



SYED AMMAL ENGINEERING COLLEGE

Approved by the AICTE, New Delhi, and Affiliated to Anna University, Chennai, Govt. of Tamilnadu
Dr. E.M.Abdullah Campus, Ramana thapuram – 623 502.

Department of Mechanical Engineering



Sem: 7

ME6702- Mechatronics

Class: IV year Mechanical

Question Bank

Book Reference:

1. Dr.P.Marimuthu, G.Prabhakar and Dr.S.Selvaperumal, “**Mechatronics**”, Anuradha Publications 2016.

Possible Two Marks Questions:

Unit 1

Chapter 1:

1. Define Mechatronics
2. What is mechatronic approach?
3. Mention the functions of a mechatronic system.

Chapter 2:

1. What is potentiometer?
2. What are the advantages and disadvantages of potentiometer?
3. What is resistance thermometers?
4. What are the applications of thermistors?
5. Mention the applications of strain gauge.
6. What is LVDT?
7. What are the advantages and disadvantages of LVDT?
8. What are the applications of LVDT?
9. What are the different transfer characteristics of the transducer?
10. What is strain?
11. Define sensitivity
12. State the advantage & disadvantage of capacity type proximity sensor
13. List any four types of sensors.
14. What is the basic principle in thermocouples?
15. Define measurement system with a block diagram.
16. Difference between absolute encoder and incremental encoder.



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Unit-2

Chapter 3:

1. Define Mnemonics.
2. List the various machine cycles of 8085.
3. What is the need for a timing diagram?
4. How many instructions are available in the 8085 instruction set?
5. What is addressing?
6. What are the addressing modes available in 8085?
7. What is PSW?
8. What is the difference between CALL and JUMP instruction in 8085?
9. What is ALE?
10. Define PC
11. List the 8085 instructions that affect only carry flag.
12. What is a flag?
13. Explain the function of ALU and IO/M signals in the 8085 architecture?
14. Write down the control and status signals of 8085 microprocessor?
15. Give the functional categories of 8085 microprocessor instructions?
16. Define Microprocessor?
17. What are the limitations of 8085 MPU?
18. Why the microprocessor is viewed as a programmable Device?
19. What is microcontroller?
20. Compare Microprocessor and Microcontroller.

Unit-3

Chapter 5:

1. What is a programmable peripheral device?
2. What are the internal devices of 8255?
3. Write down the output control signals used in 8255A PPI?
4. What is the purpose of 8255 PPI?
5. What are the operating modes of port -A 8255?
6. What are the functions performed by port-C of 8255?
7. What is debouncing ?
8. Define A/D and D/A converters?
9. What is resolution?
10. To interface an A/D converter with the microprocessor, what does the microprocessor do?
11. What is interfacing
12. Define LED
13. What is meant by temperature control



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Unit-4

Chapter 6:

1. Define a programmable logic controller.
2. What are the main component parts of a PLC?
3. What is the function of Programming devices?
4. List various types of PLC programming devices.
5. List down the types of buses required in a PLC.
6. What is ALU? State its function.
7. Highlight the important role of control unit.
8. What are counters?
9. Write down various types of counters.
10. When are cascaded counters needed?
11. At what conditions master control is used?
12. How does jump control work?
13. Categorize data manipulation in shift registers.
14. List down PLC programming methods.
15. What are the types of memory?
16. How will you process the input and output of PLC?
17. List down the input and output modules interface.
18. What are the features of PLC?
19. Draw the ladder diagram for Ex-or gate.
20. What is an internal relay in a PLC?
21. What is an output relay in a PLC?

Unit-5

Chapter 4:

1. What is the function of hydraulic power system?
2. How do you define pneumatic system?
3. Name the control components in a hydraulic actuation system.
4. What is servo motor?
5. Highlight the properties of a stepper motor.
6. Difference between hydraulic and pneumatic systems
7. What are the functions of mechanical actuation systems?
8. What is DC motor?
9. What is AC motor?
10. What is Stepper motor?

Chapter 7:

1. List the drawbacks of traditional design approach.



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2. Compare traditional and mechatronic design
3. list the sensors & actuators used in pick & place robot systems
4. What is an engine management?
5. What are the uses of sensors?
6. What are the stages in designing a Mechatronics system?
7. Mention any 4 statements about the problem definition.
8. What is the function of decoder?
9. What are the various movements of robots?
10. Name the 2 barriers used in automatic car parking system and state its uses.
11. List the various sensors contained in engine management system.
12. Point out the 2 important operations categories of sensors in engine management.
13. List out the various sensors used in engine management system.



Possible 16 and 8 Marks Questions:

Unit-1

Chapter 1:

1. Explain the need for Mechatronics.
2. Write in detail about the emergence of Mechatronics.
3. Write about the classification in Mechatronics.

Chapter 2:

4. List and define the dynamic characteristics of sensors. **(Anna University-Mech- Nov/Dec 2012)**
5. Explain any two types of temperature measurement sensor **(Anna University-Mech May/June 2014)**
6. Explain the relationship between temperature and resistance for the RTD with temperature resistance curve. What are the advantages and disadvantages of RTDs? **(Anna University- Mech-Nov/Dec 2014)**
7. Explain the functions of a capacitive sensor in a robot end effector. **(Anna University- Mech-Nov/Dec 2014)**
8. Write short notes on incremental encoder **(Anna University- Mech-Nov/Dec 2014)**
9. Explain the control system for the domestic central heating system involving a bimetallic thermostat and that involving a microprocessor. **(Anna University- Mech-Nov/Dec 2014)**
10. Explain the construction, working and applications of following: **(Anna University-Mech- April/May 2015)**
 - Proximity sensor
 - Velocity sensor

