MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)

Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

Department of Electronics and Communication Engineering
Question Bank - Academic Year (2021-22)

Course Code & Course Name : 19BMC14 & EMBEDDED SYSTEMS

Year / Sem / Sec : III / VI /

UNIT-I: ARCHITECTURE OF EMBEDDED SYSTEMS

Part-A (2 Marks)

1. What is an embedded system?
2. Differentiate between a general purpose computing system and an Embedded System.
3. Give some development tools for Embedded System.
4. What are the different categories of embedded systems? Give examples of each Category.
5. List the various application areas of embedded systems and give examples for each application area
6. What are the special considerations in designing embedded systems?
7. Can you provide a definition for interrupts?
8. List the embedded systems used in the military applications
9. Compare RISC and CISC.
10. Give some important testing tools for Hardware development in embedded systems

Part-B (16 Marks)

1.	(i)	Explain in detail about recent trends in Embedded System	(8)
	(ii)	Illustrate the various categories of embedded systems.	(8)
2.		Explain in detail about hardware architecture of an embedded system.	(16)
3.		Explicate in detail about architecture of embedded system	(16)
4.		Explain the internal architecture of a processor.	(16)
5.	(i)	Describe the various communication interfaces used for embedded systems to interact with the external world	(8)
	(ii)	Explain about hardware and software development/Testing tools.	(8)

UNIT-II: ARM ARCHITECTURE

Part-A (2 Marks)

1. What is ARM processor?

2. List out features used in ARM processor
3. What are the features rejected by the ARM designers while designing ARM?
4. What is the use of CPSR?
5. What are the four condition code flags?
6. List the categories of ARM instructions?
7. Which features does ARM have in common with many other RISC architectures?
8. What is meant by 3-stage pipeline and 5-stage pipeline?
9. What are the two principal mechanisms used to implement an ARM processor core
10. Define Handshaking? What are the signals used in handshaking?

Part-B (16 Marks)

1.	Elucidate in detail about Architectural Inheritance of ARM processor.	(16)
2.	Discuss in detail about ARM development tools.	(16)
3.	Demonstrate 3-stage pipelining of ARM organization.	(16)
4.	Illustrate 5-stage pipelining of ARM organization	(16)
5.	Describe Thumb programmer's Model	(16)

UNIT-III: EMBEDDED COMMUNICATION PROTOCOLS

Part-A (2 Marks)

1. Distinguish between serial and parallel communications
2. Mention out some UART Standards.
3. Discriminate the RS232?
4. List different Types of Serial communication protocols.
5. What is meant by SPI?
6. Define CAN standard. Also depict CAN message format?
7. Define I2C
8. List out the examples of I2C bus
9. What are the applications of PCI bus?
10. What different exist between PCI and ISA protocol?

Part-B (16 Marks)

1.	(i)	Contrast the serial communication protocols used in Embedded Systems for communication.	(8)
	(ii)	Analyze how a byte is transferred to a slave device using I2C bus.	(8)
2.		Explain in detail about Universal Serial Bus	(16)
3.		Explain in detail about Parallel communication protocols with its relevant diagrams.	(16)
4.	(i)	Describe i) SPI ii) UART iii) ISA iv) PCI bus protocols.	(8)
	(ii)	Write short notes on Ethernet and I2C	(8)
5.		Brief about the overview and Architecture of Internet of Things with neat diagram.	(16)

UNIT-IV: REAL-TIME OPERATING SYSTEM CONCEPTS

Part-A (2 Marks)

1. Define task and Task state
2. What are the goals of RTOS?
3. Define RTOS and its types
4. List the functions of Kernel.
5. Define Interrupts and its Types.
6. What are all the types of Multitasking?
7. Define Interrupts Latency
8. Define Message Queues
9. Define Message Mailboxes
10. Define Preemptive Kernels

Part-B (16 Marks)

1.	Explain in detail about How to choose a RTOS	(16)
2.	Explain the architecture of kernel.	(16)
3.	Explain the RT Linux, VX Works and µCOS.	(16)
4.	Explain any three types of inter process communication functions between the tasks	(16)

5. What are features of VxWorks and explain detail about different functions used in VxWorks RTOS (16)

UNIT-V: APPLICATIONS

Part-A (2 Marks)

1. Application of Automated Teller Machine.
2. Application of Home Security System.
3. Application of finger print identifier.
4. Write principal of Digital camera
5. Application of printers
6. Draw State Diagram of ATM
7. Draw State Diagram of Software Modem
8. Application of Audio Player.
9. Draw State Diagram finger print identifier
10. What are the hardware components of ATM?

Part-B (16 Marks)

1. Explain briefly about various design process in Automated Teller Machine. (16)
2. Explain briefly about various design process in a Home Security System. (8)
3. Explain Working Principle of State Diagram and Architecture of Digital camera (16)
4. Explain briefly about various design process in a finger print identifier. (16)
5. (i) Short notes on cruise control (8)
   (ii) Short notes on printers (8)

Course Faculty **HOD**