Progression Booklet

Cambridge Technicals in IT

Contents:

I. Key Words in Written Assignments

Understanding the command words for different levels is vitally important for success. Below are sample words that may be used in assignments for the different levels. Fill in the definition of these words on the right-hand side on the table for Pass, Merit and Distinction. **Make sure your definitions are detailed** so the difference between each key term is clear.

Key Words for a Pass

Describe	
Research	
Investigate	
Promote	
Produce	
Outline	
Develop	
Suggest	
Create	
Communicate	
Present	
Follow	
Explain	

Key Words for a Merit

Examine	
Compare and Contrast	
Recommend	
Plan	
Select	
Implement	
Conduct	

Key Words for a Distinction

Analyse	
Evaluate	
Justify	
Assess	
Discuss	
Predict	

References

Please list also record the links to the websites you used to help research the above definitions. *Remember listing Google web addresses are incorrect as Google is a search engine. Ensure you click through from Google to find the accurate source of the information used before copying and pasting the web addresses.*

II. The Internet of Everything

Within your Unit 1 *Fundamentals of IT* exam and also relevant to various coursework units, you will be expected to understand how modern organisations utilise emerging technologies and network connectivity to change the way they operate. The Internet of Everything (IoE) brings together people, process, data, and things to make networked connections more relevant and valuable than ever before.

According to industry reports, the Internet of Everything has the potential to transform industries from healthcare to manufacturing by turning information into actions that create new capabilities, richer experiences, and unprecedented economic opportunity.

Your next task is to investigate the core pillars, real-world applications, and potential risks associated with the Internet of Everything.

Create a comprehensive report, presentation, or alternative product of your choice fully covering the following three parts. Ensure your work is highly detailed, includes suitable imagery, and is fully referenced.

The Four Pillars of IoE

To understand the Internet of Everything, you must first understand the four distinct pillars that power it. Your task is to define and describe what each of the following pillars means within an IoE ecosystem, providing a clear real-world example for each:

- **People:** How people connect to the internet in more valuable ways.
- **Process:** How data is handled and delivered to the right person or machine at the right time.
- **Data:** How raw data is collected, summarised, and transformed into useful intelligence.
- **Things:** Physical devices, sensors, and objects connected to the internet and each other (IoT).

IoE in Action: Industry Case Studies

Select **two** of the following sectors and research how they are currently using or planning to use IoE technology. For each of your chosen sectors, identify the specific types of smart devices/sensors used, the data they collect, and the benefits they bring to consumers or businesses:

- **Smart Homes & Cities** (e.g., smart grids, traffic management, home automation)
- **Healthcare** (e.g., wearable health monitors, smart pills, remote patient tracking)
- **Retail & Logistics** (e.g., automated inventory tracking, smart shelves, supply chain tracking)
- **Agriculture (Farm Tech)** (e.g., soil sensors, automated irrigation, automated livestock tracking)

The Challenges of a Connected World

With billions of devices connecting to each other, IoE brings massive advantages but also introduces severe risks. Research and analyse the following three critical challenges associated with IoE systems:

1. **Security & Cyber-Attacks:** Why are smart devices frequently targeted by hackers, and what are the risks of an IoE network breach?
2. **Data Privacy:** Who owns the data collected by smart devices? What are the implications under regulations like GDPR?
3. **Interoperability & Standards:** Why is it difficult to get devices made by hundreds of different manufacturers to communicate effectively with one another?

References & Research Links

Please record the exact links to the websites you used to help research your findings. Remember, listing Google web addresses is incorrect as Google is a search engine. Ensure you click through to find the accurate source of the information.

