

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – December 2023**  
**Programme Name: B Tech (ME)**  
**Semester: IV**  
**Subject Code: UG11T3407**  
**Subject Name: Applied Marine Control and Automation**

Date: 30.11.2023

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Options, if any, are specified in respective section.

Section A

**All questions are compulsory (10 x 1 = 10 Marks )**

1. What is NOT a final control element?  
(A) Motor (B) Control valve (C) Potentiometer (D) Heater
2. Example of a closed loop system is  
(A) Ceiling fan (B) Room Air conditioner  
(C) Washing machine (D) Toaster
3. Effect of small hysteresis in On-Off Control is  
(A) improved accuracy (B) reduced frequency of oscillations  
(C) increased amplitude of oscillations (D) none of the above
4. Offset  
(A) exists in Proportional Control (B) is also known as Steady State Error  
(C) is removed by adding Integral Control (D) All of the above are true
5. Rate Control means  
(A) Proportional Control (B) Integral control  
(C) Derivative Control (D) On-Off Control
6. Cascade Control uses  
(A) 1 sensor (B) more than 1 actuator  
(C) more than 1 controller (D) none of the above is true

7. Distance Velocity Lag can be reduced by  
 (A) reducing distance only (B) reducing velocity only  
 (C) reducing distance and increasing velocity  
 (D) reducing both distance and velocity
8. Which sensor is non-contact type?  
 (A) Thermocouple (B) Radiation pyrometer  
 (C) Thermistor (D) Resistance thermometer
9. Venturi is used for measuring  
 (A) Pressure (B) Flow (C) temperature (D) level
10. Solar cell uses the following effect  
 (A) Photo voltaic (B) Photo conductive  
 (C) Photo emissive (D) Photo magnetic

### **Section B**

**All questions are compulsory (5 x 2 = 10 Marks )**

11. Define Offset  
 12. What are the performance measures and specifications of a Control System?  
 13. What are the various sensors used for flow measurement?  
 14. What do you mean by tuning of controllers?  
 15. Define Transfer Function

### **Section C**

**Answer any 5 questions (5 x 10 = 50 Marks )**

16. (a) Compare Open loop and closed loop systems (7)  
 (b) Compare Servo systems and Regulatory systems (3)
17. (a) Explain Split Range Control. (5)  
 (b) Explain Distance velocity lag with an example (5)
18. (a) Explain Nozzle flapper and its characteristics (5)  
 (b) Explain Variable Inductance transducer (5)
19. (a) Explain the various sensors for temperature measurement (5)  
 (b) Explain working of Synchro and its uses. (5)
20. (a) Explain Pneumatic actuators (7)  
 (b) What are the benefits of using Valve Positioners? (3)
21. Explain the UMS requirements (10)
22. Explain Piston (Jacket) cooling system with a neat sketch. (10)

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