SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY

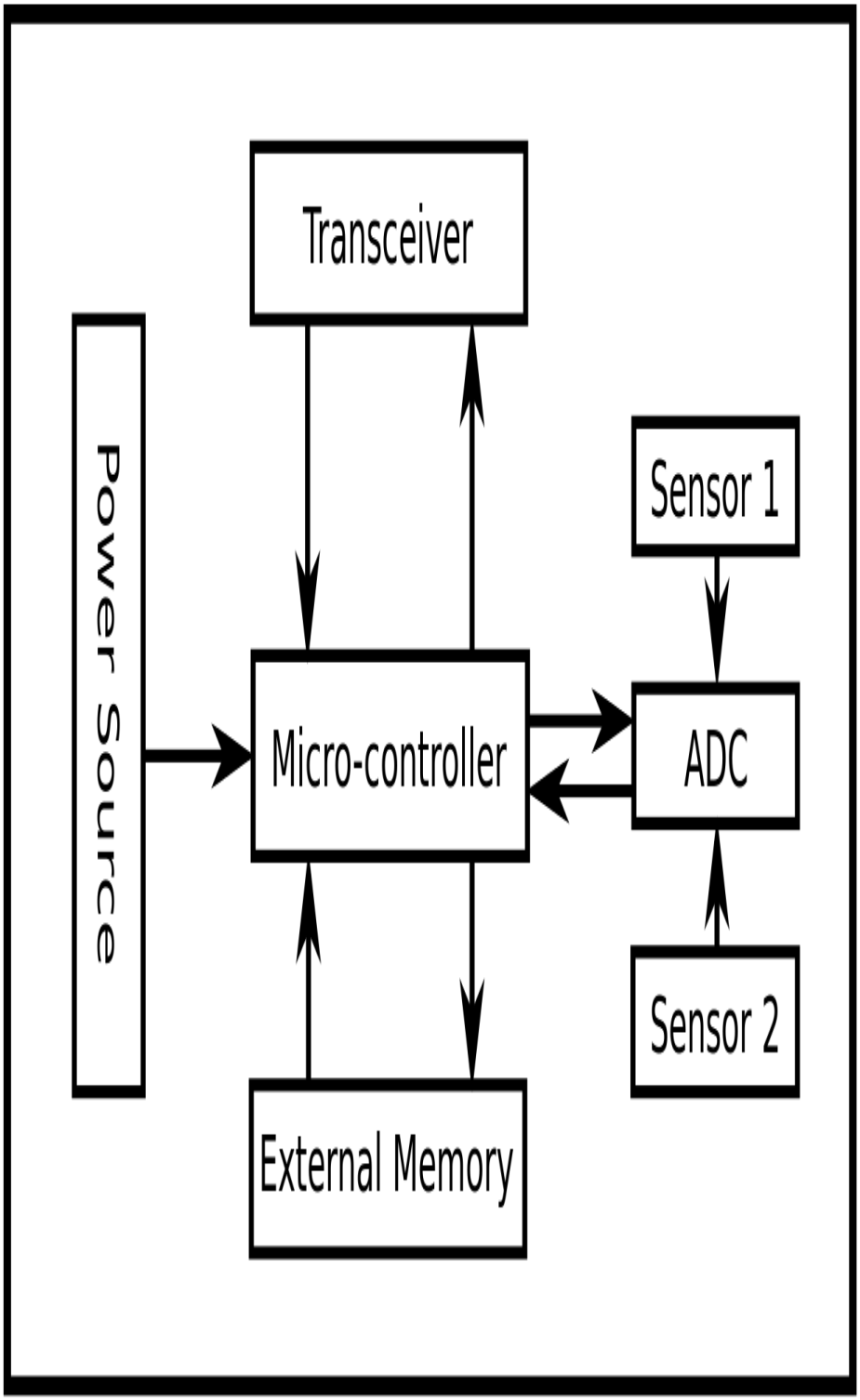
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

QUESTION BANK

SCSA1701CYBER PHYSICAL SYSTEMS

UNIT – III

S. No	PART-A	CO	Blooms Level
1	Define sensor. Classify different types of sensors A sensor is a device that detects and responds to some type of input from the physical environment. 1. **Direct Sensor**: A sensor that can convert a non-electrical stimulus into an electrical signal with intermediate stages. Eg: thermocouple (temperature to voltage). 2. **Indirect Sensor**: A sensor that multiple conversion steps to transform the measured signal into an electrical signal. Eg: fiber-optic displacement sensor (light current to photons to current).	CO3	L1
2	Define Actuators? Mention the different types of Actuation systems An actuator is **a machine component that is used for moving and controlling a system or mechanism**. Hydraulic Actuators · Pneumatic Actuators · Electrical Actuators	CO3	L1
3	State distributed system Distributed system a system in which components are distributed across multiple locations and computer-network.	CO3	L1
4	Point out any four applications of WSN. easier to deploy maintain and offer better flexibility of devices don't need the physical network infrastructure to be modified cost effective	CO3	L3

5	Sketch the sensor node with its components  	CO3	L3
6	Classify multiple access protocols **random access protocols, controlled access protocols and channelization protocols** https://www.tutorialspoint.com/multiple-access-protocols-in-computer-networks#:~:text=Multiple%20access%20protocols%20can%20be,access%20protocols%	CO3	L2

	20and%20channelization%20protocols.		
7	What are real-time communication protocols? **WebSocket** **XMPP** **WebRTC** **The Bayeux Protocol** **Server-Sent Events** **Wave Federation Protocol** **IRC**	CO3	L1
8	What are middleware architecture types examples? Game Engines Device Middleware Integration Middleware	CO3	L1
9	What do you mean by micro sensors? These are a sensors which perform the necessary actions given but, the size and development is small in size and faster in development	CO3	L1
10	What is meant by signal processing? **Signal processing is an electrical engineering subfield that focuses on analysing, modifying, and synthesizing signals such as sound, images, and scientific measurements.**	CO3	L1
11	Compare real time and distributed systems. https://www.atikaschool.org/kcse-computer-studies-questions-and-answers-836310/distinguish-between-real-time-operating-system-and-distributed-operating-system#:~:text=Distinction%20between%20real%2Dtime%20and,not%20share%20memory%20or%20clock.	CO3	L4

S.No	PART- B	CO	Blooms Level
1	Describe with neat diagram the architecture of wireless sensor networks	CO3	L2
2	Discuss in detail about various real time communication protocols.	CO3	L2
3	Explain the middleware architecture for distributed real-time and secure services.	CO3	L5

4	Write short notes on a) collaborative signal processing b) Data Gathering	CO3	L3
5	Analyze the various applications of sensors and actuators.	CO3	L4
6.	Write briefly about Time dependent systems and clock synchronization.	CO3	L3