

#### 7.4 What are there two different registers (MAR and MDR) associated with memory?

Sol: Two registers, the memory address register (MAR) and the memory data register (MDR), act as an interface between the CPU and memory. The MDR holds a data value that is being stored to or retrieved from the memory location currently addressed by the MAR. The MAR holds the address in the memory that is to be opened for data. The MAR is connected to a decoder that interprets the address and activates a single address line into the memory.

7.12 The Little Prince Computer (LPC) is a mutant variation on the LMC. The LPC is so named because the differences are a royal plan). The LPC has one additional instruction. The extra instruction requires two consecutive words:

0XX

0YY

This instruction, known as move, moves data directly from location XX to location YY without affecting the value in the accumulator. To execute this instruction, the Little Prince would need to store the XX data temporarily. He can do this by writing the value on a piece of paper and holding it until he retrieves the second address. The equivalent in a real CPU might be called the intermediate address register, or IAR. Write the fetch-execute cycle for the LPC MOVE instruction.

Sol:

