1) What is the definition of a network in IT/communication systems?

2) What is a PAN, LAN, MAN & WAN - give an example of where each might be used?

3) Draw a diagram of a LAN with several devices connected to it

4) What is the client-server model - draw a quick diagram demonstrating it

5) What is a thin-client & what is a thick-client - what are some advantages/disadvantages of each?

6) List some advantages and disadvantages for both the client-server and peer-to-peer model

7) What are the 5 requirements for a communication system to function?

8) There are 6 terms you are required to know - they are: simplex, _____ & _____ and unicast, _____ & _____ - give a simple definition of each term

9) List the 4 network topologies required for A-Level and draw a simple diagram of each & try to list at least 2 advantages & disadvantages for each

10) Define the following terms:
Bandwidth:

Attenuation:

Interference:

Channel:

11) Name as many wired and wireless transmission mediums as you can

12) Complete the table:

Type	Advantages	Disadvantages
Coaxial		
Twisted pair		
Fibre optic		
WiFi		
Satellites		

13) A company has a site spanning 4km^2 - they have 4 buildings (office, factory, distribution center, research), each about 500m apart - in each building, they might have multiple networks, but a network will never have more than 10 computers - in total, the company has about 500 computers - suggest & justify a topology/ies they could use as well as an/some appropriate transmission medium(s)

14) Complete the following table:

Device	Purpose
Terminator	

Repeater	
Router	
Wireless Access Point (WAP)	
Hub	
Switch	
Bridge	
Gateway	
Network Interface Controller/Card (NIC)	
Wireless Network Interface Controller/Card (WNIC)	

15) A typical home router performs the features of/contains many of these devices listed above - which devices are they? And why is a home router multi-functional?

16) What is the advantage of a switch compared to a hub? What advantage(s) does this have for the network?

17) What is a collision - can they occur on the star or mesh topologies - why or why not?

18) How does CSMA/CD (Carrier Sense Multiple Access with Collision Detection) handle collisions on a bus topology?

19) 5G uses …… frequency waves than 4G. This means the bandwidth is …… . 5G is …… at going through walls and has a ……. rate of attenuation.

20) State the advantages/disadvantages for both wired & wireless communication.

21) Define the terms:

WWW:

Internet:

ISP:

22) What are the 3 tiers of ISPs - how does the area they cover differ?

23) What is a buffer and why do network devices - routers, (W)NICs, switches etc need them?

24) Explain the basic operation of circuit switching and packet-switching approaches for transmitting data - what are the advantages/disadvantages of each?

25) What is/was the PSTN (Public Switched Telephone Network) system and why were 'leased lines' sometimes required?

26) What is cloud computing & what is the difference between a private & public cloud? What would be the advantages/disadvantages of public vs private clouds?

27) What kinds of services might a cloud company provide (hint: IaaS, PaaS & SaaS)

28) What is a routing table and why is it needed to correctly route packets to their destinations?

29) What is bit-streaming and what are the differences between on-demand and realtime bit-streaming?

30) What are the high and low watermark levels in bit streaming?

31) How many IP addresses are available in IPv4 - why is this a problem?

32) Explain the similarities and differences between IPv4 and IPv6 formats

33) Write whether the following IP addresses are valid or invalid - give a reason if invalid:

192.168.0.1
50.256.48.14
70.25.1.5.12
2001:DB8:3333::ADBE:7777:8888
::
2001:db8::123.123.123.123
1234:5678:9876:ABCD:DEFE:1357:2468
AAAA:BBBB::1111.222

34) What are 3 approaches used to alleviate the IPv4 shortage?

35) List 3 benefits of splitting a network into subnets

36) What is a subnet mask - explain what a subnet mask of 255.255.255.0 means for an IPv4 address of 200.150.100.1. How many devices would be able to be on this network?

37) What is Network Address Translation (NAT)?

38) Explain the difference between static & dynamic IP addresses - what are the advantages/disadvantages of each?

39) Explain the difference between public & private IP addresses - what are the advantages/disadvantages of each?

40) What is DHCP and how does the DHCP lease work?

41) Explain what DNS is used for and how it works

42) Why is it important for DNS records to be cached - what could be a problem of the records being cached too long however?