

Total No. of Questions :10]

SEAT No. :

**P1733**

[Total No. of Pages :3

**[5058] - 367**

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

**EMBEDDED PROCESSORS**

**(2012 Course) (Semester - II) (End Semester) (304191)**

*Time : 2½ Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

- 1) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

**Q1) a) State & explain different operating modes of ARM7. [6]**

b) Draw interfacing diagram to interface LED bank to port pins p 0.0 - p 0.3 of LPC2148. Write down the algorithm to blink the LEDs. [4]

OR

**Q2) a) What is the need of Pin connect Block in LPC 2148? Explain the role of PINSELX registers. [6]**

b) Explain the following ARM instructions (any two) [4]

i) MLA R<sub>0</sub>, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>

ii) MVN R<sub>2</sub>, R<sub>3</sub>, ASR # 2

iii) STR R<sub>0</sub>, [R<sub>1</sub>,# 4]

iv) ANDS r<sub>0</sub>, r<sub>1</sub>, r<sub>2</sub>

**Q3) a) Explain the architecture of LPC 2148 with a neat block diagram. [8]**

b) Compare I<sub>2</sub>C & SPI protocol. [2]

OR

**P.T.O.**

**Q4)** a) Enlist the features of on-chip ADC in LPC 2148. Explain ADOGDR register. [6]

b) Draw and explain the interfacing diagram of SD card with LPC 2148. [4]

**Q5)** a) Compare cortex - A, cortex - R, cortex - M series processor. [8]

b) Enlist need and desired features of operating system in developing complex applications in embedded system. [8]

OR

**Q6)** a) Draw and explain CMSIS standard for firmware development in ARM cortex based system. [6]

b) Discuss various cortex M3 based controllers. [4]

c) Compare cortex processors over ARM7 for embedded system design. [6]

**Q7)** a) Draw & explain architecture of LPC 1768. [10]

b) Explain four reset sources under system control block of LPC 1768 in detail. [8]

OR

**Q8)** a) Draw interfacing diagram of motor control using PWM with LPC 1768 & write down the algorithm to control the speed of the motor. [8]

b) Explain three clock sources (oscillators) for LPC 1768. [6]

c) Describe any two registers with reference to LPC 1768. [4]

i) FIOMASK

ii) FIOPIN

iii) FIOSET

iv) FIODIR

**Q9) a)** Explain CAN protocol and frame structure with reference to ARM M3 (LPC 1768). **[8]**

b) Explain the architecture & operation of Ethernet bus with reference to ARM CORTEX M3 (LPC 1768). **[8]**

OR

**Q10)a)** With respect to USB controller in LPC 1768 explain. **[8]**

i) Features to USB 2.0

ii) Frame structure

b) How in & out data transactions take place in USB? Give operational overview. **[8]**

