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10MR841

Eighth Semester B.E. Degree Examination, June/July 2019

Marine Automation

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. What are the static and dynamic characteristics of the transducers? **(10 Marks)**

b. Explain with neat diagram, different types of position sensors (any two in detail). **(10 Marks)**

2 a. With a neat figure derive the expression for calculating theoretical discharge of venturimeter. **(10 Marks)**

b. Explain the working of photoconductive, photovoltaic and photoemissive cell with neat diagram. **(10 Marks)**

3 a. A differential manometer is connected at the two points A and B as shown in the Fig.Q3(a). At B, air pressure is 9.81 N/cm^2 (abs) find absolute pressure at A.

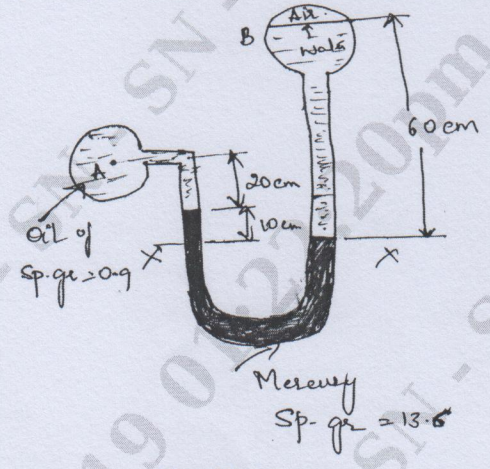

Fig.Q3(a) **(05 Marks)**

b. A horizontal venturimeter with inlet diameter 20 cm and throat diameter 10 cm is used to measure the flow of water. The pressure at inlet is 17.658 N/cm^2 and the vacuum pressure at the throat is 30 cm of mercury. Find the discharge of water through venturiment. Take $C_d = 0.98$. **(05 Marks)**

c. Derive an expression for temperature and temperature Lapse rate (L) for an adiabatic process at any certain height in an compressible fluid. **(10 Marks)**

4 a. Write notes on : i) Bimetallic strip (ii) Thermocouples (iii) Thermistors. **(10 Marks)**

b. Explain two position mode and multiposition mode of discontinous controller modes. **(10 Marks)**

PART – B

5 a. Draw the block diagram of integral controller and explain its characteristics. **(10 Marks)**

b. Draw the block diagram of PID controller and explain its effect on the system. **(10 Marks)**

6 a. Determine the transfer function (s)/R(s) of the system shown in Fig.Q6(a).

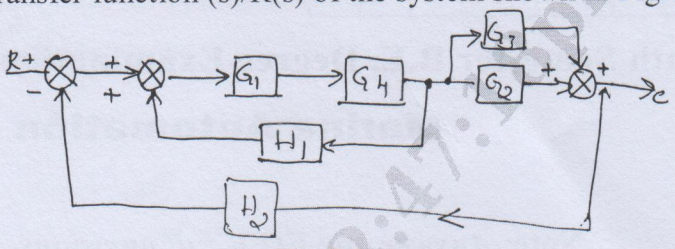

Fig.Q6(a) **(10 Marks)**

b. Write ten comparison of open loop and closed loop system. **(10 Marks)**

7 a. Explain the operations performed by signal conditioner. **(10 Marks)**

b. Draw functional block diagram of the sensor and explain. **(10 Marks)**

8 a. Explain about marine boilers. **(10 Marks)**

b. Write a note on simulations which can be implemented in shipping. **(10 Marks)**

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