

B.E. ETRA sem VIII 3M - 2014

Sub - ES & RTP. 3/06/14

QP Code : MV-19363

(3 Hours)

[Total Marks : 100

- N. B. : (1) Question No. 1 is compulsory
(2) Answer **any three** out of remaining questions.
(3) Assume suitable data wherever required.

1. (a) Discuss design metric issues in designing an embedded system. Give suitable example. 5

1. (b) Explain SPI protocol for serial communication. 5

1. (c) Explain Operating modes of ARM7DMI. 5

1. (d) Justify use of C programming for embedded software development. 5

2. (a) Explain data structure Queue, Circular queue, Link list and Array in embedded C programming. 10

2. (b) Explain clock circuit and registers used to control function of clock module of MSP 430. 10

3. (a) Design an embedded system to measure frequency of a power line. Suggest hardware components used. Also give software architecture for the system. 10

3. (b) Write ARM assembly language program to implement

$$\sum_{i=1}^N f_i X_i \text{ for } i = 1 \text{ to } N$$

4. (a) Discuss layered architecture of CAN node. Elaborate Transfer Layer with regards to message framing and arbitration. 10

4. (b) With the help of suitable diagram explain. 10
(i) LCD interface
(ii) Hex Keypad interface

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5. (a) What is bounded and unbounded priority inversion problem? Suggest solutions used for the same. Explain with suitable example. 10

5. (b) For the given task table calculate: (i) Waiting time (ii) Turn around time for earliest deadline first scheduling (EDF). All tasks entered ready queue at same time. 10

Task	Execution	Deadline
T ₁	06	39
T ₂	16	30
T ₃	18	45

6. (a) Describe embedded programming tools like compiler, cross compiler, intergrated development environment, debugging tools, in circuit emulator. 10

6. (b) What is shared data problem? Explain various techniques to over come shared data problem. 10

7. Write short notes on: (Any three). 20

(i) Petrinet Modelling

(ii) Waterfall Model in Embedded Software Development.

✓(iii) Stock implementation in ARM7.

(iv) Techniques used in Interprocess Communication in Embedded System.

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