

**INDIAN MARITIME UNIVERSITY**  
(A CENTRAL UNIVERSITY, GOVT. OF INDIA)  
**END Semester EXAMINATIONS DEC 2017**  
SEMESTER- VI, B.TECH. (MARINE ENGINEERING)  
ADVANCED MARINE HEAT ENGINES (UG11E 1602/E2602)

**Date:** 03.01.2018  
**Time:-**3 Hrs

**Max.Marks:**100  
**Pass Marks:** 50

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**PART – A**  
**(Compulsory Questions)**

**(3 x10 = 30 Marks)**

1. a) Explain: Free Piston Gas Generator.
- b) Explain: cascade refrigeration plant
- c) What is the function of a compressor?
- d) Define atomization and combustion chamber.
- e) Why and where is air pre-heaters used?
- f) Why steam propulsion is preferred on LNG ship?
- g) What is the purpose of Gas and Oil heaters?
- h) Mention different types of heat exchangers?
- i) How LNG boil off gas is cooled?
- j) What is the function of a heat exchanger?

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

**(5 x14 = 70 Marks)**

- 2 a) Sketch & describe combined steam turbine & diesel engine cycles. (7)
- b) Briefly describe how the overall thermal efficiency of a plant can improved (7)

3. a) What are the ideal conditions for efficient burning of fuel in a diesel engine?  
b) How the shape of combustion space effects combustion  
c) Briefly explain methods of reducing NOx (5+4+5)
- 4 a) what are the different types of heat exchangers and explain?  
b) How the overall heat transfer coefficient and fouling factor can be determined?  
(7+7)
- 5 a) How does a cascade refrigeration plant work?  
b) Sketch and describe such a plant.  
(7+7)
- 6 a) with a suitable sketch describe how efficiently waste heat is recovered  
From a marine diesel engine plant.  
b) How LNG boil off gas is cooled?  
(12+2)
- 7 For axial flow impulse-reaction gas turbine, derive an expression for load coefficient with  
flow coefficient. Find the same for 50% reaction turbine.  
(14)
- 8 a) Sketch and describe operation of a free piston gas generator.  
b) What is the thermal efficiency of such a generator?  
(12+2)

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