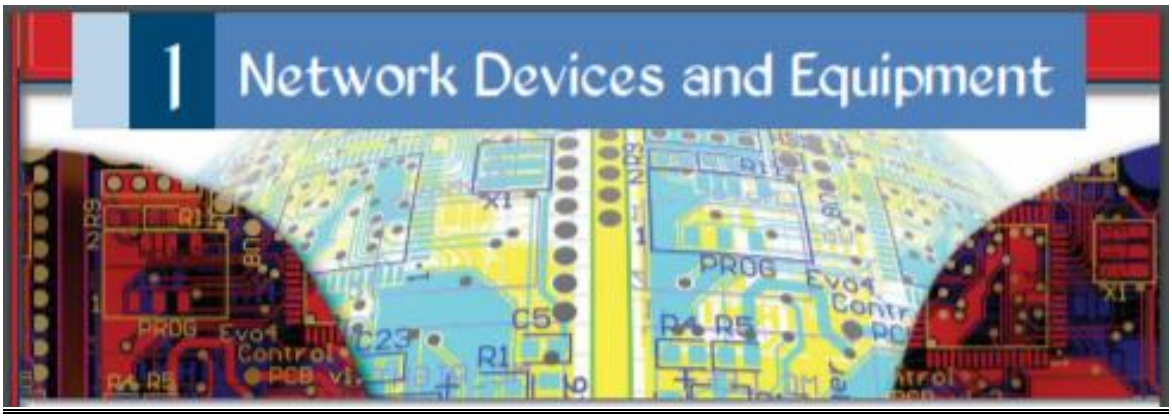
ANSWER KEY



1. Do you know the answers to the following questions? Work in groups and try to answer as many as you can (you may use Greek language too). Then, read the text and come back to check or complement your answers.

(suggested answers)

1. What do ***network devices*** do? What are they used for?
   Network devices are used to combine, split, switch, boost or direct packets of information along a computer or telecommunications network.
2. What does ***network equipment*** include? Name specific devices.
   This product area includes hubs, switches, routers, bridges, gateways, multiplexers, transceivers and firewalls.
3. What is the difference between ***wired*** and ***wireless*** networks?
   In wireless networks, devices communicate via radio waves and do not require physical connections whereas in wired networks, cables are used.
4. Why are ***protocols*** regarded to be fundamental mechanisms for network communications? What do they do?
   Network protocols specify the software attributes of data communications, including the structure of packets and the information contained therein. Network protocols may also prescribe some or all of the operational characteristics of the network hardware on which they run.
5. What are the main kinds of ***area*** networks?
   Local area networks (LAN), metropolitan area networks (MAN), wide area networks (WAN).
6. What is a network ***hub*** used for? What are its drawbacks?
   It is a networking device used to connect multiple network hosts as well as to do data transfer. The data is transferred in terms of packets on a computer network. So when a host sends a data packet to a network hub, the hub copies the data packet to all of its ports connected to. However, because of its working mechanism, a hub is not so secure and safe. Moreover, copying the data packets on all the interfaces or ports makes it slower and more congested which led to the use of network switch.
7. What is a network ***switch*** used for? What is its advantage in comparison with a network hub?

Like a hub, a switch works at the layer of LAN (Local Area Network). While hub just does the work of data forwarding, a switch does 'filter and forwarding' which is a more intelligent way of dealing with the data packets. So, when a packet is received at one of the interfaces of the switch, it filters the packet and sends it only to the interface of the intended receiver. For this purpose, a switch also maintains a CAM (Content Addressable Memory) table and has its own system configuration and memory.

8. What does a ***modem*** do?
   A modem, which stands for Modulator + Demodulator, is a hardware device that allows a computer to send and receive data over a telephone line or a cable or satellite connection. In the case of transmission over an analog telephone line, the modem converts data between analog and digital formats in real time for two-way network communication. In the case of the high-speed digital modems popular today, the signal is much simpler and doesn't require the analog-to-digital conversion.
9. What does a ***router*** do?
   A router, which is a protocol-dependent device, is a physical layer networking device that joins multiple networks together. Typically, routers are designed to make decisions about which path or interface to use for network traffic. Generally, they perform very little filtering or policing, instead they are optimized for speed.
10. What does a ***repeater*** do?
    A repeater is an electronic device that amplifies the signal it receives. When it receives a signal, it retransmits it at a higher level or higher power so that it can cover longer distances. Repeaters use regeneration and retiming to ensure then that signals are transmitted clearly through all network segments.

