

Total number of printed pages – 4 **B. Tech**
CPMR 8406

Eighth Semester Examination – 2008

MARINE CONTROL ENGINEERING AND AUTOMATION

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory
and any **five** from the rest.*

*The figures in the right-hand margin
indicate marks.*



1. Answer the following questions : 2 × 10
- (a) Write the meaning of droop in control system.
 - (b) Differentiate between integral and derivative control.
 - (c) Why salinity indicator and pH meter is used in boiler water feed tank ?

- (d) What do you mean by Nyquist stability criterion ?
 - (e) Write the meaning of photo conductive cell.
 - (f) Explain two element type boiler feed water control system in block diagram.
 - (g) Show the digital tachometer in block diagram.
 - (h) Why swell and shrinkage allowance is provided in boiler ?
 - (i) Differentiate between single ported and double ported valve.
 - (j) Explain the principle of Pneumercator.
2. (a) Explain the marine boiler automatic combustion control system for high pressure boiler. 8
- (b) How the float gauge works in boiler feed water tank ? 2
3. (a) How bridge control of main propulsion machinery is carried in UMS class ship ? 8

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- (b) How you will control the movement of ship if bridge control fails ? 2
4. (a) Explain the practical application of nozzle / flapper mechanism in control system. 5
- (b) Derive the conditions for the equation $\Delta (s) = S^4 + 5S^3 + 20S^2 + 40S + 50$ by taking Routh-Hurwitz stability criteria. 5
5. (a) Draw a valve positioner showing each components and explain how it is used in controlling v/v. 5
- (b) In control system explain the following parameters : 5
- (i) Desired valve
- (ii) Set value
- (iii) Dead time.
6. (a) Explain the principle of graviner oil mist detector used for sulzer engine. 5
- (b) Explain with sketch the principle of oil in water monitor used in E/R bilge system. 5

7. (a) Show the main engine piston cooling water control system in block diagram. 5
- (b) Explain the different types of level gauges used for maintaining tank levels on a oil tanker. 5
8. (a) Explain open loop and closed loop feed back system with block diagram. 5
- (b) What are the different system response and how they are used in control system ? 5