Operating Systems
Device Controller:
=> A general purpose computer system consists of CPUs and multiple device controllers that are connected through a common bus.
=) Device controller maintains weal buffer storage and set of special purpose registers.
=) Device controllers help in providing access to the shared memory.  Disks Mouse, keyboard Monitor
CPU Disk USB Video controller adapter
Memory
=> Each device controller is in charge of a specific type of device.

Working of an I/O operation:				
PAGE FING OF AN I O OPERCON.				
1 - 1 - 1 - 1				
Thread of C		10/18/19		
execution a instruction				
h cycle	Instructions			
CPU e data	and Data			
movement	, , , , , , , , , , , , , , , , , , ,			
1/0 data interrupt	Memory			
request	3			
DMA		Assert and American and American American American		
Device				
	7			
=> To start an I/O operation, the device driver				
roads the appropriate registers within the device				
controller.				
=) The device controller, in turn, examines the contents				
of these registers to determine what action to				
take.				
CEPE				
=) The controller starts the transfer of data				
from the device to its local buffer.				
Hom the activity				
y transfer of data is complete.				
=) Once the transfer of data is complete,				
the device controller informs the device driver.				
via an interrupt that it has finished its oper-				
ation.				
=) The device driver then returns control to the				
operating system.				

=) This form of interrupt-driven I/O is fine			
for moving small amounts of data but			
can produce high overhead when used for bulk			
can produce high overhead when asea is			
data movement as cru will be frequently			
disturbed due to calling of interrupts.			
1. A. A.			
=) In order to remove the above problem, Direct			
Memory Access (DMA) is used.			
=> After setting up buffers pointers and counters			
for the I/O device the device controller transfers			
an entire block of data directly to or from			
=> After setting up buffers, pointers and counters for the I/O device, the device controller transfers an entire block of data directly to or from its own buffer storage to memory, with no intervention by the CPU.			
intervention by the CPII.			
The contract of the crain			
Dual Mode:			
=> In the hardware level, instructions are executed			
in 2 different modes (Dual mode operations):-			
O User mode Non-privileged mode			
2) kernel mode   Privileged mode			
=) Kernel mode is represented by mode bit 0			
while User mode is represented by made bit			
1 1.			
=) The dual mode operation is used in order			
to provide protection and security to user			
program.			
L.o.J.w.			

=) It is purely decision of OS in which			
=) It is purely decision of US			
particular moderns			
Drivilleged instructions are executed in vernel mode and non-privileged instructions are executed in			
or reged instructions are executed in			
and non-primiteged inscreens			
user made			
exparticular mode current instructions are executing.			
=> 1 viode bit is used to instructions are executing.			
particular mode current instructions			
> Operating system always runs in kernel mode			
Perating system aways mis			
(Default).			
and an alumus streets in			
=) In booting time, system always starts in			
kernel modé.			
instructions:			
Some of the privileged instructions:-			
D I/O operations			
2) context switching			
3) Disabling the intempts			
advilaged instructions:			
=) Some of the non-privileged instructions:-			
O reading time of clock			
(2) reading status of the printer.  (3) sending final print output to printer.			