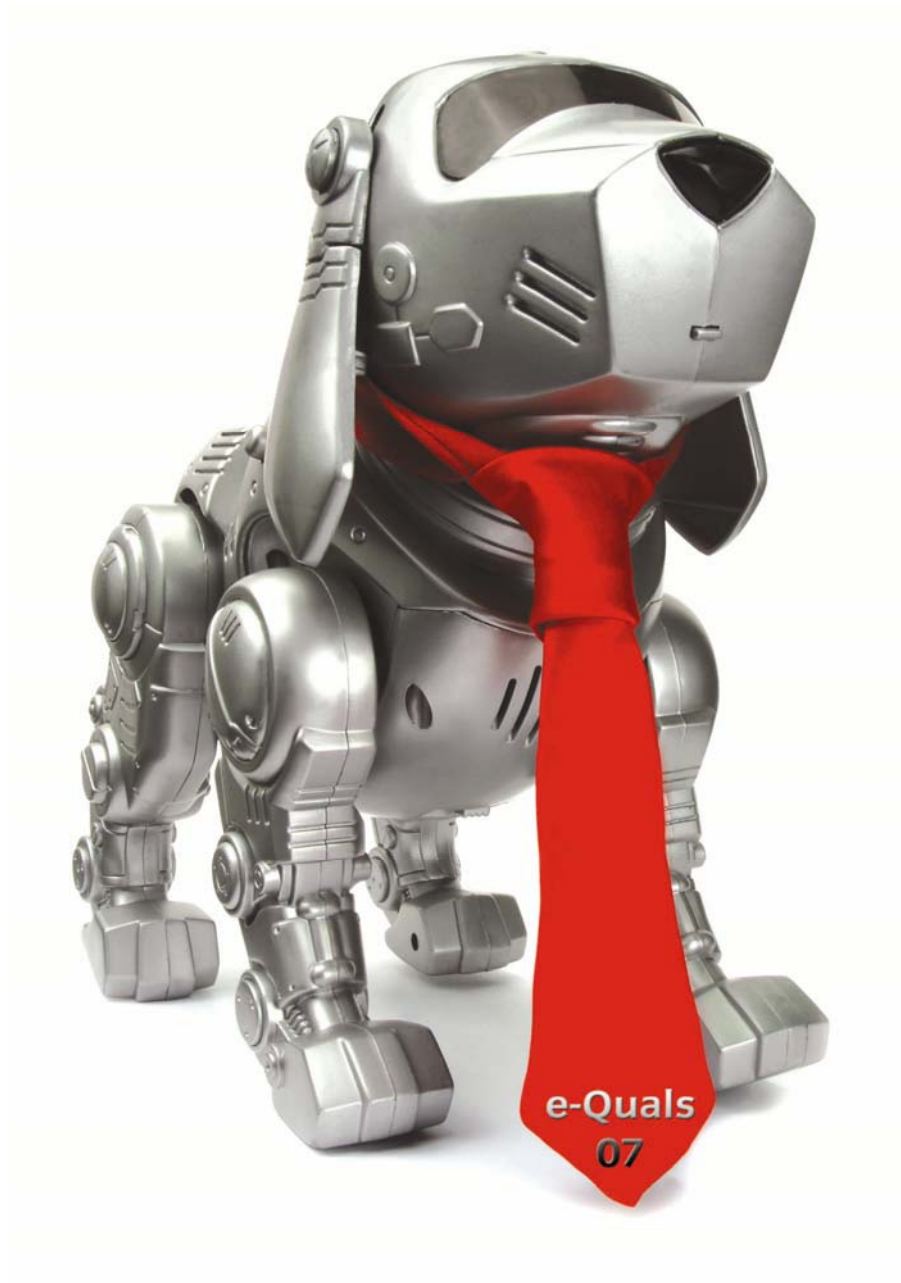


e-Quals Unit Syllabus

Level 2 Maintain ICT equipment and systems 2
7266/7267 – 401



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Contents

Unit 401	Maintain ICT equipment and systems 2	2
Outcome 1	Identify hazards associated with ICT equipment and reduce risks to systems and personnel	4
Outcome 2	Identify failures in ICT equipment and apply appropriate fixes	8
Outcome 3	Apply preventative maintenance to ICT systems	11
Unit record sheet		13

