Q.P.Code: 013691

(3 Hours) **[Total Marks: 80]**

1) Question no. 1 is compulsory
2) Solve any three from the remaining five questions.
3) Assume suitable additional data if necessary.

Q1 Answer the following questions. (20)

a) Justify the need for brown-out detection circuit in embedded systems environment and the mechanism of implementing the same.
b) What is a watch-dog timer, its use and typical application for an embedded system.
c) Explain the structure of typical C source program for ARM based target processor. Typically list the various data types along-with memory size supported by a C compiler.
d) Compare the serial communication protocols RS – 232C and RS – 485 protocols.

Q2 a) Write a note on the interrupt structure of Cortex – M architecture. (10)

b) Explain the utilisation bound in task scheduling in light of Rate Monotonic Scheduling algorithm. (10)

Q3) a) What is a task and various states that a task can lie in for an embedded environment. (10)

b) Explain briefly the register structure of Cortex-M3 architecture along-with the function of various special registers. (10)

Q4 a) Compare the features of Cortex – A8 and Cortex - R4 architectures. (10)

b)Explain the operation and significance of following MicroC/OS – II functions

a) OSSemPend(); & OSSemPost(); b) OSMboxPost(); & OSMboxPend(); (10)

Q5) a)Write a brief note on boundary scan architecture. (10)

b) Explain the various inter- process/task communication and synchronisation tools like semaphores, mutex, mailbox and pipe used by an RTOS environment. (10)

Q6) Write short notes on (Any two) (10 x 2) (20)

a) Problem of priority inversion and mechanism to prevent the same.
b) MSP-430 architecture and its low power capability.
c) Design metrics for a typical embedded system.
