PSG POLYTECHNIC COLLEGE, COIMBATORE - 641 004

DIPLOMA ODD SEMESTER EXAMINATIONS – OCT 2014

G12502 EMBEDDED SYSTEM

MODEL QUESTION PAPER

Time : 3 Hours   **Max.Marks: 100**

Instructions:

1. **Group A** and **Group B** questions should be answered in the Main Answer book.
2. Answer any **TEN** questions in **Group A**. Each question carries three marks.
3. Answer **ALL** questions either **(a)** subdivision or **(b)** subdivision in **Group B**. Each question carries 14 marks.

Group – A   **Marks: 10 x 3 = 30**

1. State the challenges in designing an embedded system.

2. Can a PC classified as an embedded system? Justify.

3. What is the significance of embedded system in a GPS moving map?

4. Compare RISC and CISC architectures.

5. Draw the format of status register of PIC Microcontroller and brief about fields.

6. List the I/O ports supported by PIC Microcontroller. Mention their functions and alternate functions.

7. How the embedded system protects itself during software malfunctioning?

8. List the sequence of events occurred when hardware interrupt and an interrupt return Raises.

9. State the applications of Serial Peripheral interface.

10. Does 32- Bit ARM processor supports 16-bit operations and 8-bit operations?

11. State reasons for moving from MPU to MMU in ARM.

12. Write the Post condition of the following statements.

    PRE r0=0x00000000

        'r1=0x00000077

        RSB r0, r1, #0

13. Why General purpose OS is not suitable for embedded systems?

14. Draw the state diagram of a Task.

15. List the characteristics of RTOS.

Group– B   **Marks: 5 x 14 = 70**

16. a) Explain the various phases involved in designing embedded system.
(OR)

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　　b) Consider a Temperature monitoring system. The system has to acquire the data. It should alert the user when temperature exceeds the preset value and display status. The cooling system is to be activated when it exceeds preset value. Also the user can modify the reference temperature value through keypad. Draw the functional blocks for the above system and explain.

17. a)   Describe core architectural features of PIC microcontroller.

(OR)

　　b) Harvard architecture increases execution speed of code and data. Comment on this statement. Discuss the organization of program and data memory of PIC microcontrollers with neat schematic diagram.

18. a) Explain the Timer 0 operation with associated registers.

(OR)

　　b) Can a PIC microcontroller communicate to another master to master/slave device? Describe the process with necessary illustrations.

19. a) i) Draw the bit pattern of CPSR and describe.　　　　　　　　　　　　　(5)

　　　　ii) Explain different Register organization available in ARM for various modes of operation　　　　　　　　　　　　　　　　　　　　　　　　　　　(9)

(OR)

　　b) i) How to link ARM and Thumb code together?　　　　　　　　　　　　(5)

　　　　ii) Describe the 3-stage pipeline architecture used in ARM.　　　　　　(9)

20.a) Is kernel an integral part of OS? Draw the kernel structure and describe the role of scheduler and dispatcher.

(OR)

　　b) With an example explain scheduling of tasks using robin round method.

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