

Total number of printed pages-3

53 (IT 816) RTES

2015

REAL TIME AND EMBEDDED SYSTEMS

Paper : IT 816

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer **any five** questions.

1. (a) Explain the challenges faced in embedded system design. 10
- (b) Describe with an example the difference between requirement and specification. 10
2. (a) Explain with a diagram architecture of an embedded system. 15
- (b) What are the components of an embedded system? 5

Contd.

3. (a) How real time communication is different from non real time communication? Explain *any one* hard real time communication protocol.

5+5=10

- (b) Say any real time system has the following three periodic tasks:

5+5=10

T1 ($e_1=20$, $p_1=50$, $d_1=35$)

T2 ($e_2=15$, $p_2=100$, $d_2=20$)

T3 ($e_3=25$, $p_3=200$, $d_3=70$)

Schedule the tasks using RMA and EDF.

4. Define distributed embedded system. Describe CAN protocol with a diagram.

3+17=20

5. (a) Show the code for a nested loop to perform an action 10000 time. 5

- (b) Explain with examples 8051 addressing modes. 10

- (c) Find the delay generated by the following delay subroutine, if the system has an 8051 with frequency of 11.0592 MHz.

```

DELAY : MOV R2, # 100
HERE  : MOV R3, # 255
AGAIN : DJNZ R3, AGAIN
       DJNZ R2, HERE
       RET

```

5

6. (a) Write a program to copy 10 *bytes* of data starting at ROM address 400H to RAM locations starting at 30H. 10
- (b) Write a program to get an 8 *bit* binary number from P1, convert it to ASCII, and save the result in RAM location 40H, 41H and 42H. 10