

Total No. of Questions : 10]

SEAT No. :

**P2384**

**[4758] - 542**

[Total No. of Pages :3

**T.E. (E & TC)**

**EMBEDDED PROCESSORS**

**(2012 Pattern) (End-Sem.) (Semester -II) (304191)**

*Time :3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 4) *Assume suitable data, if necessary.*

- Q1)** a) What is the function of Barrel shifter in ARM data flow model. [2]
- b) What is the significance of special purpose registers  $r_{13}$ ,  $r_{14}$  and  $r_{15}$ . [3]
- c) Compare ARM 7, ARM 9, ARM 11. [5]

OR

- Q2)** a) Write a program for on chip ADC for LPC 2148. [6]
- b) List the features of UART0? Compare it with UAR 11. [4]

- Q3)** a) Draw and explain interfacing diagram of I2C EEPROM to LPC 2148. [4]
- b) Draw and explain block diagram of LPC 2148. [6]

OR

- Q4)** a) Draw and explain CPSR register structure of LPC 2148. [4]
- b) Explain the following instructions with example. [6]
- i) SWP  $R_0, R_1$
  - ii) MUL  $R_1, R_2, R_3$
  - iii) LDR  $R_2, [R_3]!$

**P.T.O.**

- Q5) a)** Draw and explain CMSIS structure of cortex series. [8]
- b) Draw and explain interfacing diagram of 7 segment display with LPC1768. Draw flow chart. [8]

OR

- Q6) a)** Compare ARM7 with CORTEX M series. [4]
- b) What is need of operating system in ES? Explain desired features of OS for complex embedded system design. [6]
- c) Draw & explain with algorithm interfacing diagram for RGB LEDs with LPC 1768. [6]

- Q7) a)** What is PWM? Write a embedded C program to drive DC motor using PWM for LPC 1768. [8]
- b) Explain the role of following registers in LPC 1768. [8]
- i) Direction registers
  - ii) SET Registers
  - iii) Clear Registers
  - iv) Mask registers

OR

- Q8) a)** Draw and explain block diagram of LPC 1768 in detail. [8]
- b) Draw and explain power control block of LPC 1768 and explain various power saving modes. [8]

- Q9)** a) Draw and explain clock control block of LPC 1768 in details. [9]
- b) Explain the following blocks of LPC 1768. [9]
- i) NVIC (Nested Vector Interrupt Controller)
  - ii) MPU (Memory Protection Unit)

OR

- Q10)** Write short note on [18]
- a) Ethernet (Features, Frame structures etc)
  - b) CAN Protocol (Features, Block diag, applications, etc)
  - c) USB (Features, frame structures, etc)

