(3Hours) [Total Marks: 80]

N.B.: (1) Attempt any **four** questions out of five questions.

(2) Assume **suitable** data wherever required with justification.

(3) **Figures** to the **right** indicate full marks.

1. (a) Draw and explain with Flow diagram various procedural steps in the process of Embedded systems product design. **10**

(b) State and explain various techniques available for validation of electronic system design with illustrations. **10**

2. (a) Why are there different operating modes in ARM core? Support your answer with ARM core register model with banking concept. **10**

(b) List and give application of different Modes and States of ARM Cortex M3 processor. Give the necessary Mode-State transition Diagram. **10**

3. (a) Compare and contrast non real time OS and RTOS with examples stating additional Requirements of RTOS. **10**

(b) For task scheduling in RTOS, discuss the working of Earliest Deadline First and Rate Monotonic Algorithm. **10**

4. (a) Explain mailbox and pipe method for interprocess communication. Compare these two methods. **10**

(b) Discuss IOT with respect to an application "Soil erosion". Briefly list the interfacing modules which may be required. **10**

5. Briefly explain any two: **20**

(a) Barrel Shifter Utilities with instructions in ARM Core.

(b) Multicore architecture for embedded systems.

(c) Communications security in embedded systems.

****