SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR

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QUESTION BANK

Subject with Code: Mechatronics(16ME332) **Course & Branch: B. Tech – ME**
Year/ Sem: IV-B. Tech & II-Sem **Regulation: R16**

UNIT I (CO1)

1.	(a)	Define Mechatronics with elaborate definition? And give examples of mechatronics system?	**L1**	**CO1**	**6M**
	(b)	Explain the various components of a Mechatronics system?	**L2**	**CO1**	**6M**
2.	(a)	What are the evoluation levels of mechatronics?	**L5**	**CO1**	**6M**
	(b)	Describe each component of typical mechatronics system and draw schematic diagram	**L3**	**CO1**	**6M**
3.	(a)	How does a GUI work? And what are the benefits of GUI?	**L2**	**CO1**	**6M**
	(b)	How does the user interact with a GUI, define GUI with examples of GUI operating system.	**L2**	**CO1**	**6M**
4.	(a)	What is operating system, GPOS, RTOS?	**L1**	**CO1**	**6M**
	(b)	List out components of real time operating system and explain them?	**L1**	**CO1**	**6M**
5.	(a)	What are the functions of the real time operating system and examples?	**L1**	**CO1**	**6M**
	(b)	What are the differences between GPOS and RTOS	**L2**	**CO1**	**6M**
6.	(a)	Draw with neat sketch of open loop control system and explain it	**L3**	**CO1**	**6M**
	(b)	Describe control system and explain features, components of control system?	**L1**	**CO1**	**6M**
7.	(a)	What are the practical examples of open loop control system	**L1**	**CO1**	**6M**
	(b)	With neat sketch explain closed loop control system	**L2**	**CO1**	**6M**
8.	(a)	With neat sketch explain humanoid robot with major elements?	**L2**	**CO1**	**6M**
	(b)	Distinguish between Robot , industrial robot and humanoid robot?	**L2**	**CO1**	**6M**
9.	(a)	Why is CNC machining necessary? Define CNC.	**L1**	**CO1**	**6M**
	(b)	Mention major components related to CNC machine tools?	**L2**	**CO1**	**6M**
10.	(a)	Write about Flexible manufacturing system?	**L6**	**CO1**	**6M**
	(b)	What is CIM? List out various processes involved in CIM?	**L2**	**CO1**	**6M**

UNIT II (CO2)

1.	(a)	Explain signal conditioning? And what are the processes occur in conditioning signal.	**L2**	**CO2**	**6M**
	(b)	Illustrate the functions of a signal conditioner?	**L4**	**CO2**	**6M**
2.	(a)	Differentiate between digital input and digital output?	**L2**	**CO2**	**6M**
	(b)	What is meant by analog input? Difference between analog input and digital input?	**L2**	**CO2**	**6M**
3.	(a)	How does operational amplifier work? Draw neatly sketch and symbol?	**L2**	**CO2**	**6M**
	(b)	Differentiate between analog and digital signals?	**L2**	**CO2**	**6M**
4.	(a)	Discuss the important hardware used in the signal conditioning?	**L1**	**CO2**	**6M**
	(b)	Show that sum of the current entering must equal that leaving in summing amplifier?	**L2**	**CO2**	**6M**
5.	(a)	What happens with increased and decreased resolution in computer?	**L1**	**CO2**	**6M**
	(b)	What is meant by resolution? Write common widescreen resolution in computer?	**L1**	**CO2**	**6M**
6.	(a)	Write the function of resistors and draw symbol of fixed resistor with ANSI standard?	**L6**	**CO2**	**6M**
	(b)	What are the properties of resistor?	**L1**	**CO2**	**6M**
7.	(a)	How does work capacitor? With capacitor basic configuration?	**L2**	**CO2**	**6M**
	(b)	Elaborately explain digital signal processing	**L2**	**CO2**	**6M**
8.	(a)	What is filter and give a classification of filters	**L2**	**CO2**	**6M**
	(b)	Explain characteristics of ideal filters with neat sketches?	**L2**	**CO2**	**6M**
9.		Explain analog to digital converter and digital to analog converter	**L1**	**CO2**	**12M**
10.	(a)	What is meant by filtering in signal conditioning? Explain notch filtering	**L1**	**CO2**	**6M**
	(b)	What is a DSP? What are the common features of DSP?	**L1**	**CO2**	**6M**

UNIT III (CO3)

