Q.P. Code : 10575

[Time: 2½ Hours] **[Marks:60]**

Please check whether you have got the right question paper.

N.B:
1. **All** questions are **compulsory**.
2. **Figures** to the **right** indicate **full** marks
3. **Symbols** have their usual **meanings** unless otherwise **stated.**
4. Use of **log tables/ non-programmable** calculator is **allowed**.

1. (a) Attempt any **one**: **8**
   (i) Discuss the program memory and Data Memory organization in the case of PIC 16F877 chip.
   (ii) With the suitable diagrams explain how the Compare and Pulse Width Modulation Mode is implemented in 16F877 chip.
   (b) Attempt any **one**: **4**
   (i) Explain with the help of a neat diagram Indirect mode of addressing in 16F877 microcontroller.
   (ii) Discuss any four salient features of PIC 16F8XX family.

2. (a) Attempt any **one**: **8**
   (i) With the help of a circuit diagram explain how you will interface a 16 key Keypad to a microcontroller. Explain the Logic used to identify the key depression.
   (ii) Draw a circuit diagram to interface Atmel 89C51 with DAC 0809 and explain its working in brief.
   (b) Attempt any **one**:- **4**
   (i) Explain how you can interface 7 Segment Display to PIC chip.
   (ii) What is PWM? How this signal can be used of DC motors?

3. (a) Attempt any **one**:- **8**
   (i) Draw the Core Block diagram of ARM7TDMI.
   (ii) Explain the various blocks and their functions involved during each pipeline stage of ARM7TDMI.
   (b) Attempt any **one**:- **4**
   (i) Write a note on the Condition Code Flags of the CPSR.
   (ii) Write a note on the Users registers in the THUMB mode.

4. (a) Attempt any **one**:- **8**
   (i) Explain the following ARM7 instructions with examples:
   (1) STMEA sp!,{r0, r1, r3-r5} (2) TEQ r1, r2
   (3) BL (4) MULS r0, r2, r2
   (ii) Explain the following THUMB instructions with examples:
   (1) ROR r1, r0 (2) ADD r1, #255
   (3) MUL r0, r7 (4) LSR r0, r1

Turn Over

(b) Attempt any **one**:- **4**

(i) Fifty, 32-bit data are stored in consecutive memory locations starting from 0010H. Write an Assembly Language Program in ARM7 to transfer these blocks of 32-bit data to a new memory location beginning from 0100H.

(ii) Two, 64-bit nos. are stored in consecutive memory locations starting from offset 0050H. Write an Assembly Language Program in ARM7 to subtract the second number from the first. Store the result in consecutive memory locations.

5. Attempt any **four**:- **12**

(a) Describe the PORTB in case of 16F877.

(b) Give the function of OPTION_REG Register in 16F8XX.

(c) How will you interface a relay and LED to the microcontroller chip?

(d) Draw a circuit diagram to interface LCD module to the PIC chip.

(e) Write down the Exception priorities.

(f) Write an assembly language program in ARM7 to disable the IRQ bit (Interrupt Bit) in the CPSR.

(g) InARM7TDMI there are two separate data lines (unidirectional as well as bidirectional); why?

(h) Write a short note on the two internal clock phases of the clock pulse.