e-Quals Unit Syllabus

Level 2 Testing ICT systems 2

7266/7267 – 405

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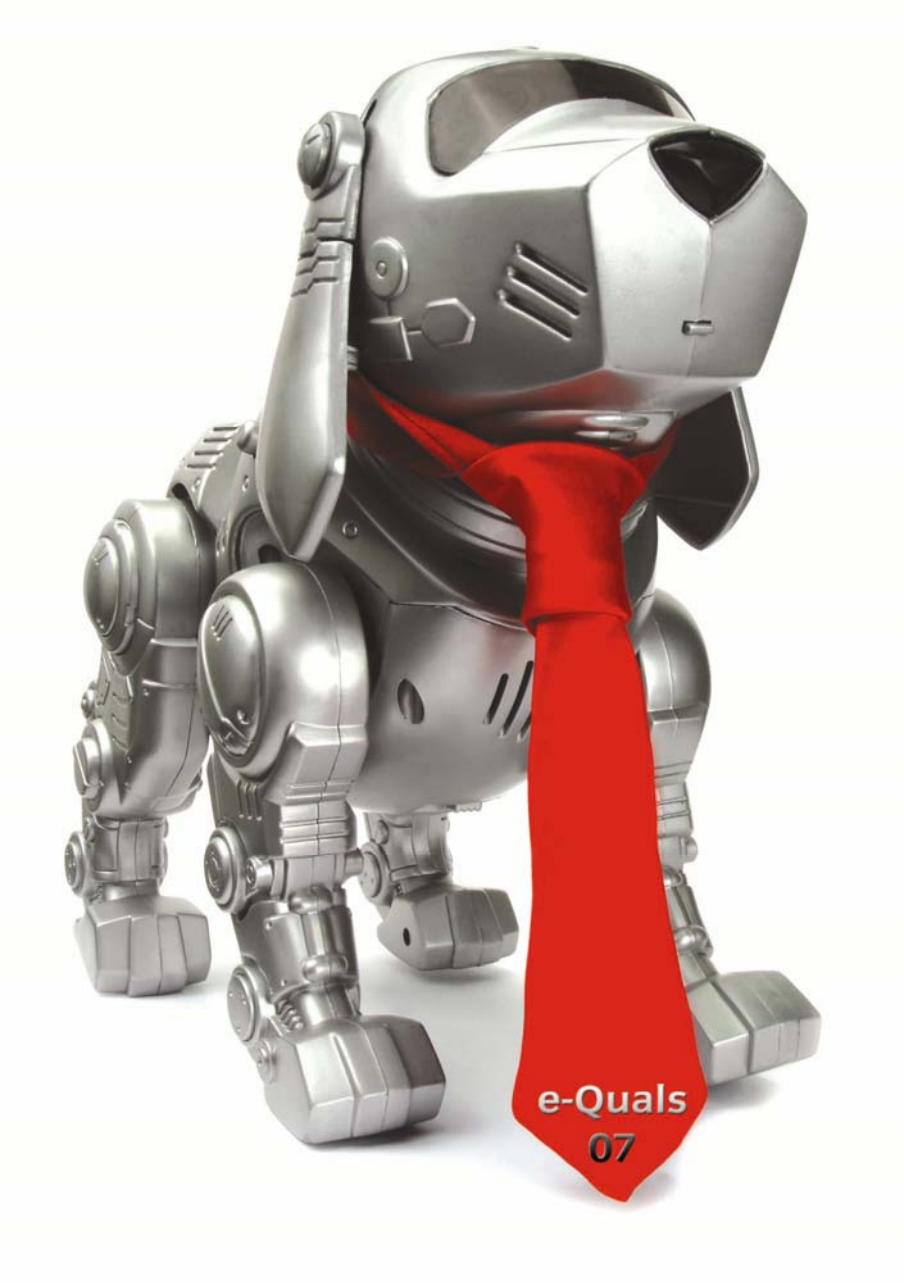

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Unit 405 Testing ICT systems 2

Rationale

This unit will enable candidates to implement routine hardware and software diagnostic and test procedures on ICT systems. They will also get hands-on experience of selecting and applying test and fix procedures for various ICT systems.

Learning outcomes

There are **three** outcomes to this unit. The candidate will be able to:

- Use typical diagnostic and test procedures
- Apply standard test procedures to PC systems and peripherals
- Interpret test results to identify faulty components and apply simple fixes

Guided learning hours

It is recommended that 30 hours should be allocated for this unit. This may be on a full time or part time basis.

Connections with other qualifications

This unit contributes towards the knowledge and understanding required for the following qualifications:

NVQ for IT Practitioners (4324) Level 2

Outcome	Unit
1, 3	Software installation and upgrade
3	system operation
1, 2, 3	Technical advice and guidance
1, 2, 3	Technical fault diagnosis
2, 3	Technical fault remedy selection
1, 2, 3	Testing ICT systems
1, 2, 3	Working with ICT hardware and equipment

Key Skills

This unit contributes towards the Key Skills in the following areas:

Application of number	N/A
Communication	2.1a.1, 2.1a.2, 2.1a.3, 2.1b.1, 2.1b.2, 2.1b.3
ICT	2.1.1, 2.2.1, 2.2.2, 2.3.1, 2.3.2
Working with others	2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 2.3.3
Improving own learning	2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 2.3.3
Problem solving	2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 2.3.3

Assessment and grading

Assessment will be by means of a **set assignment** covering both practical activities and underpinning knowledge.

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Outcome 1 Use typical diagnostic and test procedures

Practical activities

The candidate will be able to:

1 use current commercially available diagnostic and testing software to investigate the operation of system hardware eg
   - a CPU
   - b memory
   - c system board (including buses and controllers)
   - d I/O ports
   - e display devices and adaptors
   - f keyboard and mouse
   - g other peripherals and system devices

2 use diagnostic, test and configuration utilities built into a current commercially available, non-network, operating system eg
   - a disk scan for data errors and surface errors
   - b disk defragmentation
   - c system/performance monitors
   - d display tests and resolution settings
   - e mouse and keyboard configuration
   - f audio tests and configuration
   - g driver identification, configuration and upgrade
   - h registry checker
   - j system file restore
   - k system security
   - l operating system configurations
   - m background programs

3 use diagnostic and configuration utilities built into a typical system eg
   - a Power On Self Test (POST)
   - b Self Monitoring and Reporting Technology (S.M.A.R.T.) for hard disk drives
   - c BIOS set-up (all menus)
   - d BIOS error messages
   - e printer self test/print utility
   - f other peripheral self-test facilities

Practical activities continued

4 use anti-virus software to
   a scan for viruses
   b configure to update virus scan engine and virus definitions
   c scan disks
   d check email attachments
5 use security software to scan for and deal with
   a spyware
   b adware
   c other malware
6 use test equipment eg
   a digital and analogue multi-meters
   b loop-back connectors
   c network analysers
   d cable testers.

Underpinning knowledge

The candidate will be able to:

1 describe the function of typical diagnostics, tests and other utilities provided with operating systems and by third party software eg
   a disk and file system error detection and repair
   b disk defragmentation
   c system monitor
   d display settings
   e mouse and keyboard configuration
   f audio tests and configuration
   g system conflict resolution
   h driver identification and configuration
   j registry checker
   k backup and restore
   l network analysers

Underpinning knowledge continued

2 describe typical features of diagnostic software used for
   - a processor function tests
   - b memory tests
   - c system board function
   - d I/O tests
   - e display mode tests
   - f keyboard and mouse function
   - g test logging and reporting
   - h virus, adware, spyware, and malware detection
   - j analysing a network

3 describe the typical features and operation of resident self tests eg
   - a Power On Self Test (POST)
   - b Self Monitoring And Reporting Technology (SMART)
   - c Other built in self tests

4 describe the features and operation of typical anti-virus utilities eg
   - a boot sector protection
   - b protection during boot-up
   - c virus scan engines and definitions
   - d on-line updates to engine and definition files
   - e real-time scanning
   - f manual scanning
   - g methods of protection eg
     - i clean
     - ii quarantine
     - iii delete
   - h preventing infection from optical disks, web sites, email

5 describe features of security software for
   - a spyware
   - b adware
   - c malware

6 state the function of commonly used items of test equipment and describe their use
   - a digital and analogue multi-meters
   - b serial and parallel loop-back connectors
   - c temperature probe
   - d network testers
   - e cable testers.

