Code No: **R42049**   **R10**   **Set No. 1**

IV B.Tech II Semester Regular Examinations, April/May - 2014
REAL TIME OPERATING SYSTEMS
(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering and Electronics & Computer Engineering)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1. a) What are the various services offered by Operating System? Explain.
    b) When is an RTOS necessary and when is not necessary in the Embedded Systems? Explain.

2. a) Explain the various RTOS system level functions.
    b) Explain various MUCOS Task service functions and their Exemplary uses.

3. a) Write the important features of RTOS Linux.
    b) Explain any six general shell commands with examples

4. a) "Embedded systems are the most used systems in the area of consumer electronics". Justify.
    b) Describe any case study for MUCOS RTOS.

5. Explain various functions of discrete components of automotives of an integrated central server system.

6. a) Explain *Processor independent code*, and *Processor dependent code* for embedded system of the Operating system.
    b) Explain the process of creating target image for Windows XP Embedded platform.

7. a) Explain the various Features of the Linux Operating system.
    b) Write a Shell script that displays the number of readable, writable, and executable files in a specific directory.

8. a) What is an RTLinux module? Explain in detail.
    b) What is the need for the modification of Linux kernel? Explain.
    c) Explain the Compiling module and Executing module of RTLinux.

Code No: **R42049**   # R10   Set No. 2

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Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1. a) Explain the three RTOSs for responding to a hardware source call on interrupts.
   b) Explain the three common model strategies that a scheduler may adopt in RTOS.

2. a) Explain various MUCOS Time delay functions for the tasks.
   b) Write various types of Queue functions for the inter task communications of MUCOS.

3. a) Explain any six Linux general file manipulation commands with examples
   b) Write the various standards of OSEK defined standards.

4. Draw and explain basic system of an automatic chocolate vending machine with its ports.

5. Draw and explain the model for an adaptive control algorithm that adopts and functions

6. a) Explain *Processor independent code*, and *Processor dependent code* for embedded system of the Operating system.
   b) Explain the process of porting of RTOS on a custom-built development board.

7. a) Explain any six general Shell Commands with their functions and examples of Linux Operating system.
   b) Write a Shell script to find single letter, two letter, and three letter words in a text file.

8. a) Explain various Thread-related System Calls in RTLinux.
   b) What are the function calls provided for timer management in RTLinux?
   c) What is the need for the modification of Linux kernel to support hard real-time applications? Explain.

Code No: **R42049**   # R10   **Set No. 3**

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Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1. a) List the functions of a kernel. What can be the functions outside the kernel?
    b) Write various activities for implementing OS security issues.

2. a) Write the important features of VxWorks.
    b) Write the various uses of VxWorks.

3. a) Write the important features of RTOS Linux 2.6.x
    b) Write the important features of RTOS Windows CE.

4. Draw and explain basic system of a Digital camera software and hardware architecture.

5. Draw and explain the block diagram of an ACC embedded system in detail.

6. a) Explain the importance of Processor *independent code*, and *Processor dependent code* for embedded system of the Operating system.
    b) Explain the process of porting QNX Neutrino OS on the desktop computers

7. a) Explain any six File Manipulation Commands with their functions and examples of   Linux Operating system.
    b) List the function calls used for the shared memory and message queues.

8. Write a program that illustrates the use of semaphore management function calls in RTLinux

Code No: **R42049**   **R10**   Set No. 4

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Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1. a) List the three ways in which an RTOS handles the ISRs in a multitasking environment.
   b) What is the importance of device management in an OS for an embedded system?

2. a) Explain the important functions of MUCOS.
   b) Explain the important functions of VxWorks.

3. a) Write the important features of RTOS RT Linux
   b) Write the important features of RTOS OSEK.

4. a) Explain with a suitable diagram of subsystem for application transmitting a TCP/IP stack
   b) Draw the model diagram to show how the tasks can be synchronised in TCP/IP network.

5. Draw and explain the ACC system cycle of actions and task scheduling model in detail.

6. a) Why the OS software is not independent of the processor? Explain in detail.
   b) Explain the procedure for porting a RTOS on to a micro-controller based development board.

7. a) Explain any six Directory Commands with their functions and examples of Linux Operating system.
   b) Write a shell script to obtain the word frequency counts in English text sorted in alphabetical order.

8. Write a program that illustrates the use of mutex management function calls in RTLinux.