**TUTE WEEK2**

Q1.1) Confidentiality, Integrity, Availability (CIA)

Q1.2) Security policy is a top level explicit expectation or guide on how the security will be maintained in the company (ie what is most important, vague info) whilst controls are the way these policies can be implemented.

Policy says what, Controls say how

Q1.3)a) Confidentiality of data, Integrity of data in the system, Availability of the website all three are hit

Mosty I and A

b)Confidentiality and integrity only… but some data is gone so availability lost to those data, unless backup

c)Availability

Q2.1)a) deterministic delay---predictable delay……….TSN (Industrial) or Ethernet or xDSL

Or even 4G or 5G networks useful

b) high bit rate ++ deterministic delay (as industry process) ……… So 4G or 5G or fibre optic useful

Q2.2) Maybe we can identify them in terms of topological location, Medium used, ~~Ownership,~~ Coverage, ~~Capacity, and purpose~~ **+packet or frame or circuit switched + IP or UDP vs TCP (connection vs connectionless)**

Q2.3)a) 5G NR are devided into 3 areas depending on use case: eMBB as evolution of LTE, mMTC for IOT, URLLC for bandwidth in 30+ GHz range. It has been built on previous LTE/EPC framework and will use several numbers of short range base stations to make 20 or 30 times more bandwidth available with lower latency. But it has needs development of a complex front and back haul network (new network architecture) and still isn’t clear about its scalability potential for the huge number of IOT devices. Network slicing—multiple virtual network stuff

b)WLAN used IEEE802.11 defined protocols with common MAC layer but variable physical layer. It operated in the ISM band (which has minimal restrictions) and takes advantage of development in transmitter receiver (MIMO). It can be interfered with by using nearby Bluetooth communication, cordless telephones, microwave oven, etc. It needs good, separate authentication added to it to make it more secure (like WPA1 or 2, encryption, authentication, etc.). High data rate, short range

Q2.4) DNS maps Domain names to IP address (ie people only need to type name to find website instead of trying to remember their IP address which continuously changes), even for cloud servers. It has privacy issue where govt can use meta data to track who made requests to which websites and when.

DHCP uses DORA protocol to help client lease their IP address automatically

***Question 3 very important for quiz***

Q3.1) It is the method TCP uses to set up a connection between two computer before passing Data between them, ensuring that the two computers are active and ready to communicate. UDP doesn’t have anything like that as it is connectionless and sends data directly to destination whenever it receives it.

Q3.2)Throughput in measured in amount of data delivered over a communication channel. So if delay increases, throughput will be decreased as its longer for the same amount of data to reach the other end. If its delayed for too long and exceed the timeout threshold, the packet might be dropped altogether (assuming congestion). This will cause the source to even retransmit the information.

Q3.3)Wireless communication can have several UDP communications utilizing it, which can force out TCP connections due to TCP’s flow control mechanism

Q3.4) step1: Host A sends a SYN massage with ISN 2500 (to let B know that A wants to communicate)

Step2: Host B sees the SYN and send an ACK with ISN 2501 and also its own SYN with ISN 3400 (to let A know that B wants to communicate)

Step3: Host A sees the SYN of ISN 3400 and ACK of ISN 2501 and realizes Host B is ready to communicate. It also responds back to B with an ACK with ISN 3401 to let B know that A is ready for communication.

After this, handshake has been completed and thus its time to transfer the data

Q3.5)Size of each data segment (including header size) is 1500 and TCP window size is 4500 ( as it sent 3 packets of 1500 data before starting to wait for ACK)