1.	(a)	Explain the advantages of pneumatic actuator over hydraulic actuator?	**L1**	**CO3**	**6M**
	(b)	Actuators plays a primary role in mechatronics system explains it?	**L4**	**CO3**	**6M**
2.	(a)	Write classification of actuation system? Draw actuation system functional diagram?	**L2**	**CO3**	**6M**
	(b)	Draw motor drive system with velocity and angular position feedback explain it?	**L3**	**CO3**	**6M**
3.	(a)	Differentiate between bouncing and de-bouncing in electrical actuation system?	**L2**	**CO3**	**6M**
	(b)	How does solenoids work describe with neat sketch?	**L2**	**CO3**	**6M**
4.		Elaborate components of an hydraulic system with neat sketch	**L1**	**CO3**	**12M**
5.		What are the control valves function in hydraulic system? list categories of control valves Explain it with construction and functioning?	**L2**	**CO3**	**12M**
6.	(a)	Describe the basic components of pneumatic system with neat diagram?	**L2**	**CO3**	**6M**
	(b)	In automated industrial pneumatic controllers essential justify it?	**L4**	**CO3**	**6M**
7.	(a)	Draw switch contact configurations? Explain uses?	**L2**	**CO3**	**6M**
	(b)	What are the logic blocks elementary logic functions?	**L1**	**CO3**	**6M**
8.	(a)	Describe working of timing belt? What happens if the timing belt breaks?	**L2**	**CO3**	**6M**
	(b)	Sketch OR valve construction and symbol and explain it?	**L3**	**CO3**	**6M**
9.	(a)	In hydraulic system gear pumps and vane pumps draw neat diagrams explain it?	**L2**	**CO3**	**6M**
	(b)	What are the mechanical actuation system functions?	**L1**	**CO3**	**6M**
10.	(a)	Explain an electro-hydraulic actuation system with position control with neat sketch.	**L2**	**CO3**	**6M**
	(b)	Describe performance Characteristics of Actuators	**L1**	**CO3**	**6M**

UNIT IV (CO4)

1.	(a)	explain high voltage circuit breaker? List out classification describe any one type?	**L1**	**CO4**	**6M**
	(b)	What is meant by resettable fuse describe operation of resettable fuse?	**L1**	**CO4**	**6M**
2.	(a)	What is circuit breaker? Describe working principle of circuit breaker with neat sketch	**L2**	**CO4**	**6M**
	(b)	What does Power Supply mean?	**L4**	**CO4**	**6M**
3.	(a)	Describe the working of bipolar transistor with a neat sketch	**L3**	**CO4**	**6M**
	(b)	Distinguish NPN and PNP transistors? With construction and symbols explain it?	**L2**	**CO4**	**6M**
4.	(a)	What is MOSFET? Explain two functions with neat sketch?	**L1**	**CO4**	**6M**
	(b)	What is a Buffer in Electronics? What is a buffer IC used for?	**L1**	**CO4**	**6M**
5.	(a)	Describe Generation of Pulse Width Modulation with neat sketch?	**L3**	**CO4**	**6M**
	(b)	What is Pulse Width Modulation? With sketch explain it?	**L3**	**CO4**	**6M**
6.	(a)	Explain function of Stepper motor with neat sketch?.	**L1**	**CO4**	**6M**
	(b)	Sketch solenoid construction, circuit, and cut away section explain it?	**L3**	**CO4**	**6M**
7.	(a)	What are the electromechanical drives? Explain relay function	**L2**	**CO4**	**6M**
	(b)	Differentiate between operation of a relay coil energized and de energized?	**L2**	**CO4**	**6M**
8.	(a)	Explain the construction and principle of operation of DC servomotor with a neat sketch	**L3**	**CO4**	**6M**
	(b)	Explain the working principle of brushless permanent magnet D.C motor	**L2**	**CO4**	**6M**
9.		Explain the construction & principle of operation of permanent magnet stepper motor. And what are the applications of it?	**L4**	**CO4**	**12M**
10.	(a)	Define coupling in amplifier? What are the main types of couplings explain?	**L2**	**CO4**	**6M**
	(b)	Draw protection circuit and explain it with few features?	**L3**	**CO4**	**6M**

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UNIT V(CO5)

1.	(a)	How do micro controller work	**L2**	**CO5**	**6M**
	(b)	What are the elements of a microcontroller	**L1**	**CO5**	**6M**
2.	(a)	What are the supporting elements include of a microcontrollers and draw block diagram of Microcontroller	**L3**	**CO5**	**6M**
	(b)	Explain the following i) ADC ii) DAC iii) system bus	**L1**	**CO5**	**6M**
3.		How does a programmable logic controller work? Draw basic structure of PLC and explain it.	**L3**	**CO5**	**12M**
4.	(a)	Differentiate between ADC and DAC	**L2**	**CO5**	**6M**
	(b)	Describe the different types of memory commonly available on a Microcontroller.	**L2**	**CO5**	**6M**
5.	(a)	What are the applications of 8051 microcontroller?	**L4**	**CO5**	**6M**
	(b)	List out the various functional blocks of 8051 micro-controller	**L2**	**CO5**	**6M**
6.		Draw ladder logic diagram and describe it with few examples of industrial automation?	**L4**	**CO5**	**12M**
7.		Which type microcontroller is most commonly used? Discuss architecture of 8051 Microcontroller`	**L3**	**CO5**	**12M**
8.	(a)	Write Opcodes which are used in handheld programming devices	**L6**	**CO5**	**6M**
	(b)	Explain ladder logic programming with few symbols and terminologies	**L2**	**CO5**	**6M**
9.	(a)	How does a work internal relay in PLC with sketch explain it?	**L3**	**CO5**	**6M**
	(b)	Draw flip flop shift register and explain it?	**L3**	**CO5**	**6M**
10.	(a)	How does 8bit binary number is converted into a decimal number is 173?	**L3**	**CO5**	**6M**
	(b)	What aspects should be considered for the selection of a PLC for the application?	**L2**	**CO5**	**6M**

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