Some links to help you get started are:

- **Cisco's Internet of Everything Overview:** https://www.cisco.com/c/dam/en_us/about/business-insights/docs/ioe-value-index-whitepaper.pdf
- **IoT vs IoE Explained:** https://www.techtarget.com/iotagenda/definition/Internet-of-Everything-IoE

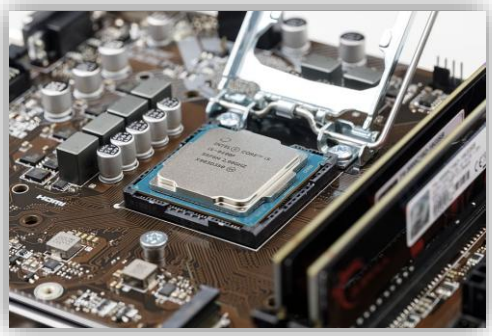
III. Investigate the Components of a Computer System

Within your Unit 1 Fundamentals of IT exam and also for your Unit 18 Computer Systems Hardware coursework unit you will be expected to identify the variety of component parts of a computer system and be able to **explain their characteristics**.

Your next task is to use the list of components below and using PowerPoint or an equivalent application create a presentation identifying what each component is, their purpose and characteristics as well as including with suitable images or videos. Ensure **all** of the items listed below are included.

Be detailed in your descriptions and ensure you **fully reference** where you obtained your information.

1. Processors (Central Processing Unit)
2. Motherboards
3. Computer Storage:
    a. Hard Drives
    b. Solid State Drives
    c. Flash Drives
    d. Cloud Storage
4. Ports:
    a. USB
    b. Firewire
    c. SATA
    d. Network
    e. Fibre Channel
5. Memory:
    a. RAM
    b. ROM
    c. Cache
6. Expansion Cards:
    a. Sound Cards
    b. Network Cards
    c. Graphics Cards
7. Power Supply
8. Input Devices:
    a. Keyboard
    b. Mouse
    c. Scanner
    d. Microphone
9. Output Devices:
    a. Monitor (Visual Display Unit)
    b. Printer
    c. Speakers and Headphones



IV. Pioneers of Virtual and Augmented Reality

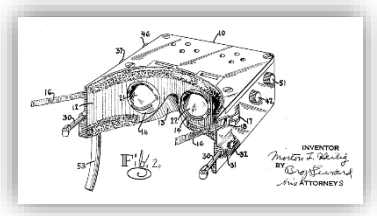
One of the units you will undertake on this course is Unit 5 – Virtual and Augmented Reality.

According to a report by PwC from November 2019 "VR and AR have the potential to provide a significant boost to the global economy, and also improve the way organisations operate, make processes faster and more effective, educate people more effectively and create incredible user experiences" [https://www.pwc.com/gx/en/news-room/press-releases/2019/seeing-is-believing-vr-ar.html – Accessed 28/04/2020]. Therefore this technology is at the cutting edge of the IT sector and many industries.

Your next task is to investigate the history behind the development of Virtual and Augmented Reality concepts and technology. Below are some 'Pioneers of VR and AR'.

You should select 3 of the bullet points – or find alternative pioneers of your own to further research.

Suggested Pioneers:



- Douglas Engelbart
- Ivan Sutherland
- Tom Caudell and David Mizell
- Morton Heilig

Create a fact file about each one selected and ensure you include:

1. Who they are/were and where are they from.
2. What their involvement in AR and/or VR was and how their work contributed to the development of these technologies.
3. Whether their innovations are being further developed today.
4. Any other interesting facts about them and their work in this field.
5. Suitable images.
6. References to where your information was sourced from.

Some links to help you get started are:

The Augmentation of Douglas Engelbart Documentary (free to watch via Amazon Prime):

Origins of VR: The 1968 3D Head-Mounted Display System:
https://blog.siggraph.org/2018/08/vr-at-50-celebrating-ivan-sutherland.html/

Augmented Reality, the Past the Present and the Future: https://www.interaction-design.org/literature/article/augmented-reality-the-past-the-present-and-the-future

Forgotten genius: the man who made a working VR machine in 1957:
https://www.techradar.com/uk/news/wearables/forgotten-genius-the-man-who-made-a-working-vr-machine-in-1957-1318253

Augmented Reality Gets to Work:
https://www.technologyreview.com/2014/02/24/173872/augmented-reality-gets-to-work/

V. Cyber Security

Cyber Security is a key learning outcome in your Unit 2 Exam and it can also be chosen as an additional exam as an entire unit in itself. Create a report, presentation or alternative product of your choice fully covering the following.