Rationale

The ability to maintain ICT equipment and systems is a valuable skill in the IT support industry. This unit will enable candidates to identify and fix problems with ICT equipment. Candidates will develop theoretical and practical knowledge of identifying failures of ICT equipment, and applying corrective and preventative maintenance. It will also guide candidates in identifying hazards associated with ICT equipment and in establishing a safe working environment.

Learning outcomes

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

- Identify hazards associated with ICT equipment and reduce risks to systems and personnel
- Identify failures in ICT equipment and apply appropriate fixes
- Apply preventative maintenance to ICT systems

Guided learning hours

It is recommended that 60 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
3	Customer care
2, 3	Software installation and upgrade
2, 3	system operation
2, 3	Technical advice and guidance
2, 3	Technical fault diagnosis
2, 3	Technical fault remedy selection
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
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
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

Assessment and grading

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

Unit 401

Outcome 1

Maintain ICT equipment and systems 2

Identify hazards associated with ICT equipment and reduce risks to systems and personnel

Practical activities

The candidate will be able to:

- 1 apply workplace health and safety procedures
- 2 perform a health and safety risk assessment to evaluate common hazards that exist in the workplace
- 3 Use workplace procedures to minimise common workplace hazards and risks eg
 - a trailing cables
 - b noise levels
 - b electric shock hazards
 - c tools used in computer maintenance eg PC repair toolkit
- 4 comply with safe working practices when in a computer work environment considering eg
 - a electrical safety
 - b Electrostatic discharge (ESD)
 - c behaviour of self and others
 - d other safety connected with dismantling and assembling a Personal Computer
- 5 demonstrate safe use of and manual handling techniques for ICT equipment
 - a various tools eg ESD protection equipment, PC repair toolkit, multi-meter
 - b lifting/moving base units, monitors, printers etc
 - c ICT workstation furniture
- 6 check fuse ratings and correct wiring of plugs for a range of items to comply with current regulations eg
 - a monitor
 - b base unit
 - c printer
 - d scanner
- 7 test common anti-static devices to ensure that they are functioning correctly
- 8 use anti-static precautions when working with static sensitive ICT equipment
- 9 set up an ICT system whilst complying with current regulations eg
 - a health and safety
 - b environmental
 - c organisational requirements

Practical activities continued

- 10 demonstrate safe use of a PC with regard to
 - a workstation ergonomics
 - b injuries caused by repeated use of a PC eg Repetitive Strain Injury (RSI), Upper Limb Disorder (ULD)
 - c minimising screen glare
 - d adjustment of monitor contrast, colour and refresh rate
- 11 pack/unpack and fit static sensitive devices eg
 - a printed circuit boards (system board, expansion cards)
 - b disk drive (CD/DVD drive, hard disk)
 - c RAM
 - d CPU.

Underpinning knowledge

The candidate will be able to:

- 1 identify the people likely to be responsible for managing health and safety, and typical location/content of health and safety procedures
- 2 describe factors that affect health and safety at work
 - a environmental (heating, dust, noise, etc)
 - b occupational (risk of electric shock, ESD, etc)
 - c human (training, change of behaviour, carelessness, etc)
- 3 define the main duties of employers and employees according to the current health and safety at work legislation eg
 - a safe working practices
 - b co-operation with employer
 - c not to endanger self or others
- 4 identify the main legal requirement for the use and disposal of hazardous substances
- 5 identify types of substances that are classified “hazardous to health”
- 6 state typical health and safety responsibilities of employees (including the care of visitors to an organisation) in relation to
 - a fire procedures and evacuation
 - b accident reporting procedures
 - c special safety features of the site
 - d actions to be taken in an emergency
- 7 explain the difference between a hazard and a risk

