Level 3 Systems architecture (7540-041/7630-350)

Systems and Principles
Assignment guide for Candidates
Assignment B

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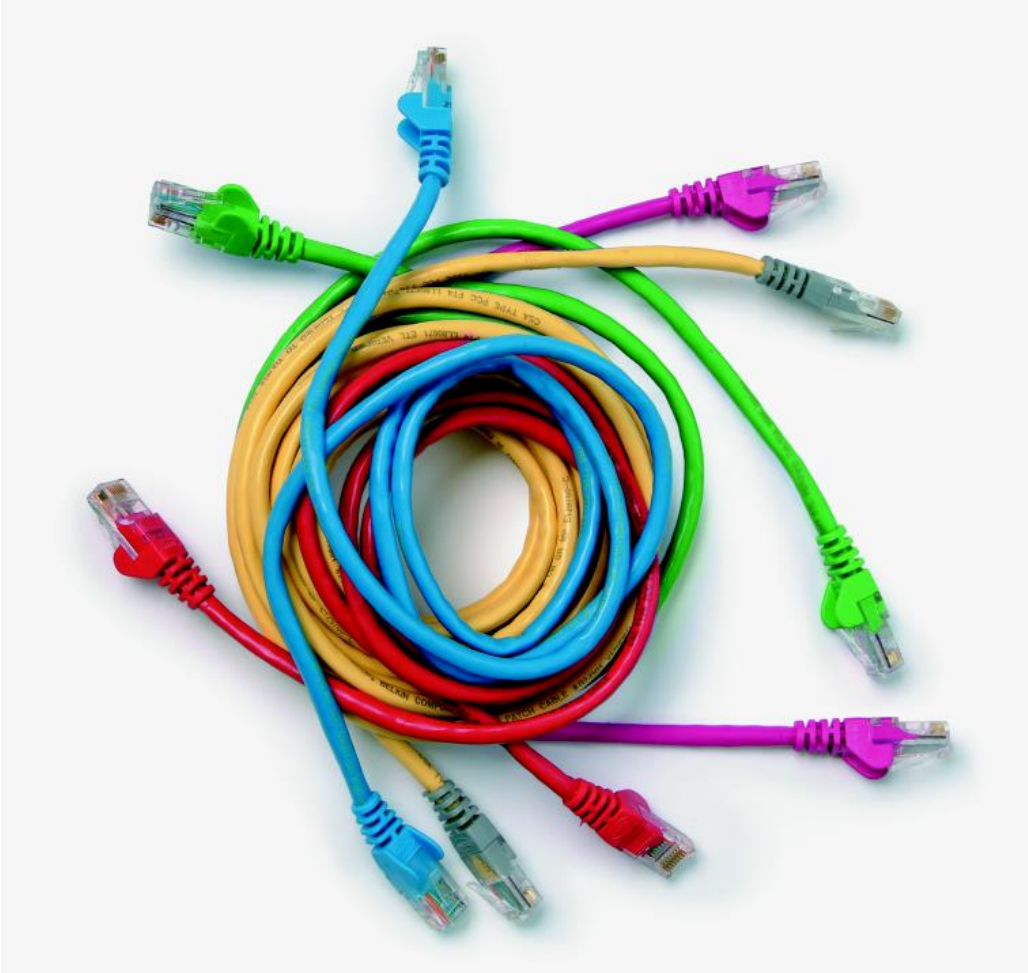

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Introduction – Information for Candidates

About this document
This assignment comprises all of the assessment for Level 3 Systems architecture (7540-041/7630-350).

Health and safety
You are asked to consider the importance of safe working practices at all times.

You are responsible for maintaining the safety of others as well as your own. Anyone behaving in an unsafe fashion will be stopped and a suitable warning given. You will **not** be allowed to continue with an assignment if you compromise any of the Health and Safety requirements. This may seem rather strict but, apart from the potentially unpleasant consequences, you must acquire the habits required for the workplace.

Time allowance
The recommended time allowance for this assignment is **3 hours**.

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Candidate instructions

Candidates are advised to read **all instructions** carefully before starting work and to check with your assessor, if necessary, to ensure that you have fully understood what is required.

Time allowance: 3 hours

This assignment is made up of **three** tasks

- Task A – Information representation and processing in a computer
- Task B – Operating systems
- Task C – Demonstrate Operating System interfaces and functions

Scenario

Following the successful completion of your Apprenticeship, you are now employed as a Technical Assistant in a Learning Materials Publishing Company. Your line manager will shortly be producing a presentation outlining new learning materials for a short course on Computer System Architecture. You have been tasked with providing brief, factually correct information for your line manager to use in this presentation.

It is important that the information / explanations you provide use simple and non-technical language, wherever possible. Diagrams and sketches may be hand drawn or produced using a computer.

Task A – Information representation and processing in a computer

Please use the Answer Sheet provided to complete Task A.

1 Describe the operation of the following, giving examples in each case:

- **three** input devices
- **two** output devices
- **three** storage devices
- **three** peripheral devices.

2 Describe and give examples of how the following number systems store information in a computer:

- binary
- hexadecimal
- ASCII
- EBCDIC.

3 Produce a diagram explaining the operation of the Fetch Execute Cycle.

4 Produce a block diagram of the Central Processing Unit (CPU) describing the function of at least **five** components.

Task B – Operating Systems

Please use the Answer Sheet provided to complete Task B.

1 Briefly describe how the **four** security features listed below, which are typically built into a network operating system, can contribute to data and system security:

- passwords
- access rights
- permissions
- firewalls.

2 Explain, using examples, the terms "Multitasking" and "Multiprogramming"

3 Briefly describe the role of the **six** processes listed below that are involved in a computer operating system:

- file management (directory structure, file structure, file access control, storage methods)
- input and output control.
- memory management techniques
- storage protection methods
- deadlock
- resource allocation and scheduling.

4 Outline the following **five** functions and operations of **Distributed Operating Systems**:

- control of multiple sites
- user access of multiple sites
- connection of PC, Unix, mainframe and other systems
- client/server model
- use and format of Structured Query Language (SQL).

5 Explain how the following aspects of "Data Communications Systems" contribute to the effective functioning of both Network and Distributed Operating Systems:

- high performance
- reliability
- robustness
- scalability
- security.

6 Briefly outline the evolution and **current** characteristics of distributed applications over the last 15 years.

7 Outline the operation and function of a database mainframe system in terms of transaction processing and explain the following terms:

- COMMIT
- ROLLBACK.

8 Outline what is meant by data distribution in terms of

- data replication
- data fragmentation
- overheads of locking data for concurrent access
- query optimisation.

Task C – Demonstrate Operating System interfaces and functions
[use screen prints to demonstrate the following]

1 Using the text editor within an Operating System available to you, **create**, **name** and **save** a simple ASCII text file.

2 Using the Graphical User Interface (GUI) of an Operating System available to you **copy** this saved text file to a different storage location

3 Using the Command Line Interface (CLI) of an Operating System available to you:

- **rename** the copied version of the text file you created
- **delete** the original ASCII text file you created

4 Demonstrate how a "**backup and restore**" should be conducted within an Operating System available to you

When you have finished working:

- Sign each document above your name and label all removable storage media with your name.
- Hand all paperwork and removable storage media to your assessor.

If the assignment is taken over more than one period, all paperwork and removable media must be returned to the test supervisor at the end of each sitting.

End of assignment

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