AR13

CODE: 13EI3002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, October-2021

INSTRUMENTATION AND CONTROL SYSTEMS

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What do you mean by Fidelity?
   b) Mention the limitations of Bourdon tube pressure gauge.
   c) Why rotameter is called variable area flow meter?
   d) List out advantages of thermocouples.
   e) Write the working principle involved in seismic instrument.
   f) What are the applications of load cells?
   g) What is the effect of adding zeros in a transfer function?
   h) What will be the impulse response if a system has single pole at origin?
   i) How do you determine the stability of a Nyquist plot?
   j) Define stable phase margin?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2.	a)	Discuss in detail about the dynamic performance characteristics of measuring instruments.	7
	b)	Explain the use of thermal conductivity gauges for pressure measurement.	5
		(OR)	
3.	a)	Describe the construction and explain the working of bourdon tube used for pressure measurement.	6
	b)	Explain the working of an ionization gauge to measure pressure. Write its advantages and limitations	6

UNIT-II

4.	a)	With a neat sketch explain the use of resistance strain gauges for bending, compressive and tensile strain measurements.	7
	b)	Explain the working of total radiation pyrometer with neat sketch.	5
		(OR)	
5.	a)	Explain the working of electrical strain gauge with neat sketch.	6
	b)	Explain the working principle of Hot-wire anemometer with a neat sketch.	6

UNIT-III

6. a) Give the classification of torsionmeters. Explain the construction and working of torsionmeters used for torque measurement. 7
   b) Explain the principle of working of vibrometer. 5

(OR)

7. a) Discuss in detail the working of any two types of dynamometers used for force measurement. 6
   b) Explain the Inductive transducer for measurement of displacement with neat sketch. 6

UNIT-IV

8. a) Describe the advantages of closed loop system over the open loop system? 5
   b) Find the stability of the control system having characteristic equation, $s^4+3s^3+3s^2+2s+1=0$ using Routh –Hurwitz criterion. 7

(OR)

9. a) Explain how root locus method is better than Routh Hurwitz criterion? 5
   b) A unity feedback system has open-loop transfer function **G(s) = K/s(s+2)**. Calculate the value of gain K so that the closed-loop system has a steady-state unit ramp error of 0.1. What are the corresponding damping factor and percentage peak overshoot to unit step input? 7

UNIT-V

10. Sketch the Nyquist plot for a system with the open-loop transfer function $G(s)H(s) = K(1+0.5s)(s+1) / (1+10s)(s-1)$. Determine the range of values of K for which the system is stable. 12

(OR)

11. a) Explain the applications of Nyquist Stability Criteria with suitable examples. 6
    b) Mention the advantages of PID control algorithms. 6

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CODE: 13EC3019 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, October-2021

MICROPROCESSORS AND MICROCONTROLLERS

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What are the basic units of Microprocessor?
   b) What is an instruction set?
   c) What are the different modes of 8279?
   d) What is an interrupt?
   e) What is master 8259?
   f) What is a baud rate?
   g) What are control signals used for DMA operation?
   h) Give few applications of 16 bit Microcontrollers.
   i) What is meant by Polling?
   j) How the low byte flag register can be modified in 8086?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. Explain the architecture of 8086 microprocessor? 12M

(OR)

3. a) Draw the Pin diagram of 8086 microprocessors and explain about Address and data pins 6M
   b) Draw the timing diagram of Read cycle of 8086 microprocessor. 6M

UNIT-II

4. a) Write an assembly language program to add series of 100 8-bit numbers 6M
   b) Explain about the stack segment and stack segment register. 6M

(OR)

5. a) Explain about Data Transfer Instructions. 6M
   b) What is the flow of an interrupt processing in microprocessor?

UNIT-III

6. a) Draw and explain the architecture of 80386micro processor with neat sketch? 6M
   b) Explain about different addressing modes supported by 80386 processor. 6M

(OR)

7. a) What is segmentation in 80386? 6M
   b) Explain about the Instruction set of 80386 micro processor. 6M

UNIT-IV

8. a) Explain about the different modes (BSR & I/O) of 8255 PIO. 6M
   b) Draw the pin diagram of 8251 USART and explain the function of each pin. 6M

(OR)

9. a) Draw the internal architecture of 8259 PIC and explain the function of each block. 6M
   b) Draw the internal architecture of 8255 PPI and explain the function of each block. 6M

UNIT-V

10. a) List the salient features of 8051 Microcontrollers. 6M
    b) Discuss about Branch and arthimetic instructions in 8051 Microcontroller. 6M

(OR)

11. a) Explain the five addressing modes available in 8051 microcontrollers with an example. 6M
    b) Explain about the Bit-Addressable RAM of 8051 Microcontroller. 6M

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