INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

May/June 2016 End Semester Examinations
B.Sc. (Nautical Science) - Fifth Semester (2013 batch onwards)

Marine Engineering Automation & Control Systems-V (T 2506)

Date : 11.07.2016 **Maximum Marks: 70**
Time: 3 Hrs **Pass Marks : 35**

Note: Attempt any 7 questions out of 9 questions. All questions carry equal marks.
Attempt at least **one question from each section**
Use of Non Programmable calculator is permitted.
All sections are to be tied together.

SECTION – A
Main Propulsion Units (IC Engines & Others)

1. The area of an indicator diagram taken of one cylinder of a four cylinder, four stroke, internal combustion engine is 384 mm^2, the length is 72mm. and the indicator spring scale is 1 mm = 2.0 bar. The diameter of the cylinders is 260 mm, stroke 310 mm. and rotational speed 300 rev/min. Calculate the indicated power of the engine assuming all cylinders develop equal power. (10)

2. (a) Write down different types of turbine and explain any one type with suitable Sketch. (5)
   (b) A ship travels 900 nautical miles at a speed of 12.5 knots and burns 150 Ton of fuel over the voyage. Estimate the distance the ship could travel at a speed of 13.5 knots on 250 Ton of fuel. (5)

3. Explain the Bridge control of "CPP – Diesel Engine" System with a suitable Sketch and write down precautions with regard to CPP for

   a) Before starting main engine
   b) Before going to sea
   c) Before entering harbour or confined water (10)

SECTION – B
Liquified Gas Tankers

4. a) Draws and Label the pipeline of a Gas Carrier (5)
   b) Explain the functioning of Cargo heater on a Gas Carrier (5)

P.T.O.

5. a) List the locations of Gas measuring sensors fitted on a Gas Carrier (4)
   b) Explain the difference between the Cargo Calculation on a Tanker and on a Gas Carrier. (6)

6. With the aid of a diagram explain the operation of deep well pumps and the precautions to be taken prior starting the pump (10)

SECTION - C
Automation and Control Engineering

7. Define the following:
   i) Actuator (ii) Closed loop control (10)

8. Describe the principle and working of a Pneumatic, Integral, Derivative Controller (10)

SECTION – D
Safety Arrangements

9. a) With the aid of a diagram explain the functioning of catalytic filament Combustible Gas Indicator (8)
   b) Name the types of sensors used in oxygen analyser (2)

10. a) List down the part of inert gas system and explain the functions of each part (5)
    b) Explain the operation of Multi gas toxic gas detector using chemical coated tubes. (5)

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