INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad - 500 043

ELECTRONICS AND COMMUNICATION ENGINEERING

TUTORIAL QUESTION BANK

Course Name	:	REAL TIME OPERATING SYSTEMS
Course Code	:	BES214
Class	:	I - M. Tech
Branch	:	EMBEDDED SYSTEMS
Year	:	2016– 2017
Course Coordinator	:	N.ANUSHA
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OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

Unit-I INTRODUCTION			
Group – A (Short Answer Questions)			
S. No	Questions	Blooms Taxonomy Level	Course Outcome
1.	What is RTOS ?	Knowledge	1
2.	What is open, create,close?	Knowledge	1
3.	Write the command for file I/O?	Knowledge	1
4.	Write the command for lseek, read, write?	Understand	1
5.	What is process control what are the commands used for it?	Knowledge	1
6.	What is fork and v fork and write commands?	Knowledge	1
7.	Write commands for exit, wait ?	Knowledge	1
8.	Write commands for wiatpid,exec ?	Knowledge	1
9.	What is UNIX	Understand	2
10.	What is LINUX?	Knowledge	2

	Group - B (Long Answer Questions)		
S. No	**Questions**	**Blooms Taxonomy Level**	**Course Outcome**
1.	Define RTOS. What are the key characteristics of an RTOS	Understand	1
2.	Explain file I/O functions: Lseek, open, Read, Write.	Understand	1
3.	What is a kernel. Explain the Kernel services in an operating system	Knowledge	1
4.	What are OS services? Explain the structures of user and supervisory mode.	Knowledge	1
5.	What are RTOS services	Understand	2
6.	Write about the kernel services in an OS.	Understand	2
7.	What are the basic operating system services available? Explain how to perform memory management for a specific operating system	Knowledge	2
8.	Explain an embedded system design approach using an RTOS environment	Knowledge	2
9.	Explain the file I/O commands brefily	Understand	1
10.	Explain i)fork ii) vfork iii)exit iv)wait v) waitpid	Knowledge	1

	Unit-II REAL TIME OPERATING SYSTEMS		
	Group – A (Short Answer Questions)		
S. No	**Questions**	**Blooms Taxonomy Level**	**Course Outcome**
1.	What is OS?	Knowledge	1
2.	What is the difference between OS and RTOS?	Knowledge	1
3.	What are the characteristics of RTOS	Understand	1
4.	What is a scheduler and what are its services?	Understand	1
5.	Define a task ?	Understand	1
6.	What are task operations?	Knowledge	1
7.	What is message queue?	Knowledge	1
8.	What is semaphores ?	Understand	1
9.	What is concurrency?	Knowledge	1
10..	What are operations and its uses	Knowledge	2

	Group – B (Long Answer Questions)		
S. No	Questions	Blooms Taxonomy Level	Course Outcome
1.	Explain the scheduling algorithms to a weighted round robin approach with an example?	Knowledge	2
2.	What is meant by scheduling mechanism? List any 4 scheduling algorithms and explain one of them with example?	Understand	2
3.	What are the different types of scheduling strategies used in RTOS? Explain briefly?	Knowledge	2
4.	Explain task states and scheduling?	Knowledge	2
5.	Define scheduler. Explain any scheduling algorithm?	Understand	2
6.	What are the various RTOS task scheduling models available? Explain any one of them in details?	Knowledge	2
7.	Explain the message queen and different states in queue?	Knowledge	2
8.	Explain briefly about semaphores with examples?	Understand	4
9.	Explain the communication and concurrency with examples?	Understand	4
10.	Explain the synchronization and task operation with examples?	Understand	4

Unit-III
OBJECTS, SERIVECES AND I/O

	Group – A (Short Answer Questions)		
S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	What is a pipe?	Knowledge	1
2	What is event register?	Knowledge	1
3	What is a signal?	Knowledge	1
4	What are building blocks?	Understand	1
5	Write about component configuration?	Knowledge	1
6	What are basics I/O?	Knowledge	1
7	What are I/O subsystems?	Knowledge	1
8.	Define tasks and assign the task priority	Understand	1
9.	Define Dead lock ?	Understand	1
10.	Describe hard vs soft real time systems	Understand	4