3. Read the following text to get the information you need for the previous activity and then do the tasks below.

1. Blocks, cells, frames or segments are all packets of information or data. **TRUE** *(…Depending upon the type of network, packets may be called blocks, cells, frames or segments)*
2. 'Network protocols' are layers of a computer network with specified purpose. **FALSE** (*These different layers are like different zones of a computer network with <u>specified works, also called 'network protocols')</u>*
3. A hub just connects network hosts without being able to transfer data. **FALSE**
   (… a networking device used to connect multiple network hosts as well as to do data transfer)
4. A switch maintains a Content Addressable Memory table and has its own system configuration and memory in order to be able to send packets to the intended receiver only. **TRUE**
   (So, when a packet is received at one of the interfaces of the switch, it filters the packet and sends it only to the interface of the intended receiver. For this purpose, a switch also maintains a CAM table and has its own system configuration and memory.)
5. Transmission over an analog telephone line is nowadays the most popular way to access the internet. **FALSE**

(In the case of transmission over an analog telephone line, which was once the most popular way to access the internet ….)

4. Read the text carefully and then choose the correct answers.

1. c 2. a 3. b

5. Match the words (1-10) with the definitions (A-J).

1. F	**2. G**	**3. H**	**4. I**	**5. B**	**6. J**	**7. C**	**8. A**	**9.D**	**10. E**

6.Choose the answer (a, b, or c) you find most appropriate.

1. interface	2. transceiver	3. LAN	4. analog	5. protocol	6. Repeaters

7. Complete each blank in the following pairs of sentences with the correct word.

1. a. device	2. a. hub	3. a. configuration
1. b. equipment	2. b. router	3. b. interface

8. Complete the sentences using the correct noun from the verbs in parentheses.

1. router / resistance	2. improvement	3. conversion / transference	4. breakage
5. user/printer/ server	6. difference / directory/folder	7. hacker / information	8. directory/location

9. The following sentences appear in the text about network devices and equipment. Underline the modal verbs and match them with their functions below.

a. When it receives a signal, it retransmits it at a higher level or higher power so that it can cover longer distances: **2. ability**

b. Depending upon the type of network, packets may be called blocks, cells, frames or segments:**3 possibility**

c. They should be used to interconnect local or remote networks in order to centralize network administration: **5 advice**

10. Complete the sentences in the following router user guide choosing the correct item and providing justifications for your answers.

1. may	2. will be able to	3. should not	4. can
5. may	6. should	7. must have	8. don't need to

11. Complete the sentences in the following guide with the correct modal verb in the right form.

1. can	2. may	3. should	4. have to
5. are able to	6. might	7. should	8. can
9. should	10. may	11. might	12 may not have
13. don't have to be			

12. Match the verbs in bold to their meanings.

1. e	**2. c**	**3. f**	**4. g**	**5. b**	**6. a**	**7. d**

13. Choose the most appropriate title for the talk.

b. Predicting the future of the World Wide Web.

Transcript: https://www.ted.com/talks/kevin_kelly_on_the_next_5_000_days_of_the_web

0:12
The Internet, the Web as we know it, the kind of Web -- the things we're all talking about -- is already less than 5,000 days old. So all of the things that we've seen come about, starting, say, with satellite images of the whole Earth, which we couldn't even imagine happening before, all these things rolling into our lives, just this abundance of things that are right before us, sitting in front of our laptop, or our desktop. This kind of cornucopia of stuff just coming and never ending is amazing, and we're not amazed. It's really amazing that all this stuff is here. (Laughter) It's in 5,000 days, all this stuff has come. And I know that 10 years ago, if I had told you that this was all coming, you would have said that that's impossible. There's simply no economic model that that would be possible. And if I told you it was all coming for free, you would say, this is simply -- you're dreaming. You're a Californian utopian. You're a wild-eyed optimist. And yet it's here.

1:22
The other thing that we know about it was that 10 years ago, as I looked at what even Wired was talking about, we thought it was going to be TV, but better. That was the model. That was what everybody was suggesting was going to be coming. And it turns out that that's not what it was. First of all, it was impossible, and it's not what it was. And so one of the things that I think we're learning -- if you think about, like, Wikipedia, it's something that was simply impossible. It's impossible in theory, but possible in practice. And if you take all these things that are impossible, I think one of the things that we're learning from this era, from this last decade, is that we have to

get good at believing in the impossible, because we're unprepared for it.

2:05
So, I'm curious about what's going to happen in the next 5,000 days. But if that's happened in the last 5,000 days, what's going to happen in the next 5,000 days? So, I have a kind of a simple story, and it suggests that what we want to think about is this thing that we're making, this thing that has happened in 5,000 days -- that's all these computers, all these handhelds, all these cell phones, all these laptops, all these servers -- basically what we're getting out of all these connections is we're getting one machine. If there is only one machine, and our little handhelds and devices are actually just little windows into those machines, but that we're basically constructing a single, global machine.

