e-Quals Unit Syllabus

Level 2 PC technology
(7267-426)

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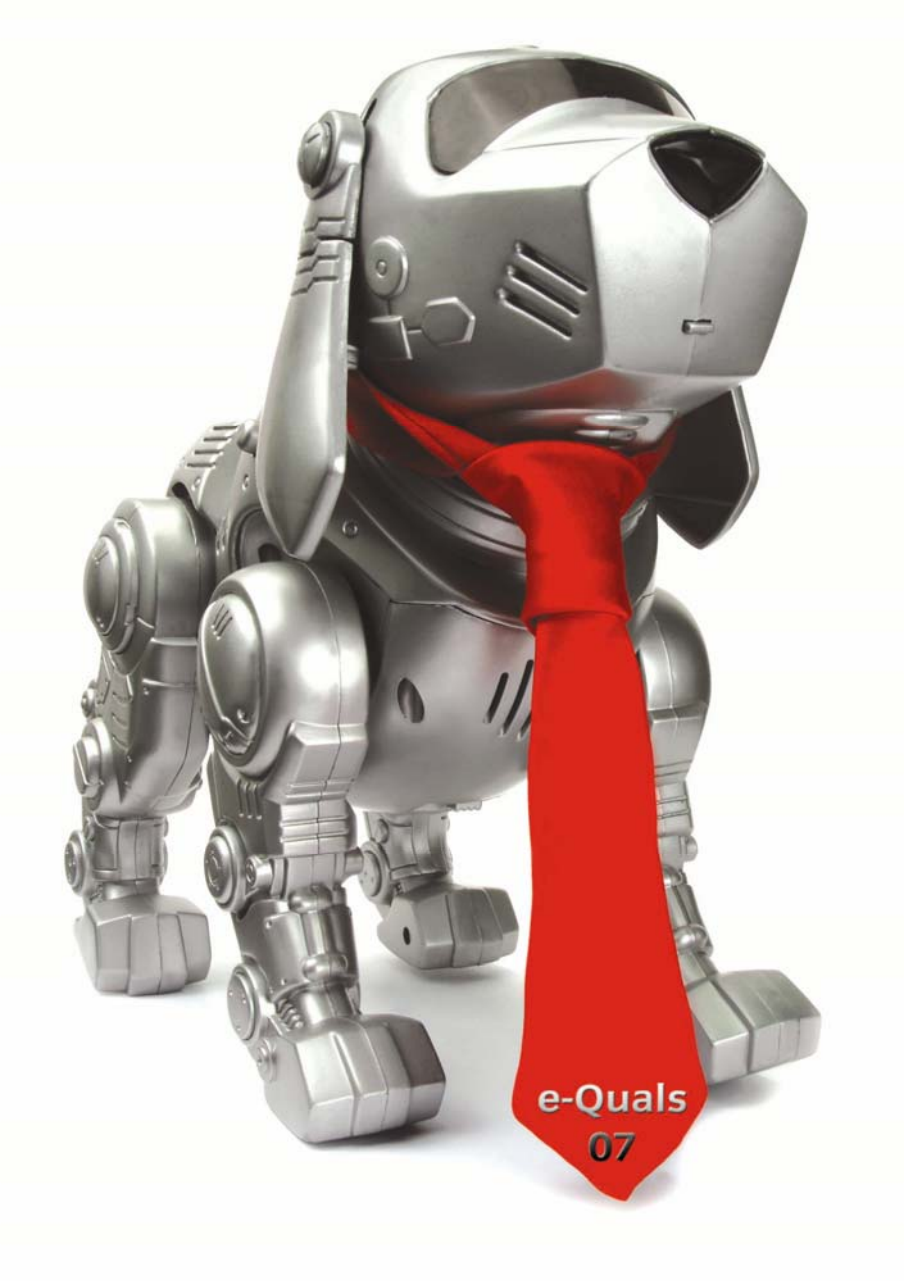

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Contents

Unit 426 PC technology

Rationale

This unit concerns the technology of personal computers

Learning outcomes

There are **four** performance outcomes for this unit. The candidate can demonstrate an understanding of:

- basic PC systems
- basic input/output devices
- data storage modules
- current printers.

Assessment and grading

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

Unit 426 PC technology

Outcome 1 Demonstrate an understanding of a basic PC system and apply this knowledge safely in a practical situation

Practical activities

The candidate will be able to:

1 test computer cables

2 install and commission a working stand-alone PC

3 carry out field service procedures for a system desktop/tower unit

Underpinning knowledge

The candidate will be able to:

1 identify aspects of personal computer developments and can
- a review early PCs and IBM developments
- b describe modular expansion provision
- c state the role of DOS

2 identify microcomputer systems and can
- a recognise a microcomputer system block diagram consisting of
  - i system desktop/tower unit
  - ii monitor
  - iii keyboard
  - iv input and output peripherals
- b state the function of system software
  - i BIOS
  - ii operating systems including Windows
- c operate in the Windows environment
- d describe serial and parallel data paths

