiler & Steam Engg

Subject Code:

UG11T2402/ UG11T1402

Date: 21.12.2017

Maximum Marks: 100

Time: 3 HRS

Pass Marks: 50

PART – A

Marks: 3X10=30

(All Questions are compulsory)

- 1)
 - a) Enumerate 5 non-destructive tests carried out on boiler plates.
 - b) What is the advantage of compounding reciprocating steam engines?
 - c) Describe the function of an Economiser in a marine steam plant.
 - d) What is gland steam in a steam turbine?
 - e) State the reason for having 2 safety valves on a boiler, and procedure to operate it manually
 - f) With a simple sketch explain the function of a labyrinth seal on a steam turbine.
 - g) What are the properties of material used for steam turbine rotors?
 - h) How can a hole in the smoke tube of a boiler be repaired temporarily?
 - i) What alarms and safety trips are provided in a steam turbine lubricating oil system starting from oil reservoir?
 - j) Explain where & why a steam "Header" is fitted?

PART – B

Marks:5X14=70

(Answer any 5 of the following)

- 2) a) Explain with aid of suitable graphs the pressure and velocity curves of steam impulse and steam reaction turbines. (08 Marks)
- b) Explain briefly steam impulse and reaction turbines. Compare the advantages and disadvantages of steam impulse and steam reaction turbines (06 Marks)
- 3) a) Describe a Boiler control system showing equipments/components in the system for ensuring optimum combustion of fuel. (10 Marks)
- b) How is varying steam demand controlled by this system? (04 Marks)
- 4) a) Draw a simple layout of a steam turbine plant with all auxiliaries and L.O. system labelling all installations in the plant neatly. (08 Marks)
- b) What is the use of a vacuum condenser in a steam plant? How the vacuum is maintained in the vacuum condenser? (06 Marks)
- 5) a) How are stay tubes attached in a smoke tube boiler? (05 Marks)
- b) Why blowing down of boiler is required (05 Marks)
- c) What is function of a soot blower (04 Marks)
- 6) a) Why reduction gears are used with a ship propulsion steam turbine plant? (04 Marks)
- b) Describe flexible coupling. What is its use in a steam turbine? (04 Marks)
- c) What is a quill shaft? Draw a simple diagram and explain its use in a double reduction gear system. (06 Marks)
- 7) a) Sketch and describe a "Three Element Feed Water Controller". (10 Marks)
- b) What actions are taken to control high Chloride content and low pH value of Feed water. (04 Marks)
- 8) a) Explain the need of and procedure for warming up a steam turbine plant. (08 Marks)
- b) What is the shutting down procedure for a steam turbine propulsion plant after finished with engine? (06 Marks)
