ICT 4010
Test 1 (2022)

Instructions
You are allowed to use a calculator in this assessment
Duration: 1 hour and 30 minutes Total Marks: 50

1) Regarding the OSI Model, for each of the following OSI Model Layers: give the layer name and describe the function of the layer:
   a. Layer 7 [3]
   b. Layer 6 [3]
   c. Layer 3 [3]
   d. Layer 2 [3]

2) For each of the following OSI Model Layers: state the **data unit** associated to the layer:
   Layer 5, Layer 4 and Layer 2 [3]

3) Name one layer in the OSI Model and one layer in the TCP/IP Model which carry out the same function [1]

4) Explain the difference between bandwidth and throughput [2]

5) You have been given the network address 194.15.0.0 / 28. You are required to provide subnet and IP addressing details based on the given IP address:
   a. Give the subnet mask in decimal form *(start with 255.)* [1]
   b. Indicate the total number of **network bits** that will be in the subnet mask [1]
   c. Indicate the total number of **host bits** that will be in the subnet mask [1]
   d. How many **subnets** can be made from the given network address [3]
   e. What will be the network addresses for the **first 4 subnets** [4]
   f. What will be the broadcast address for subnet #5 [2]
   g. Give two differences between IP addresses' Class B and Class C [2]
   h. Indicate which class the given network address belongs to [1]

   (*Show your working for 5d and 5e)*

6) Regarding computer networks, describe what a Broadcast Domain is [2]

7) Give the **full** names for each of the following radio frequency band abbreviations:
   VLF, HF and SHF [3]

8) Regarding data transmission, resistance is a factor that affects attenuation, describe two other factors which affect attenuation [4]

9) Regarding UTP Cables:
   a. Explain the difference between a Straight-though cable and a Crossover cable [2]
   b. List the 8 wire colors, in order, for a **T568 B** Straight-through cable [2]
   c. Explain the function of a Rollover cable [2]

10) Regarding IP Addresses, explain the difference between an IP address and a MAC address [2]

Total: [50 marks]