3 identify the system desktop/tower unit and can
- a identify the composition of the system board
  - i microprocessor
  - ii memory
  - iii video slot/card
  - iv sound card
  - v I/O card
  - vi FDD and CD controllers
  - vii serial and parallel interfaces

b state power supply voltages and currents

c describe the function of the microprocessor

i basic specification

ii speed of operation

d define data and address bus widths

i byte as 8 bits

ii word as defined for a given system

4 identify forms of memory and can

a describe the function of RAM

b define cache memory

c define ROM

d state the function of floppy disk and hard disk

e define back-up

5 identify serial and parallel I/O and can

a distinguish between the following

i RS232

ii RS423

iii Centronics

b recognise serial and parallel cables for use in current PC systems

i ribbon

ii twisted

iii screened

iv connector types used in current PC systems

v methods of marking and coding

vi voltage limitations of cables

c describe procedures for cable testing

i continuity

ii substitution

iii automatic cable testing

6 identify installation and commissioning requirements for a stand alone (working) PC system comprising system processor unit, monitor, keyboard and mouse and can

a describe procedures for

i unpacking and preparation for use

ii removal of transit packing

iii removal of shipping packing from moving parts

iv choosing a place for the system processor unit

v making connections

vi repacking the system processor unit for transportation

b describe the initial processes
    i boot-up
    ii power on self test (POST)
c describe procedures for virus checking and clearing
d define the ‘Plug and play’ concept

7 identify flowcharts as an aid to diagnostics and can
a list flowchart symbols
    i start
    ii finish
    iii action rectangle
    iv decision box
b construct a simple diagnostic chart

8 identify field service procedures for a system processor unit and can
a state electro-static precautions to be observed when opening-up units
b state ac mains safety precautions
c initiate software diagnostic checks using built in software
d describe procedures for fault location and module replacement

9 identify procedures and practices for moving and storing loads in workshop and field servco and can
a define a load
b describe hazards associated with moving loads
    i back injury
    ii injury to hands and feet
c define the centre of gravity of a load
d explain the use of gloves
e describe the effect of load surface on grip
f explain the need to avoid injury to other people when moving a load
g describe how to minimise lifting
    i plan the move
    ii clear obstacles away
    iii use the most appropriate method
    iv adopt correct posture when lifting
h describe techniques for stable stacking of goods.

Unit 426 PC Technology

Outcome 2 Demonstrate an understanding of basic input/output device and apply this knowledge safely in a practical situation

Practical activities

The candidate will be able to:

1 install, test and clean a computer keyboard

2 install, test and clean a computer mouse

3 carry out routine maintenance and field service procedures on a monitor

Underpinning knowledge

The candidate will be able to:

1 identify the computer keyboard and can
- a describe the keyboard layout
- b state that pointing devices may be incorporated
- c state that each keystroke generates a unique code
- d recognise a keyboard cable
- e describe substitution test procedures for a keyboard
- f describe keyboard cleaning procedures

2 identify the computer mouse and can
- a describe how vertical and horizontal movements are digitised
- b recognise the mouse cable
- c describe procedures for mouse driver installation
- d describe test procedures for a mouse
  - i vertical and horizontal operation with and without the ball
  - ii testing by substitution
- e describe mouse cleaning procedures

3 identify computer monitor and display types and can
- a define display terms
  - i pixel
  - ii VGA
  - iii SVGA
- b describe the function of the graphics card
- c describe monitor picture construction
  - i aspect ratio
  - ii non interlaced scanning
  - iii refresh rate

d describe the colour triangle for additive mixing

e define terms related to colour

i hue

ii luminance

iii saturation

iv colour depth

f recognise a colour monitor block diagram

g state power supply ratings

h define the energy saving function

i state the function of each block

j define display distortions

i barrel

ii pincushion

4 identify the colour monitor cathode ray tube and can

a summarise the constructional features of colour CRTs

b describe aspects of CRT operation

i control of beam intensity and focus

ii electromagnetic deflection

iii typical electrode potentials

c state the need for convergence in colour CRTs

d list CRT faults

5 identify installation and commissioning requirements for a monitor and can describe procedures for

a unpacking and preparation for use

b choosing a place for the monitor

c internal adjustments

d menu-driven adjustments

e setting-up by means of a software package

6 identify routine maintenance requirements and field service procedures for monitors and can

a describe procedures for cleaning a monitor externally

b describe procedures for go/no go fault finding a monitor

c describe substitution test procedures for a monitor

7 identify the colour liquid crystal display for a notebook PC and can

a recognise a colour LCD

b define a cell

c distinguish between LCD types

i passive matrix

ii active matrix

8 identify health and safety aspects of visual display units and can state how VDU operation hazards may be reduced

- a eye strain
- b fatigue due to equipment
- c fatigue due to environment
- d fatigue due to posture.