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Outcome 2 Apply standard test procedures to PC systems and peripherals

Practical activities

The candidate will be able to:

1 gather relevant information for testing devices/equipment

2 comply with standard procedures (for both hardware and software) to test equipment for correct operation eg

- a printer
- b scanner
- c monitor
- d keyboard
- e mouse
- f speakers
- g microphone
- h web-cam
- j other available peripherals
- k simple network eg
  - i peer-to-peer
  - ii wireless
- l software (OS and applications)

3 assist with performing more complicated tests on equipment eg

- a stress test
- b performance test
- c usability test
- d security test
- e integration test
- f functional test

4 perform automated testing routines

5 produce a test results report.

Underpinning knowledge

The candidate will be able to:

1 describe the difference between hardware and software testing

2 identify the purpose and features of different types of tests eg

- a stress test
- b performance test
- c usability test
- d security test
- e integration test
- f functional test

3 describe how automated testing is typically done

4 describe purpose of

- a unit test
- b module test
- c system test
- d sub system test

5 identify a range of sources for product information, diagnostic and testing procedures eg

- a help/readme files
- b technical web sites
- c manufacturer manual/website
- d local logs/information
- e advice from colleagues
- f user groups

6 describe typical methods of collecting and recording test data for standard test procedures

7 identify typical faults with systems and peripherals eg

- a electronic
- b mechanical
- c replaceable units
- d corrupt software
- e firmware
- f cosmetic.

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Outcome 3 Interpret test results to identify faulty components and apply simple fixes

Practical activities

The candidate will be able to:

1 interpret test data from standard test procedures comparing expected and actual results

2 identify erroneous test results and take action to correct test conditions

3 confirm from test results that a system functions within acceptable limits

4 apply typical fault fixes on hardware and software according to test results

- a main system components
  - i system board
  - ii CPU
  - iii memory
- b disk drives
  - i HDD
  - ii optical disk drives
  - iii FDD
- c BIOS/CMOS errors
- d power supply failure
- e expansion cards
  - i video
  - ii sound
  - iii NIC
- f monitor adjustment and configuration
- g keyboard and mouse
- h printer/scanner problems
- j other peripheral equipment
- k simple network eg
  - i peer-to-peer
  - ii wireless
- l operating system problems
- m software application problems
- n wrong or corrupted device driver
- p bug fixes
- q device conflicts
- r software conflicts

5 record information using locally created documentation eg

- a test results
- b failed equipment details
- c recommended rectification action
- d details of serviceable equipment (service data etc)
- e fix applied.

Underpinning knowledge

The candidate will be able to:

1 describe how to interpret test results

2 differentiate between expected and actual results

3 describe typical fixes that can be applied to hardware and software when faults are identified in test results

- a main system components
  - i system board
  - ii CPU
  - iii memory
- b disk drives
  - i HDD
  - ii optical disk drives
  - iii FDD
- c BIOS/CMOS errors
- d power supply failure
- e expansion cards eg
  - i video
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- p bug fixes
- q device conflicts
- r software conflicts

4 describe what is included in documentation where test results and fault fixes are typically recorded.

Unit record sheet

Use this form to track your progress through this unit.

Tick the boxes when you have covered each outcome. When they are all ticked, you are ready to be assessed.

Outcome		✓	Date
1	**Use typical diagnostic and test procedures**	☐	
2	**Apply standard test procedures to PC systems and peripherals**	☐	
3	**Interpret test results to identify faulty components and apply simple fixes**	☐	

Candidate Signature ..... **Date** .....

City & Guilds Registration Number .....

Quality nominee (if sampled) ..... **Date** .....

Assessor Signature ..... **Date** .....

External Verifier Signature (if sampled) ..... **Date** .....

Centre Name ..... **Centre Number** .....

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