Total No. of Questions : 12]

SEAT No. :

P1395

[Total No. of Pages : 3

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T.E. (Electronics)

Sensors & Interfaces

(2008 Pattern) (Semester - II)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer any three questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
6) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Explain pH measurement with neat diagram. **[8]**

b) Explain selection criterion for choosing a transducer. **[8]**

OR

Q2) a) Explain incremental and absolute rotary encoders for angular velocity measurement. **[8]**

b) Explain principle of flow measurement. Describe pitot tube used for flow measurement. **[8]**

Q3) a) A sensor outputs a range of 10 to 200 mv as a variable varies over its range. Develop a signal conditioning circuit using 3 OP-AMP instrumentation amplifier so that it becomes 0 to 5V. **[8]**

b) Explain with neat diagram I/P converter and P/I converter. **[8]**

P.T.O.

OR

Q4) a) Explain any one technique for level and humidity measurement. **[8]**

b) Write a short note on SMART transmitter. **[8]**

Q5) a) What are the different types of ADCs? Explain any one of them. Write a note on specifications of ADC. **[9]**

b) Describe working of R-ZR ladder type DAC. How it is advantageous over weighted register DAC. **[9]**

OR

Q6) a) Describe the working of a typical flash A/D converter for n bit operation. **[9]**

b) Enlist different types of DAC and give specifications of DAC. **[9]**

SECTION - II

Q7) a) Explain HART communication protocol along with its modes of operation. **[8]**

b) Write short note on foundation field bus. **[8]**

OR

Q8) a) Explain with block diagram computer based data logger. **[8]**

b) Explain with neat diagram IEEE 488 bus interface for test & measurement instruments. **[8]**

Q9) a) Explain following types of valves with neat diagram. **[8]**

i) Spool valve

ii) Poppet valve

b) Explain with neat diagram pressure control valves. **[8]**

OR

Q10) a) Explain lift system to move the load up and down using pneumatic actuators. **[8]**

b) Explain principle of operation of D.C. motor. State various types of D.C. motor. **[8]**

Q11) a) Draw and explain architecture of PLC. Compare PLC with a personal computer. State important specifications of PLC. **[10]**

b) Develop a ladder diagram for a circuit that can be used to start a motor and then after delay of 100 sec start a pump. when the motor is switched off there should be a delay of 10 sec. before the pump is switched off. **[8]**

OR

Q12) a) With suitable assumptions draw the block diagram of a bottle filling plant and develop a PLC ladder diagram for the automatic operation of bottle filling plant. **[10]**

b) Explain current source and current sink configuration of input & output channel. **[8]**

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