GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Explain the modes of operation of the internal serial communication devices in 8051.   8

   b) What are the uses of timer and counting devices in embedded systems ?   7

8. a) What are the qualities of a good RTOS ?   7

   b) What are the semaphores ? Explain the concept of a binary semaphore.   2 + 6

9. a) Differentiate between an embedded system and a general computing system.   5

   b) Briefly describe various types of pre-emptive scheduling techniques.   10

10. a) What is hardware-software co-design ? Mention the fundamental issues in hardware-software co-design.

    2 + 5

    b) Compare DFG and CDFG models and state their significance in embedded system design.   8

11. Write short notes on any *three* of the following : 3×5

    a) RISC *vs* CISC processors

    b) UML

    c) Bluetooth

    d) Embedded JAVA

    e) Watchdog timer.

7320 (N)   4

CS/B.TECH (ECE-NEW)/SEM-7/EC-704B/2013-14

2013

EMBEDDED SYSTEMS

Time : 3 Hours   Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

Choose the correct alternatives for any *ten* of the following :

$10 \times 1 = 10$

i) How many layers are there in an embedded system design ?

   a) 2   b) 3

   c) 4   d) 5.

ii) Architecture used in 8051 microcontroller is

   a) SIMD   b) Harvard

   c) Von Neumann   d) MISD.

iii) In embedded system design, actuator acts as a/an

   a) Input Device   b) Output Device

   c) Memory Device   d) Both (a) and (b).

7320 (N)   [Turn over

iv) Which one is a serial synchronous communication protocol ?

   a) RS232C   b) PCI

   c) USB   d) I^2C.

v) In distributed embedded controller, which type of bus is used ?

   a) USB bus   b) CAN bus

   c) I^2C bus   d) None of these.

vi) Which of the following is not an embedded system ?

   a) Laptop   b) Washing Machine

   c) Cellular Phone   d) Pacemaker.

vii) Which one of the following is an RTOS ?

   a) Windows NT   b) Unix

   c) Ubuntu   d) Windows CE.

viii) G-Sensor is used to sense

   a) Position   b) Pressure

   c) Acceleration   d) Gravitational Force.

ix) A program that combines object code files into an executable program is called a

   a) Compiler   b) Linker

   c) both (a) and (b)   d) none of these.

x) A robotic arm is a

   a) hard real time system

   b) soft real time system

   c) discreet system

   d) feedback system.

xi) A thread is a

   a) heavy weight process

   b) light weight process

   c) parallel process

   d) none of these.

xii) In UML, Package is a collection of

   a) classes and objects

   b) data elements

   c) abstract data elements

   d) all of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.   3 × 5 = 15

2. Define the term 'embedded system'. What is the purpose of an embedded system ?   2 + 3

3. Explain how UART is used for communication highlighting the advantages of UART.

4. Explain context switching, context saving and context retrieval.

5. With suitable examples explain the differences between 'Hard' and 'Soft' Real Time Systems.

6. State the advantages and disadvantages of programming using C++ in an embedded system.