Unit 426 PC Technology

Outcome 3 Demonstrate an understanding of data storage modules and apply this knowledge safely in a practical situation

Practical activities

The candidate will be able to:

1 carry out routine maintenance and field service procedures for a floppy disk drive

2 carry out field service procedures for a hard disk drive

3 carry out field service procedures for a CD ROM drive

Underpinning knowledge

The candidate will be able to:

1 identify the principles of operation and applications of 3.5 inch floppy disks and drives and can

- a describe magnetic recording of digital data
- b describe the construction of a floppy disk
- c state disk capacities
- d describe procedures for floppy disk formatting
- e outline the formatting process
- f recognise a floppy disk drive block diagram
- g identify FDD connecting leads
- h state the function of the disk controller
  - i list controller types
  - ii IDE
  - iii EIDE
- i identify the write protection method
- j describe environmental effects on floppy disks/drives both operational and in storage
  - i electromagnetic fields
  - ii electrostatic fields
  - iii ambient conditions

2 identify routine maintenance requirements/field service procedures for floppy disk drives and can describe procedures for

- a the use of a cleaning disk
- b operating system testing of disks and drives
- c removal of field replaceable FDD unit
- d reassembly and testing

3 identify the principles of operation and applications of hard disks and drives and can
   a state the purpose of a disk operating system
   b describe the construction of a hard disk
   c state typical hard disk capacities
   d describe procedures for hard disk formatting
   e outline the formatting process
   f recognise a hard disk drive block diagram
   g identify HDD connecting leads
   h state the function of the disk controller
      i list controller types
      ii IDE
      iii EIDE
   i distinguish between fixed and removable hard drive systems
   j describe HDD failure modes
4 identify field service procedures for hard disk drives and can describe field service procedures for
   a operating system testing of disks and drives
   b removal of field replaceable HDD unit
   c reassembly and testing
5 identify the principles of operation and applications of CD ROMs and drives and can
   a describe the read only disk
   b state the purpose of the laser
   c state CD ROM specification
      i storage capacities
      ii speed ratings
   d recognise a CD ROM drive block diagram
   e state the function of an IDE disk controller
   f identify CD ROM drive connecting leads
   g state health and safety aspects of working on a laser device
6 identify field service procedures for CD drives and can describe field service procedures for
   a testing disks and drives
   b removal of field replaceable CD ROM drive unit
   c reassembly and testing.

Unit 426 PC Technology

Outcome 4 Demonstrate an understanding of current printers and apply this knowledge safely in a practical situation

Practical activities

The candidate will be able to:

1 install and commission a printer.

2 carry out routine maintenance and field service procedures on a printer.

Underpinning knowledge

The candidate will be able to:

1 identify the principles of operation and applications of the black inkjet printer and can
- a describe the inkjet (bubble jet) principle
- b recognise the ink cartridge
- c describe print head movement
- d state the method of paper handling
- e state output specification
  - i printing speed (characters/second)
  - ii printing mode (dpi)
- f identify printer connections
  - i mains cable
  - ii printer cable
- g state printer power supply specification
- h identify and use suitable printer paper
  - i paper types
  - ii paper storage conditions
  - iii loading paper

2 identify installation and commissioning requirements for a printer and can
- a describe procedures for
  - i unpacking and preparation for use
  - ii removal of shipping packing from moving parts
  - iii choosing a place for the printer
  - iv making printer connections
  - v repacking the printer for transportation

b describe commissioning procedures
    i operation of printer controls
    ii installation of black ink cartridge for the first time
    iii installation of Windows printer driver
    iv printer self test

3 identify routine maintenance requirements and field service procedures for printers and can
    a describe procedures for
        i cleaning a printer
        ii cleaning the print head
        iii replacement of exhausted black ink cartridge
    b describe field service procedures for
        i using self diagnostics
        ii testing
        iii removal of field replaceable units
        iv reassembly and testing

4 identify the principles of the laser printer and can
    a outline the laser printer principle
    b make comparisons with the ink jet printer based on
        i initial cost
        ii cost per printed page
        iii print quality
        iv printing speed

5 identify procedures for correct disposal of waste materials and can
    a describe safe disposal of
        i sharp objects
        ii fluorescent tubes
        iii glass optic fibre offcuts
        iv cathode ray tubes
        v laser units
    b describe re-use or recycling opportunities
        i recycling of computer boards
        ii reclaim or recycling of packaging
    c state the customers right to retain waste materials from a repair or installation

6 identify employees' responsibilities towards the maintenance of field service safety and can
    a state the importance of safe driving of service vehicle
    b state the need for observing safe practices on customers' premises
    c ensure safety of repair or installation on completion
    d report accidents which occur in the field to employer

e report driving accidents to employer

HAS AWA 1976

Reporting of Injuries (RIDDOR) 1995

Notification of Accidents etc (1980)

Management of Health and Safety Regulations (1992).

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 Demonstrate an understanding of a basic PC system and apply this knowledge safely in a practical situation	☐	
2 Demonstrate an understanding of basic input/output device and apply this knowledge safely in a practical situation	☐	
3 Demonstrate an understanding of data storage modules and apply this knowledge safely in a practical situation	☐	
4 Demonstrate an understanding of current printers and apply this knowledge safely in a practical situation	☐	

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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