HallTicketNo | | | | | | | | | | | Question Paper Code:BCSB22

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER - I

M.Tech III Semester End Examinations (Regular), November – 2019

Regulations: R18

EMBEDDED REAL TIME OPERATING SYSTEMS

(Embedded Systems)

Time:3hours **Max. Marks:70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1.	a)	Explain i)fork ii) vfork iii)exit iv)wait v) waitpid	**[7M]**
	b)	Write about the kernel services in an OS	**[7M]**
2.	a)	What are the basic operating system services available? Explain how to perform memory management for a specific operating system	**[7M]**
	b)	Explain file I/O functions: Lseek, open, Read, Write.	**[7M]**

UNIT – II

3.	a)	Define scheduler. Explain any scheduling algorithm?	**[7M]**
	b)	What are the various RTOS task scheduling models available? Explain any one of them in details?	**[7M]**
4.	a)	Explain the message queen and different states in queue?	**[7M]**
	b)	Explain briefly about semaphores with examples?	**[7M]**

UNIT – III

5.	a)	Define the table for kernel services in an operating system with functions and actions	**[7M]**
	b)	Explain the event registers and signals with examples	**[7M]**
6.	a)	Differentiate process and thread and and define task and explain with diagram all the five states of task	**[7M]**
	b)	Explain the basics I/O concepts with examples	**[7M]**

UNIT – IV

7.	a)	What are the applications of exceptions and interrupts in RTOS	**[7M]**
	b)	Explain the exceptions and what is the process of handling exceptions?	**[7M]**

8. a) Explain the interrupts, spurious interrupts with examples **[7M]**
   b) Explain the Interrupt service routines in an RTOS **[7M]**

UNIT – V

9. a) Explain all the specifications of Hardware architecture of ACVM system. **[7M]**
   b) Draw and explain the architecture for Air Traffic Control(ATC) **[7M]**

10. a) Illustrate the block diagram of Automatic Chocolate Vending Machine System(ACVM) **[7M]**
    b) Define porting of RT Linux .Discuss general requirements of processor to port RT Linux along with hardware/software architecture **[7M]**

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COURSE OBJECTIVES:
The course should enable the students to:

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I	Understand the process of real-time system design.
II	Use different scheduling algorithms for design of real time systems
III	Identify the tools and programming language for development of real time systems.
IV	Understanding the real time programming using case study
V	Understand the process of real-time system design

COURSE OUTCOMES (COs):

I	Understand the concepts of various operating systems for embedded systems and describe the basic commands to perform operations on files.
II	Explore the structures, task services, states and other basic operations of the real time operating systems.
III	Demonstrate the objects, services, I/Os and other building blocks of the real time operating systems.
IV	Explore exceptions, timers interrupts, service routines and other operations of the RTOS.
V	Develop knowledge and practical skills through case studies of various RTOS

COURSE LEARNING OUTCOMES (CLOs):

BES214.01	Understanding the basic UNIX/LINUX programming.
BES214.02	Understand the overview of commands, file I/O process control.
BES214.03	Understanding the basic f history of OS, defining RTOS, Scheduler, objects, services, characteristics of RTOS
BES214.04	Analyze the defining a task, task states and scheduling, task operations, structure, synchronization
BES214.05	Analyze the communication and concurrency, defining semaphores, operations and use, defining message queue
BES214.06	Understand the states, content, storage, operations and use.
BES214.07	Evaluate the Pipes, event registers, signals, other building blocks, component configuration.
BES214.08	Evaluate the Basic I/O concepts, I/O subsystem. Exceptions, interrupts, applications, processing of exceptions and spurious interrupts
BES214.09	Analyze the real time clocks, programmable timers, timer interrupt service routines, soft timers, operations
BES214.10	Understand the basic concepts of RT Linux, Micro C/OS-II
BES214.11	Understand the basic concepts of Vx works, embedded Linux, tiny OS
BES214.12	Understand the basic concepts of basic concepts of android OS.PO

MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES:

SEE Question Number		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	CLO 1	Understand the basic UNIX/LINUX programming.	CO 1	Understand
	b	CLO 2	Understand the overview of commands, file I/Oprocess control.	CO 1	Understand
2	a	CLO 2	Understand the overview of commands, file I/Oprocess control.	CO 1	Understand
	b	CLO 3	Understand the history of OS, RTOS, characteristics of RTOS	CO 1	Understand
3	a	CLO 4	Understand the defining a task,states, scheduling and synchronization.	CO 2	Understand
	b	CLO 5	Understand the various components of the RTOS.	CO 2	Understand
4	a	CLO 5	Understand the various components of the RTOS.	CO 2	Understand
	b	CLO 6	Analyze the objects and services of the RTOS.	CO 3	Analyze
5	a	CLO 7	Evaluate the Pipes, event registers, other building blocks, and component configuration.	CO 3	Analyze
	b	CLO 6	Analyze the objects and services of the RTOS	CO 3	Analyze
6	a	CLO 7	Evaluate the Pipes, event registers, other building blocks, and component configuration.	CO 3	Analyze
	b	CLO 8	Understand the device I/O management, Exceptions, interrupts and event handling.	CO 3	Analyze
7	a	CLO 8	Understand the device I/O management, Exceptions, interrupts and event handling.	CO 3	Analyze
	b	CLO 9	Analyze the real time clocks, Programmable timers, timer interrupt service routines.	CO 4	Remember
8	a	CLO 9	Analyze the real time clocks, Programmable timers, timer interrupt service routines.	CO 4	Remember
	b	CLO 10	Understand the basic concepts of RT Linux, Micro C/OS-II	CO 4	Remember
9	a	CLO 10	Understand the basic concepts of RT Linux, Micro C/OS-II	CO 4	Remember
	b	CLO 11	Understand the basic concepts of Vx works, embedded Linux, tiny OS	CO 5	Understand
10	a	CLO 11	Understand the basic concepts of Vx works, embedded Linux, tiny OS	CO 5	Understand
	b	CLO 12	Understand the basic concepts of android OS.	CO 5	Understand

Signature of CourseCoordinator **HOD, ECE**