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### Fifth Semester B.E. Degree Examination, Dec.2015/Jan.2016

### Marine Auxiliary Machines – II

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.**

#### PART – A

- 1 a. State the bilge discharge regulations as per MARPOL Annex – I for cargo ships. (08 Marks)  
b. Draw the bilge line diagram stating all values. (08 Marks)  
c. With a neat sketch explain the purpose of emergency bilge injection. (04 Marks)
- 2 a. Explain the bunkering procedures and precaution to be taken during bunkering. (12 Marks)  
b. Sketch and describe the fuel out transfer system of a cargo ship. (08 Marks)
- 3 a. Write a short notes on following types of marine application pumps :  
i) Reciprocating pump ii) Centrifugal pump iii) Diaphragm pump. (12 Marks)  
b. Explain net positive suction head and its importance. (04 Marks)  
c. Explain cavitations. How to avoid it? (04 Marks)
- 4 a. Explain the working of a onboard 2 – stage air compressor? Explain bumping clearance and its importance. (10 Marks)  
b. Describe with a neat sketch the process of water production by low pressure evaporation onboard ship. (10 Marks)

#### PART – B

- 5 a. Sketch and describe shell and tube type heat exchanger and explain the procedure of pressure testing of heat exchanger and plugging of tubes. (12 Marks)  
b. Sketch and describe a bilge water separator (OWS) used on board ship. (08 Marks)
- 6 a. Explain the theory of oil purification. Describe with a neat sketch working of heavy fuel oil purifier. (12 Marks)  
b. Explain the following on board lubricating oil tests :  
i) Alkalinity  
ii) Viscosity  
iii) Crackle test for water in oil  
iv) Dispersiveness and contamination. (08 Marks)
- 7 a. Sketch and explain the four ram type steering gear used in Marine application. (12 Marks)  
b. Explain with neat sketches the following steering gear pumps :  
i) Radial piston (Hele – show pump)  
ii) Final piston (Swash plat control pump). (08 Marks)
- 8 a. Explain with a neat sketch working of an aerobic sewage treatment plant (Hanworthy type). (10 Marks)  
b. Explain with a neat sketch working of an onboard incinerator. (10 Marks)