Part 1 – Cyber Security Basics

Organisations big and small must consider cyber security in this modern age of data storage and data transfer. It can now be said for many businesses that their data is their most valuable and important asset, so keeping it safe and secure is paramount.

To ensure data is safe, businesses make use of the CIA Triad (No, not that CIA, and no, not that Triad). Your task is to find out what each of the letters stand for in the CIA triad and how each of them relate to data security.

Part 2 – Know Your Cyber-Attacks

There are simply too many viruses, cyber-attacks and other methods to see, steal or delete data to list. But many cyber-attacks can be categorised as either 'Social Engineering' or 'Malware'.

For each of the below types of cyber-attack you must:

a) Explain how it works
b) Is it malware or social engineering or something else
c) How it attacks users
d) Provide all references (web links) you used to do your research

- Worms
- Trojan Horse
- Phishing email
- Shoulder surfing
- Spyware
- DOS attack

Part 3 – Cyber Security Techniques

To combat the growing list of possible attacks, there are also many methods of security to prevent attacks. The following list is a mixture of detection systems, physical or software security. For each one, describe what it is and how it provides security to systems and data (Provide all references).

- Penetration testing
- Fuzzing
- Biometric access
- Cable locks
- Firewalls
- Patch management
- Encryption
- Cryptography

VI. iDEA Award

The Inspiring Digital Enterprise Award (iDEA) is the digital equivalent of the Duke of Edinburgh Award and is designed for you to gain a nationally recognised certificate at Bronze or Silver level. Gold is coming soon too.

Students who complete this award will be able to mention this on their UCAS personal statements when applying to university or include it on their CVs when applying for jobs or apprenticeships.

We recommend you set aside some time each week to work through the Bronze badges to start with. Students who accumulate over 250 Bronze badge points with at least 50 points in each of the 4 main categories Citizen, Worker, Maker and Entrepreneur will gain the award. We already have some TPAT students who have achieved this. Upon completion of the Bronze award some of you may wish to continue on to the Silver award.

You can select the badges that are of interest to you, though some of them are particularly relevant to the subject content for the IT Cambridge Technical course such as Virtual Reality, Cyber Security, GDPR, What is the Cloud, Digital Ethics etc.

You should sign up at https://idea.org.uk/x/KS5-TPAT using your LPA or APS email address. Please use this link as it will assign you into the KS5 TPAT group for us to track your progress.

Below is the complete list of Bronze Badges available at the moment – though more are often being added.

iDEA CITIZEN	iDEA WORKER	iDEA MAKER	iDEA ENTREPRENEUR	iDEA GAMER
Brain Hack	Collaboration	Animation	Advertising	BAFTA Game Concept
What is the Cloud?	Colours	Automation	Big Data	
Cyber Spies	Data Visualisation	Coding Solutions	Blockchain	Game Designer
Data Play	Digital Portfolios	GIF Making	CRM	Intro to Gaming
Digital Ethics	Image Specialist	Graphic Design	Growth Hacking	Python Quiz
eCommerce	Internet of Things	JQuery Coding	Idea Influencer	Make a Game
E-Safety	Projects	Making Websites	Innovation	
Social Media Ethics	Design Psychology	Video Editing	Jargon Buster	
Fake News	Random Coding	Virtual Reality	Money Management	
Farm Tech	Digital Research	Jr Web Design		
GDPR	Sys Admin		Problem Solving	
Global Goals	User Interfaces		Researcher	
Internet & Web	User Experience		Social Media in Business	
Personal Statement			Social Selling	
Safe Online			The Art of Selling	
Social Media Set-Up				
Teamwork				
Cyber Security				