2:46
And so I began to think about that. And it turned out that this machine happens to be the most reliable machine that we've ever made. It has not crashed; it's running uninterrupted. And there's almost no other machine that we've ever made that runs the number of hours, the number of days. 5,000 days without interruption -- that's just unbelievable. And of course, the Internet is longer than just 5,000 days; the Web is only 5,000 days. So, I was trying to basically make measurements. What are the dimensions of this machine? And I started off by calculating how many billions of clicks there are all around the globe on all the computers. And there is a 100 billion clicks per day. And there's 55 trillion links between all the Web pages of the world.

3:34
And so I began thinking more about other kinds of dimensions, and I made a quick list. Was it Chris Jordan, the photographer, talking about numbers being so large that they're meaningless? Well, here's a list of them. They're hard to tell, but there's one billion PC chips on the Internet, if you count all the chips in all the computers on the Internet. There's two million emails per second. So it's a very big number. It's just a huge machine, and it uses five percent of the global electricity on the planet. So here's the specifications, just as if you were to make up a spec sheet for it: 170 quadrillion transistors, 55 trillion links, emails running at two megahertz itself, 31 kilohertz text messaging, 246 exabyte storage. That's a big disk. That's a lot of storage, memory. Nine exabyte RAM. And the total traffic on this is running at seven terabytes per second. Brewster was saying the Library of Congress is about twenty terabytes. So every second, half of the Library of Congress is swooshing around in this machine. It's a big machine.

4:40
So I did something else. I figured out 100 billion clicks per day, 55 trillion links is almost the same as the number of synapses in your brain. A quadrillion transistors is almost the same as the number of neurons in your brain. So to a first approximation, we have these things - twenty petahertz synapse firings. Of course, the memory is really huge. But to a first approximation, the size of this machine is the size - and its complexity, kind of - to your brain. Because in fact, that's how your brain works - in kind of the same way that the Web works. However, your brain isn't doubling every two years. So if we say this machine right now that we've made is about one HB, one human brain, if we look at the rate that this is increasing, 30 years from now, there'll be six billion HBs. So by the year 2040, the total processing of this machine will exceed a total processing

power of humanity,

5:42
in raw bits and stuff. And this is, I think, where Ray Kurzweil and others get this little chart saying that we're going to cross. So, what about that? Well, here's a couple of things. I have three kind of general things I would like to say, three consequences of this. First, that basically what this machine is doing is embodying. We're giving it a body. And that's what we're going to do in the next 5,000 days - we're going to give this machine a body. And the second thing is, we're going to restructure its architecture. And thirdly, we're going to become completely codependent upon it.

6:20
So let me go through those three things. First of all, we have all these things in our hands. We think they're all separate devices, but in fact, every screen in the world is looking into the one machine. These are all basically portals into that one machine. The second thing is that -- some people call this the cloud, and you' re kind of touching the cloud with this. And so in some ways, all you really need is a cloudbook. And the cloudbook doesn't have any storage.It's wireless. It's always connected. There's many things about it. It becomes very simple, and basically what you're doing is you're just touching the machine, you're touching the cloud and you're going to compute that way. So the machine is computing.

07:01
And in some ways, it's sort of back to the kind of old idea of centralized computing. But everything, all the cameras, and the microphones, and the sensors in cars and everything is connected to this machine. And everything will go through the Web. And we're seeing that already with, say, phones. Right now, phones don't go through the Web, but they are beginning to, and they will. And if you imagine what, say, just as an example, what Google Labs has in terms of experiments with Google Docs, Google Spreadsheets, blah, blah, blah --all these things are going to become Web based. They're going through the machine. And I am suggesting that every bit will be owned by the Web. Right now, it's not. If you do spreadsheets and things at work, a Word document, they aren't on the Web, but they are going to be. They're going to be part of this machine. They're going to speak the Web language. They're going to talk to the machine. The Web, in some sense, is kind of like a black hole that's sucking up everything into it. And so everything will be part of the Web. So every item, every artifact that we make, will have embedded in it some little sliver of Web-ness and connection, and it will be part of this machine, so that our environment -- kind of in that ubiquitous computing sense -- our environment becomes the Web. Everything is connected.

14. Listen again and complete the missing words in the following sentences.

1. coming for free (there is no other gap in this sentence)
2. impossible
3. runs the number
4. approximation (there is no other gap in this sentence)
5. codependent
6. wireless
7. sensors
8. embedded

1. Read the text and, in pairs, fill in the blanks choosing the correct words from the list below. Some words are written in bold to help you choose.