Underpinning knowledge continued

- 8 state the steps needed to carry out a risk assessment by identifying eg
 - a hazards and risks
 - b who might be harmed and how
 - c likelihood of harm occurring
 - d what control methods need to be taken
 - e who would be responsible for putting the controls into practice and when
- 9 identify common hazards and risks associated with
 - a use and maintenance of equipment
 - b clothing and jewellery during maintenance activities
 - c use of materials or substances
 - d working practices that do not conform to health and safety procedures
 - e unsafe behaviour
 - f accidental breakage and spillage
 - g environmental factors
 - h hazardous voltages
 - j workshop tools
- 10 state the principles of safe use and manual handling for
 - a various tools
 - b lifting/moving base units, monitors, printers etc
 - c ICT workstation furniture
- 11 explain safety factors to be considered while using a PC
 - a workstation ergonomics
 - b Injuries caused by the repeated use of a PC
 - c eye strain due to incorrect monitor settings
- 12 state the importance of using a correctly rated fuse and identify how to select the correct fuse for various items of ICT equipment
- 13 state the reasons for and the importance of portable appliance testing (PAT)
- 14 identify correct fire extinguishers for use on different types of fire
 - a powder for fires involving freely burning materials, petrol & oils, gas & electrical equipment
 - b water for tackling freely burning materials such as paper, cloth, wood and furniture
 - c Foam for fires involving volatile liquids and freely burning materials such as paper, cloth, wood and furniture
 - d CO2 for fires involving an electrical risk like computers, office equipment and generators

Underpinning knowledge continued

- 15 describe ESD
 - a what is static electricity and electro-static discharge (ESD)
 - b how is static charge generated
 - c what materials can generate a static charge
 - d typical voltages in ESD
 - e effects of ESD on sensitive components
 - f types of damage caused by ESD (intermittent or partial failures, delayed failures, catastrophic failures)
 - g implications of ESD damaged equipment to an organisation
 - h static control devices (wrist strap, bench mat, coat, shoes, air ionisers)
 - j methods of controlling electro-static discharge in the working environment (charge prevention, grounding, shielding, neutralisation, education)
 - k importance of testing of anti-static protection devices.

Unit 401

Outcome 2

Maintain ICT equipment and systems 2

Identify failures in ICT equipment and apply appropriate fixes

Practical activities

The candidate will be able to:

- 1 gather accurate and relevant information on hardware failures eg
 - a base unit and internal parts
 - b keyboard
 - c mouse
 - d printer
 - e monitor
 - f scanner
- 2 diagnose causes of failures for the following ICT equipment
 - a video/sound
 - b monitor
 - c disk drives (optical media, hard drive)
 - d printer
 - e Network Interface Card (NIC)
 - f Cables
 - g system board/RAM/CPU
 - h power supply unit
 - j operating system and software applications
- 3 use diagnostic tools to identify faults eg
 - a operating system tools
 - b third party hardware and software diagnostics
 - c equipment self test facilities
- 4 apply corrective hardware maintenance (fixes) to PCs following established procedures and using recommended parts and materials
- 5 apply corrective software maintenance (fixes) to PCs following established procedures and using recommended materials
- 6 check and confirm that fixes have been carried out successfully
- 7 produce a system fault report
- 8 maintain corrective maintenance records.

Underpinning knowledge

The candidate will be able to:

- 1 identify available sources of information that can assist with failure analysis eg
 - a error messages
 - b failure log
 - c site documentation
 - d installation log (software and hardware)
 - e diagnostic utilities
 - f escalation procedure
- 2 identify typical corrective actions necessary to fix hardware and software faults
 - a repair
 - b replace
 - c upgrade
- 3 state the typical procedures for reporting corrective actions
- 4 identify typical sources of information on carrying out corrective maintenance eg
 - a websites
 - b manufacturers' service manuals
 - c locally produced service manuals
 - d escalation procedures eg referral to immediate supervisors, experienced personnel
- 5 describe types of resource required for corrective maintenance
 - a procedures
 - b availability of parts
 - c available time
 - d materials
 - e expertise
 - f support
- 6 describe steps needed to be taken before applying corrective maintenance eg
 - a confirmation with procedure and or parts lists in the manufacturer's or supplier's manual
 - b referral to locally produced service manual
 - c own knowledge of this or similar problem
 - d confirmation by supervisor or experienced colleague
 - e referral to the user
- 7 describe tests that can be used to check that corrective maintenance has been carried out successfully
- 8 state problems which may arise from the following
 - a faulty replacement parts
 - b unexpected unavailability of equipment from user
 - c failure of tests
 - d fault has changed