Unit-2

Chapter 3:

1. Draw the pin diagram of 8085 microprocessor or signal configuration of 8085. **(Anna University-EEE- Dec 2012, April/May 2014)**
2. Explain the architecture, data flow and instruction execution of 8085 microprocessor. **(Anna University-EEE- April/May 2011)**
3. With timing diagram, explain the memory read operation in 8085 microprocessor. **(Anna University-EEE- April/May 2011)**
4. Describe the instruction format and addressing modes of 8085 microprocessor. **(Anna University-EEE- April/May 2011)**
5. With suitable example, discuss about 8085 microprocessor instructions used for data manipulation. **(Anna University-EEE- April/May 2011)**
6. Discuss about the organisation of internal RAM and special function registers of 8051 microcontroller in detail. **(Anna University-EEE- April/May 2011)**
7. Compare the similarities and differences of CALL and RET instructions with PUSH and POP instructions. **(Anna University-EEE- Nov/Dec 2011)**
8. Explain the program memory and data memory structure of 8051 microcontroller. **(Anna University-EEE- Nov/Dec 2011)**
9. Draw the pin diagram of 8051 microcontroller and explain its port structure. **(Anna University-EEE- Nov/Dec 2011)**



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10. Draw the TMOD register format and explain the different operating modes of timer in 8051 microcontroller. (Anna University-EEE- Nov/Dec 2011)
11. Draw the timing diagram of opcode fetch machine cycle and I/O read cycle. (Anna University-EEE- April/May 2012)
12. Describe with suitable examples the data transfer, loading and storing instructions. (Anna University-EEE- April/May 2012)
13. Explain with a neat block diagram the architecture of 8051 microcontroller. (Anna University-EEE- April/May 2012, Dec 2014)
14. Explain the interrupt structure of 8051 microcontroller. (Anna University-EEE- Nov/Dec 2012, 2014)
15. Describe the categories of instructions used for data manipulations in 8085 microprocessor. (Anna University-EEE- April/May 2013)
16. Discuss about the Timers in 8051 with suitable examples. (Anna University-EEE- Nov/Dec 2013)

Unit-3

Chapter 5:

1. Explain the operation of 8255 PPI Port A programmed as input and output in mode 1 with necessary handshaking signals. (Anna University-EEE- April/May 2011)
2. Show and explain the ADC interfacing with 8085 microprocessor. (Anna University-EEE- April/May 2011)
3. Explain the operating modes of 8255 programmable peripheral interface. (Anna University-EEE- Nov/Dec 2011)
4. Explain the keyboard interfacing with 8085 microprocessor through 8255 PPI. (Anna University-EEE- Dec 2012)
5. Why do we need A/D converter and D/A converter? Draw the block diagram to interface 8085 microprocessor with A/D converter and D/A converter. (Anna University-EEE- Nov/Dec 2011)
6. Explain the LED display interfacing with 8085 microprocessor through 8255 PPI.
7. Write about the temperature control using 8085 microprocessor through 8255 PPI.
8. Explain how to control the stepper motor using 8085 or 8051. (Anna University-EEE- April/May 2012, May 2013)
9. Discuss in detail about the traffic light control and interface using 8085 microprocessor.

Unit-4

Chapter 6:

1. Explain the configuration of a PLC. List the considerations in selecting a PLC. (Anna University-Mech- Nov/Dec 2012, May/June 2014)
2. Using simple programs explain the data handling operations in a PLC. (Anna University-Mech- Nov/Dec 2012)
3. Give Advantages of PLC system over traditional mechanical system. (Anna University-Mech- May/June 2014)
4. Explain the following: a) Internal Relays b) Counters c) Timers. (Anna University-Mech- May/June 2014)
5. Explain the basis of Ladder Programming used in PLC's. (Anna University-Mech- Nov/Dec 2014)
6. Draw delay ON and delay OFF timer ladder Diagrams. (Anna University-Mech- Nov/Dec 2014)
7. Explain latching with ladder diagram. (Anna University-Mech- Nov/Dec 2014)
8. Explain four data handling operations carried out by PLC. (Anna University-Mech- April/May 2015)



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9. Draw the architecture of PLC with a block diagram and explain. (Anna University-Mech- April/May 2015)
10. Write the specifications of PLC. (Anna University-Mech- April/May 2015)
11. Write about PLC Ladder Programming with combinational circuit examples.
12. What are the factors to be considered for selecting a PLC? (Anna University-Mech- Nov/Dec 2014)

Unit-5

Chapter 4:

1. Using a simple circuit explain the basic components required for a hydraulic actuation system. (Anna University-Mech- Nov/Dec 2012)
2. With the help of proper control circuits explain the speed control of AC and DC motors. (Anna University-Mech- Nov/Dec 2012)
3. Describe the working of an AC servo motor.
4. Explain construction and working principle of AC and DC motor. (Anna University-Mech- May/June 2014)
5. What is a stepper motor? Explain the working principles of stepper motor in half step mode. (Anna University-Mech- Nov/Dec 2014)
6. Explain the types of stepper motor.
7. Explain the hydraulic system with suitable diagrams
8. Explain the Pneumatic system with suitable diagrams
9. Explain the working principle of servomotor.
10. Write in detail about the BLDC motor.

Chapter 7:

1. Explain about the mechatronic system design of an automatic car park barrier. (Anna University-Mech- May/June 2013, May/June 2014, May 2015)
2. Explain the various stages in Mechatronics design approach and state how it differs from the traditional approach. (Anna University-Mech- Nov/Dec 2012)
3. What is the role of sensors in car engine management system? Explain with block diagram. (Anna University-Mech- Nov/Dec 2014)
4. Explain in detail about the wireless controlled pick and place robotic system.