M.Tech. IN ADVANCED INFORMATION TECHNOLOGY – EMBEDDED SYSTEM DESIGN (MTECHSD)

Term-End Examination

00260

December, 2014

MINE-044 : EMBEDDED OPERATING SYSTEM

Time : 3 hours   *Maximum Marks : 100*

Note :

(i) Section I is **compulsory**.

(ii) In Section II, answer any **five** questions.

(iii) Assume suitable data wherever required.

(iv) Draw suitable sketches wherever required.

(v) Italicized figures to the right indicate maximum marks.

SECTION I

1. Compare preemptive and non-preemptive scheduling on the basis of the following points :

    (i)   RAM requirement per task   *10*

    (ii) Task switching mechanism   *10*

    (iii) Deterministic execution time   *10*

SECTION II

2. (a) How does inter-process communication improve response time in applications ? 7

    (b) Why is static linking justified in embedded systems but avoided in desktop computers ? 7

3. (a) Explain the difference in the implementation of device drivers in case of embedded operating system and GNU/Linux. 7

    (b) Explain with the help of an example the utility of FIFO construct in an operating system. 7

4. What is the effect of deadlock in an embedded system ? Explain the utility of the watchdog timer in the event of a deadlock. 14

5. Explain the various services provided by the kernel of an embedded operating system. 14

6. Explain the utility of counting semaphores for buffer management in an embedded operating system. 14

7. (a) Explain with an example how HAL (hardware abstraction layer) helps in porting of embedded software. 7

    (b) What is the requirement of synchronization in embedded systems ? Give examples. 7

8. (a) What is the job of a command shell in an operating system ? 7

(b) How is the concept of command shell utilized in case of embedded systems ? 7