VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.E. I Year (ECE) II-Semester (Make Up) Examinations, August-2016
(Embedded Systems & VLSI Design)
Embedded Real Time Operating Systems

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 X 2=20 Marks)

1. Draw a typical architecture of Operating System.

2. Define a job, process and task in the context of Operating system.

3. Write in brief about the importance of scheduling algorithm used in RTOs.

4. List out advantages of RMS over EDF.

5. What is the use of PCB?

6. Compare Linux 2.4 and Linux 2.6.

7. Differentiate between Kernel mode and user mode of OS operation.

8. What are Tasklets and where do we use them?

9. Distinguish Linux and RT Linux.

10. List the intertask communication methods in VxWorks.

Part-B (5 × 10 = 50 Marks)

11. a) What is OS and write the importance of OS in Embedded Real-time systems? [4]

    b) Define scheduling. And why is it required in Operating systems? Briefly write about [6] different scheduling algorithms used in ERTOS.

12. a) How does a message queue function works as a method for intertask communication? [5] Explain with an example.

    b) Explain the principle of operation of the EDF algorithm with an example. [5]

13. a) How secured is Linux and what makes it secured when compared to other operating [4] systems?

    b) What is interrupt context and how it is implemented in Linux? [6]

14. a) Discuss the use of Major number and minor number in device drivers. [4]

    b) Classify the device drivers, give one example and write in short about each one of them. [6]

15. a) Discuss about Debugging techniques used to monitor kernel code and to trace errors. [6]

    b) Compare and contrast between the scheduling algorithms of VxWorks, µcos and [4] RTLinux.

16. a) A real-time system consists of three tasks T1, T2, and T3. Their characteristics have [5] been shown in the following table.

Task	Phase (ms)	Execution Time (ms)	Relative Deadline (ms)	Period (ms)
T_1	20	10	20	20
T_2	40	10	50	50
T_3	70	20	80	80

Suppose the tasks are to be scheduled using a table-driven scheduler. Compute the length of time for which the schedules have to be stored in the pre-computed schedule table of the scheduler.

b) A cyclic scheduler is to be used to run the following set of periodic tasks on a uniprocessor: T1 : (e1=1, p1=4), T2 : (e2=2, p2=5), T3 : (e3=1, p3=20), T4 : (e4=2, p4=20). Select an appropriate frame size.   [5]

17. Write short notes on any *two* of the following:

    a) Functions of an RTOS   [5]

    b) mknod and sudo   [5]

    c) Features of µcos   [5]

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