	Group - B (Long Answer Questions)		
S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	Define scheduler. Explain any scheduling algorithm.	Create	3
2	Define Semaphore. Explain the uses of Semaphore.	Knowledge	3

3	Explain the following (i) Dead lock	Understand	3
4	Explain the following (i) Recursive locking (ii)Pipe states	Understand	3
5	Define the table for kernel services in an operating system with functions and actions.	Understand	3
6	Differentiate process and thread and and define task and explain with diagram all the five states of task	Knowledge	2
7	Explain the creation and activation of a task by task spawn function in VxWorks. For task priority function, Define 3 options on spawning.	Understand	2
8	Explain the event registers and signals with examples	Understand	5
9	Explain the basics I/O concepts with examples	Knowledge	5
10.	Explain the I/O subsystem with RTOS examples	Understand	5

Unit-IV		
EXCEPTIONS, INTERRUPTS AND TIMERS		
Group – A (Short Answer Questions)		

S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	What are Exceptions?	Knowledge	1
2	What are interrupts?	Knowledge	1
3	What are the applications of interrupts?	Understand	1
4	What is spurious interrupts ?	Understand	1
5	What is real time clock?	Knowledge	1
6	What is a programmable timers?	Understand	1
7	What are timer interrupts?	Understand	1
8	What are soft timers?	Knowledge	1
9	What is interrupt timer routines ?	Knowledge	1
10	What are the timer operations?	Knowledge	1

Group – B (Long Answer Questions)		

S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	What are exceptions and interrupts? Explain the applications of exceptions and interrupts.	Knowledge	2
2	Explain the steps in servicing the timer interrupt	Understand	2

S. No	Questions	Blooms Taxonomy Level	Course Outcome
3	(a) Explain the following (i) Timing wheels (ii) Nested exceptions	Knowledge	2
4	Write about weighted round-robin approach for scheduling real-time systems with an example	Knowledge	2
5	Explain the Interrupt service routines in an RTOS	Understand	2
6	Explain the exceptions and what is the process of handling exceptions?	Knowledge	2
7	Explain the interrupts, spurious interrupts with examples	Knowledge	5
8.	Explain the real time clocks with examples	Knowledge	5
9	Differentiate the programmable timer interrupts and timer interrupt service routine?	Knowledge	2
10	What are the applications of exceptions and interrupts in RTOS	Knowledge	3

Unit-V
CASE STUDIES OF RTOS

Group – A (Short Answer Questions)

S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	What is RT Linux ?	Understand	4
2	Write about RTOS mCOS –II?	Knowledge	4
3	Write about Micro C/OS-II	Knowledge	4
4	What is embedded Linux	Knowledge	4
5	What is the difference between normal OS and tiny OS?	Knowledge	4
6	What are the basic concepts of android OS	Knowledge	4
7	What is the difference between RTOS and android OS	Knowledge	4
8	What is software and hardware architecture of a system	Knowledge	1
9	Examples of vx works	Knowledge	1
10	What is Vx works	Understand	1

Group – B (Long Answer Questions)

S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	What are the important features of Vx Works for a sophisticated RTOS	Knowledge	2
2	Define porting of RT Linux .Discuss general requirements of processor to port RT Linux along with hardware/software architecture	Knowledge	2
3	Explain the following (i) Memory layout in Vx Works (ii) Task Priority levels in Vx Works	Knowledge	2
4	Write and explain the coding for sending application layer byte stream on a TCP/IP network using RTOS Vx works	Understand	2
5	Illustrate the block diagram of Automatic Chocolate Vending Machine System(ACVM)	Knowledge	3

6	Explain all the specifications of Hardware architecture of ACVM system.	Knowledge	2
7	Draw and explain the architecture for Air Traffic Control(ATC).	Understand	2
8	Illustrate two examples for RTOS Image Processing.	Understand	3
9	define porting of RT Linux .Discuss general requirements of processor to port RT Linux along with hardware/software architecture	Understand	5
10	Hardware and software architecture of the system Write the application software for the system	Understand	5

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