

UNIVERSITY OF PUNE

[4364]-770

B. E. (Comp Engg) Examination - 2013
Elective II- EMBEDDED SYSTEMS
(2008 Pattern)

[Time : 3 Hours]

[Max. Marks : 100]

[Total No. of Questions : 12]

[Total No. of Printed Pages :2]

Instructions :

- (1) Answer **any three** questions from each section.
- (2) Attempt Section I : Q1 or Q2, Q3 or Q4, Q5 or Q6 and Section II: Q7 or Q8, Q9 or Q10, Q11 or Q12
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary..
- (5) Assume suitable data, if necessary.

SECTION I

- Q1) a) Which characteristics of an Embedded system make it different than a General Purpose system? [6]
- b) Explain how Digital Signal processor and Media processor are different than a general purpose processor. [6]
- c) Discuss various application areas of embedded system. [6]

OR

- Q2) a) Draw a layered architecture of Embedded system. Discuss various components in the Embedded System. [6]
- b) How embedded system are classified depending on complexity? [6]
- c) What challenges are faced while designing an embedded system? [6]
- Q3) a) A robotic control system is to designed. For this application, select the appropriate processor based on: [8]
- i) Instruction cycle time
 - ii) Bus width
 - iii) MIPS
 - iv) On chip cache
 - v) On chip RAM/ROM

- b) Discuss different structural units in a processor in an embedded system. [8]
Mention few advanced units.

OR

- Q4) a) Describe different operating modes of ARM7 processor. [6]
b) What are different ways of reducing power consumption in an embedded system? [6]
c) Discuss various read only memories used in Embedded system. [4]
- Q5) a) Discuss the topology used by devices to communicate through USB protocol. [8]
Mention different types of data transfer.
b) Discuss I²C protocol w.r.t. following points: [8]
i) Data transfer speed
ii) Arbitration
iii) Data frame Format

OR

- Q6) a) Discuss different fields in the data frame of CAN bus protocol. What are the applications of CAN? [8]
b) Which optical devices are commonly used in embedded system? Explain with suitable examples. [8]

SECTION II

- Q7) a) What are the advantages and disadvantages of programming in C++ for Embedded system? [8]
b) Explain the usage of stacks and queues in embedded system programming. [10]

OR

- Q8) a) What is the use of an emulator in embedded system design? Explain with the help of diagram. [10]
b) Enlist the differences between compiler and cross compiler. Explain with uses of source code engineering tools for embedded C/C++. [8]
- Q9) a) Explain the kernel services in an OS. [8]
b) What are the subsystems of an I/O system? Explain. [8]

OR

- Q10) a) How RTOS performs the schedule management of multiple tasks. [8]
b) What are the OS units at an RTOS kernel. [8]
- Q11) a) Explain three ways in which RTOS handles the ISRs. [8]
b) Enlist the software and hardware requirements of digital camera. [8]

OR

- Q12) a) Identify the requirements of s/w mobile phone and show it with the help of class diagram. [4]
b) Write short notes on any three. [12]
i) μ COS-II ii) Vxworks
iii) Special OS features for automotive systems. iv) Embedded Linux