National University of Computer and Emerging Sciences



Assignment 05

COAL

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| Semester | Fall 2020 |

# Direct Memory Access (DMA)

It transfers data between memory and Device of the system without processor participation.

DMA Controller:

The Unit that controls DMA Working.

# Modes in Data transfer:

# Burst Mode:

DMA gains the charge of system Bus and then release system bus only after completion of data transfer.

# Cycling Stealing Mode:

In this Mode, DMA cause CPU to stop its Operation and give control of bus to DMA controller for short time. After transfer of every byte, DMA release bus and then request bus system bus again.

# Transparent Mode:

DMA only take charge of system bus when processor does not require system bus.

# Working:

Those Device wants to transfer the data to or from Memory. It sends Request to DMA controller. DMA controllers accept this request and asks for CPU and send it to Hold Request. CPU receives This Request from DMA controller and Send Hold Acknowledgement to DMA. After Receiving, DMA controller use these Devices that transfer data. DMA controllers take system bus and transfer data to or from Memory. When data has completely transfer, DMA has interrupted to know is processor data transferring is finished or not, Processor can take control over the bus and started processing again.

# BLOCK DIAGRAM:

Data Lines

Address Lines

Read Acknowledgement

DMA request Interrupt

Write

# EXPALINATION OF BLOCK DIAGRAM:

First check data must be read or write to or from memory. It Passes Information via read /write control lines between Processor and DMA. Processor also provides starting address of the data block in memory, from where data Block in Memory must be read or where the data block has written in memory. DMA store it in address register. Processors send the word count (How many words are written /read). It stores information into word count register. All data from address devices is read or write into Data Registers.