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Seventh Semester B.E. Degree Examination, June/July 2017
Embedded Computing Systems

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. What is an embedded system? Explain the characteristics of embedded computing applications. (06 Marks)
- b. Write a requirement chart for GPS moving map device. (04 Marks)
- c. Define design methodology. Explain with a neat sketch the embedded design process. (10 Marks)
- 2 a. Write a ARM assembly code for the below c- statement $Z = (a \ll 2) | (b \& 15)$. (04 Marks)
- b. With a neat figure explain the ARM programming model. (04 Marks)
- c. With a neat diagram, explain the interrupt mechanism. (06 Marks)
- d. Define address translation. Explain address translation for segment. (06 Marks)
- 3 a. With a neat sketch, explain the bus with a DMA controller. (06 Marks)
- b. Discuss the hardware architecture of a typical PC as a platform. (08 Marks)
- c. Explain the working of keyboard and touch screen I/O devices. (06 Marks)
- 4 a. With a neat diagram, explain program generation from compilation through loading. (08 Marks)
- b. Consider the following C-code statement :

```
if (a + b > 0)
    x = 5;
else x = 7;
```

 - i) Write CDFG for the above C statement
 - ii) Generate the ARM assembly code for the above C statements. (08 Marks)
- c. Explain the different ways of measuring program performance. (04 Marks)

PART – B

- 5 a. With the figure of operating system architecture explain the different kernel services. (10 Marks)
- b. Explain monolithic kernel and micro kernel models with necessary figures. (06 Marks)
- c. Discuss various types of multitasking existing in the operating systems context. (04 Marks)
- 6 a. Define blocking and unblocking communications (04 Marks)
- b. Explain shared memory communication with a neat sketch. (08 Marks)
- c. Discuss message passing and signal interprocess communications. (08 Marks)
- 7 a. With a neat diagram, explain the distributed embedded architecture. (06 Marks)
- b. Discuss the working of Ethernet CSMA/CD algorithm. (08 Marks)
- c. Explain internet service stack with a neat figure. (06 Marks)
- 8 a. What is simulator? Explain the features, advantages and limitations of simulator based debugging. (10 Marks)
- b. With a neat sketch, explain the monitor program based firmware debugging. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.