1. input	2. intermediary	3. hardware	4. phones
5. consoles	6. friendly	7. processes	8. users
9. networked	10. guest	11. data	12. operating

2. Are the following sentences true (T) or false (F) according to the text?

a. F	**b. T**	**c. F**	**d. T**	**e. T**

3. Answer the following questions using information from the text above.

(suggested answers)

1. **What does an operating system do?**
   An operating system (OS) is system software that manages computer hardware and software resources and provides common services for computer programmes.
2. **What kind of devices does an operating system need to work?**
   Devices that contain a computer.
3. **How is multi-tasking operation achieved?**
   By time-sharing, where the available processor time is divided between multiple processes.
4. **What is the difference between multi-tasking and multi-user operating systems?**
   A single-tasking system can only run one programme at a time, while a multi-tasking operating system allows more than one programmes to be running at the same time.
5. **What does a distributed operating system do?**
   A distributed operating system manages a group of distinct computers and makes them appear to be a single computer.
6. **What does "templating" mean?**
   Templating refers to creating a single virtual machine image as a guest operating system, then saving it as a tool for multiple running virtual machines.

7. What are the characteristics of embedded operating systems?

They are able to operate with a limited number of resources. They are very compact and extremely efficient by design.

8. What is the basic characteristic of real-time operating systems?

A real-time operating system is a time bound system which has well defined fixed time constraints.

9. What is a library operating system?

In a library operating system, services such as networking are provided in the form of libraries and composed with the application and configuration code to construct a unikernel.

10. What is a uni-kernel?

A specialized, single address space, machine image that can be deployed to cloud or embedded environments.

5. Do you know the meaning of the following words? In pairs, match the words (1-10) with the definitions (A-J).

1. H	**2. D**	**3. J**	**4. G**	**5. A**
6. C	**7. I**	**8. B**	**9. F**	**10. E**

6. Complete the sentences with the correct word from the following word list. There is one extra option you do not need.

1. uptime	**2. interface**	**3. vulnerability**	**4. directories**
5. device drivers	**6. boot programme**	**7. attack vectors**	

7.Complete each blank in the following pairs of sentences with the correct word.

1.a. vulnerability	**2.a. Linux**	**3. a. open source**
1.b. security	**2.b. Microsoft Windows**	**3. b. proprietary**

8.Complete the sentences using the correct form of the adjectives/adverbs in brackets. Add any other words are necessary.

1. earlier than	2. the most	3. reliable as	4. of the most important	5. the best
6. more economical	7. a higher/ a larger	8. fewer/ more secure	9. older	10. the higher/ the more expensive

11. Complete the sentences choosing the right item.

1. the most	**2. the best**	**3. the safest**	**4. as**	**5. further**

13. Listen to the dialogue between a man and a woman talking about computer problems, and answer the following questions.

1. What exactly is the problem with the woman's computer?
It's just terribly slow. It used to be fast, but now she can hardly use it.
2. Does she use the antivirus programme regularly?
No she has turned it off.
3. What did she find annoying?
The fact that warnings kept popping up when she was surfing the Internet.
4. What does the technician intend to do about the problem?
He'll take a look to see whether the computer's been infected with something, in order to get rid of it.
5. How much will it cost to fix the problem?
$*100 if it's simple, $200 if he has to reformat and reinstall the operating system.*
6. What do you think the expression "that's a good racket" means?
***D*oes it have a positive or a negative meaning?**
Probably she finds the price too high. It means that he has a job that provides an easy and profitable living.
7. How long will the technician take to fix the computer?
Probably a couple of days.

14. Listen to the dialogue again and complete the missing words in the following sentences

1. What exactly is **wrong** with it?
2. Do you have antivirus and **anti-malware** programmes installed?
3. Warnings kept **popping up** when I was surfing the Internet.
4. If your computer's been **infected** with something, we can try to get rid of it.
5. Others are more difficult—we might have to **reformat** your hard drive.
6. $200 if we have to reformat and **reinstall** your operating system.
7. Would you like to **think** it **over**?
8. No, I need it fixed. When can I **pick it up**?

Transcript https://www.oxfordonlineenglish.com/computer-problems
Man: What can I do for you?
Woman: Yes, hello, my computer… There's a problem.
Man: Right, OK. What exactly is wrong with it?
Woman: It's just terribly slow. It used to be fast, but now I can hardly use it.
Man: I see. Do you have antivirus and anti-malware programs installed?
Woman: Yes…
Man: And do you use them regularly?
Woman: Actually, I turned them off. Warnings kept popping up when I was surfing the Internet, and it was a bit annoying.
Man: Hmm… You know those warnings might have been important?
Woman: Yes, well… Do you think you can fix it?
Man: I'll take a look. If your computer's been infected with something, we can try to get rid of it.
Woman: Is that easy?
Man: It depends. Some things you can just delete. Others are more difficult—we might have to reformat your hard drive.

Woman: How much will you charge to fix it?
Man: $100 if it's simple, $200 if we have to reformat and reinstall your operating system.
Woman: $200?! That's a good racket you have going here!
Man: Would you like to think it over?
Woman: No, no, I need it fixed. When can I pick it up?
Man: We'll call you in the next couple of days