

# Indian Maritime University

( A Central University, Govt of India)

May-June 2018 End Semester Examinations

## B. Tech (Marine Engineering)

Semester-VI

### ADVANCED MARINE HEAT ENGINE (Co-Cycles) (UG11E2602/1602)

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Date: 20.06.2018

Max Marks:100 Marks

Time: 3 Hrs

Pass Marks: 50 Marks

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#### Part A (3 X 10 = 30 Marks ) Compulsory Questions

1. a) What are the basic components of a combined cycle plant ?
- b) Why premixing of gaseous fuel is required for combustion ?
- c) What is flame stabilization and why is it required ?
- d) Explain the basic function of a turbine.
- e) What are the main components of a steam turbine plant ?
- f) What are the drawbacks of a Diesel engine ?
- g) Which one is better among liquid, solid and gas fuels -justify ?.
- h) What is the purpose of air preheaters and where are they used ?
- i) Define penetration of fuel and combustion chamber. ?
- j) Why does stalling of compressor occur ?

#### Part B (5X14=70 Marks ) Answer any **five** of the followings.

2. a) How can you classify different Heat Exchangers ?
- b) Establish a relationship between heat transfer coefficient and Fouling Factor.
- c) Obtain a relationship between LMTD and overall heat transfer Coefficient for a parallel flow heat exchanger. ( 4 + 3 +7 )
3. a) Explain the working principle of a centrifugal Compressor.
- b) Establish an expression for the work done by impeller in a Centrifugal Compressor. ( 6+8 )
4. a) Narrate the principle of a Axial Flow Compressor.)

- b) With the help of a diagram of delivery pressure vs mass flow explain the phenomenon of choking and surging in a compressor. **( 7 + 7 )**
5. a) What is Coal Gasification and show its location in a combined cycle plant .  
b) How can you determine approximate thermal efficiencies of different components of a combined cycle plant. **( 7 + 7 )**
6. a) Discuss about the mechanism of fuel oil combustion.  
b) How can the spray of fuel be performed ?  
c) Explain the methods of fuel atomization **( 5+4+5)**
7. a) What is Cascade refrigeration plant?  
b) Sketch and discuss free piston Gas Generator. **( 7+7)**
8. Write short notes on any two of the followings :
- a) Roots Blower b) Axial vs Centrifugal Compressor c) advantages and disadvantages of combined cycle power plant d) Working principle of Shell and tube Heat exchanger. **( 7 x 2 )**

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