Underpinning knowledge continued

- 9 state who should typically be informed when problems arise during corrective maintenance
 - a colleagues
 - b supervisor/manager
 - c manufacturer
 - d customer
- 10 describe common systems for recording corrective maintenance
 - a locally kept records
 - b maintenance manual
 - c logs in the equipment itself
 - d remotely held records
- 11 describe why it is important to record corrective maintenance eg
 - a records can be referred to during any other corrective maintenance
 - b removes duplication of effort when fault-finding problems
 - c records the parts used
 - d can be accessed by the user to ascertain if contract/maintenance of equipment is being carried out
 - e to ensure service level commitments are being met.

Unit 401

Outcome 3

Maintain ICT equipment and systems 2

Apply preventative maintenance to ICT systems

Practical activities

The candidate will be able to:

- 1 apply preventative maintenance using the recommended procedures, materials and parts
- 2 maintain different types of hardware eg
 - a base unit
 - b PSU/CPU fan
 - c monitor
 - d keyboard/mouse
 - e printer/scanner
 - f hard disk (defragmenter/scan disk/clear unwanted files)
- 3 maintain function of hardware by applying software fixes eg
 - a anti-virus check/update
 - b software patches/bug fixes/upgrades
 - c driver updates
 - d disk/data backup
- 4 check the equipment to confirm that the preventative maintenance procedures have been carried out successfully
- 5 produce a report of problems encountered while carrying out preventative maintenance
- 6 maintain preventative maintenance records.

Underpinning knowledge

The candidate will be able to:

- 1 state the need for preventative maintenance
- 2 describe the importance of preventative maintenance for PCs and peripherals
- 3 identify where preventative maintenance procedures might be kept eg
 - a with customer
 - b with equipment
 - c customer response centre
- 4 state why preventative maintenance procedures have to be co-ordinated with the user
- 5 identify indicators that would show a need for preventative maintenance
 - a system initiated call
 - b following replacement of a component part
 - c locally kept records
 - d periodic records

Underpinning knowledge continued

- 6 state typical resources needed to carry out preventative maintenance eg
 - a availability of materials (for cleaning, routine replacement etc)
 - b tools and equipment
 - c manufacturers' service manuals
 - d locally produced service manuals
 - e escalation procedures
 - f guidance from supervisors or other experienced colleagues
 - g access to system
 - h time allocation
- 7 identify specific material resources required to carry out computer maintenance eg
 - a cleaning foam, cotton buds, compressed air
 - b antivirus software, drivers updates
 - c software updates and bug fixes
 - d third party utility programs
 - e different tools eg PC repair toolkit
- 8 state problems which may arise from the following
 - a faulty parts
 - b unavailability of customer's system
- 9 state who should typically be informed of problems when applying preventative maintenance
 - a colleagues
 - b supervisor/manager
 - c manufacturer
 - d customer
- 10 explain post maintenance procedures
 - a power on self test and other diagnostic routines
 - b system test
 - c failure reporting
 - d materials return - used, unused
- 11 compare common methods of recording the implementation of preventative maintenance procedures eg
 - a locally kept records
 - b maintenance manual
 - c logs in the equipment itself
 - d site log
- 12 explain a range of preventative maintenance procedures for different types of hardware and software.

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 Identify hazards associated with ICT equipment and reduce risks to systems and personnel	<input type="checkbox"/>	
2 Identify failures in ICT equipment and apply appropriate fixes	<input type="checkbox"/>	
3 Apply preventative maintenance to ICT systems	<input type="checkbox"/>	

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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