

"Assignment # 2"

BSSFE23058
Section A.

Information Technology University ICT.

Q1 A Real-time Operating System is designed to manage and control the execution of tasks in a manner that meets specific timing constraints. It is needed to run real time applications; it may support multiple simultaneous tasks or it may only support single tasking. They are built to run real-time applications that respond to certain inputs extremely quickly in milli or microseconds. Real-time applications are needed to run industrial systems and life-support systems.

Q2

$$(4310)_5$$

$$0 \times 5^0 = 0$$

$$1 \times 5^1 = 5$$

$$3 \times 5^2 = 75$$

$$4 \times 5^3 = 500$$

$$0 + 5 + 75 + 500 = 580$$

$$(198)_{12}$$

$$8 \times 12^0 = 8$$

$$9 \times 12^1 = 108$$

$$1 \times 12^2 = 144$$

$$8 + 108 + 144 = 260$$

$$(4310)_5 = (580)_{10}$$

$$(198)_{12} = (260)_{10}$$

Q3 a. $(00110111)_2$

0011	0111
$0 + 0 + 2^1 + 2^0$	$0 + 2^2 + 2^1 + 2^0$
$2 + 1$	$4 + 2 + 1$
3	7
$(37)_{16}$	

Q4

$(DF3)_{16}$

D	F	3
13	15	3
$2^3 + 2^2 + 0 + 2^0$	$2^3 + 2^2 + 2^1 + 2^0$	$0 \cdot 2^3 + 2^2 + 2^0$
1101	1111	0011

$$(DF3)_{16} = (11011110011)_2$$

Q5

A router is a complicated device that stores the routing information for networks. A router looks at each packet's header to determine where the packet should go and then determines the best route for the packet to take towards its destination. A router will not allow broadcast traffic to cross the device unless modified to do so. Thus, a packet must be addressed to a specifically identified destination to pass through the router. A router is connected to at least two networks. They are located at gateways, whereas a switch is a device that learns which machine is connected to its port by using the PC, printer, or other devices' IP address. A switch substantially reduces the amount of broadcast traffic and is ~~currently~~ the network topology switches are employed within the LAN to provide efficient and fast communication between devices connected to the same network segment. ^{whereas} Routers are used to connect it to external networks like the internet and route traffic between different LANs. Routers are primarily responsible for interconnecting networks and making decisions about how to route data between them, whereas switches facilitate local network communication by forwarding data within a single network.