

Total No. of Questions :10]

SEAT No. :

**P2859**

**[4958]-1047**

[Total No. of Pages :3

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

**EMBEDDED PROCESSORS**

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

*Time : 3 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 and 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) Explain programmer's model of ARM processor. [6]**

b) Draw interfacing diagram to interface LED bank to port pins P 0.12 to P 0.15 of LPC 2148. State algorithm to blink the LEDs. [4]

OR

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

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

i) ADDEQ R<sub>0</sub>, R<sub>1</sub>, R<sub>2</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 SPI protocol with suitable diagram. [6]**

b) What is meant by TDMI with respect to ARM 7 core. Compare THUMB and ARM instruction set. [4]

OR

**P.T.O.**

- Q4)** a) Explain the following bits in ADOCR register. [6]  
i) SEL.  
ii) CLKDIV.  
iii) CLKS.  
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 systems in developing complex applications in Embedded system. [8]

OR

- Q6)** a) Explain CMSIS standard for firm wave development in ARM cortex based system. [6]  
b) Compare Cortex processors over ARM 7 for embedded system design. [6]  
c) Why Nested vector Interrupt controller is necessary in ARM cortex? [4]

- Q7)** a) Explain four reset sources under system control block of LPC 1768 in detail. [8]  
b) Explain the following power saving modes. [Any three]. [6]  
i) Sleep mode.  
ii) Deep sleep mode.  
iii) Power down mode.  
iv) Deep power-down mode.  
c) Explain significance of PLL0 and PLL1 in LPC 1768. [4]

OR

- Q8)** a) Draw interfacing diagram of motor control using PWM with LPC 1768. & write down algorithm to control the speed of motor. [8]
- b) Explain three clock sources (oscillators) for LPC 1768. [6]
- c) Describe any two registers with reference to ARM M3 micro controllers (LPC 1768). [4]
- i) FIOMASK.
  - ii) FIOPIN.
  - iii) FIOSET.
  - iv) FIODIR.
- Q9)** a) Explain the CAN protocol and frame structure with reference to ARM M3 microcontroller. [8]
- b) Explain the following with respect to USB controller in LPC 1768. [8]
- i) Features of USB.
  - ii) USB frame structure.

OR

- Q10)**a) Explain the architecture and operation of Ethernet bus with reference to ARM M3 microcontroller. [8]
- b) How in and out data transactions take place in USB? Give operational overview. [8]

