e-Quals Unit Syllabus

Level 3 PC Based Systems (7267-528)

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Unit 528 PC Based Systems

Rationale

This unit concerns the technology of personal computers.

Learning outcomes

There are **five** performance outcomes for this unit. The candidate will be able to demonstrate an understanding of :

- personal computer hardware
- personal computer software
- personal computer fault diagnosis and repair
- personal computer communications and networking
- basic customer care and apply this knowledge in a practical situation.

Assessment and grading

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

Unit 528 PC Based Systems

Outcome 1 Demonstrate an understanding of personal computer hardware

Practical activities

The candidate will be able to:

1 build a PC from supplied modules

Underpinning knowledge

The candidate will be able to:

1 a list the hardware elements of a computing system

b describe and compare the different processors used in PCs

c explain the need for, and use of, internal interconnecting busses

2 a state the main functions provided by the motherboard

b define integrated and plug-in types, and the limitations of each system

c explain the concept of 'plug and play'

3 describe how

i. memory is classified

ii. memory is configured and used in a PC

iii. a RAM cache works

iv. Windows uses memory

4 a describe, with the aid of a block diagram, the operation of current power supply units (PSU), to include

i. mains isolation

ii. on-off control

iii. protection devices

iv. electro-magnetic compatibility filter (EMC)

v. cooling fan and its functions

a describe how a PSU connects and is integrated into the system

b describe the voltages produced by the PSU

5 a describe the operation of disk storage systems

b describe how various hard disk configurations affect the performance of a hard drive

c identify the operating characteristics of different disk interfacing circuits IDE,EIDE, SCSI

d explain how the operating system uses a disk storage system

6 a define the principles of optical storage with reference to

i. how data is stored on a CD-ROM

ii. how data is read by the system

iii. DVD drive

b identify the operating specifications of a

i. CD-ROM drive interface

ii. CD-ROM read/write drive

7 a explain the use of magnetic tape as a bulk storage medium

B identify the operating characteristics of a

i. Zip drive

ii. Jazz drive

8 a state how graphics card performance is affected by bandwidth and memory size

b explain the

i. relationship between RAM required and display resolution and colour

ii. technology of CRT and LCD based display systems

9 a explain how a keyboard works, and how it communicates with the system

b define the concept of ergonomically designed keyboards

10 describe how the mouse interfaces with the PC

11 a identify the features and specification of

i. a sound card

ii. the MIDI interface

b compare FM synthesis and Wave Table sound generation

12 a outline the different types of parallel and serial ports

b describe the following technologies

i. inkjet printer

ii. laser printer

iii. colour printer

iv. image scanner

Unit 528 PC Based Systems

Outcome 2 Demonstrate an understanding of personal computer software

Practical activities

The candidate will be able to:

1 install an operating system and check that the set up for a printer and scanner works with specified application software

2 test the PC using diagnostic software

3 explore computer system files using the DEBUG program

4 demonstrate disk and file recovery techniques

5 use utility software to examine the operation of the hard drive

6 use utility software to examine the operation of the CD-ROM drive

7 demonstrate the Windows program and how to work in this environment

Underpinning knowledge

The candidate will be able to:

1 construct a flowchart to define a given task

2
- a explain the functions of an operating system
- b describe the installation process
- c describe memory allocation and start-up files of the operating system
- d compare operating system architectures
- e compare disk drive filing systems
- f explain the importance of using the correct country of origin driver

3
- a define key Windows terminology
- b explain the various types of
  - i. windows used in the Windows OS
  - ii. icons used in Windows programs
- c describe program installation, modification and upgrading methods
- d describe Windows troubleshooting techniques
- e explain Windows Icons Mouse Pointer (WIMP) technology

4
- a explain the use and handling of interrupts (IRQ)
- b explain the
  - i. way in which the system handles interrupts
  - ii. need to configure the interrupts of a system
  - iii. need to change DMA setting when a conflict occurs

Unit 528 PC Based Systems

Outcome 3 Demonstrate an understanding of personal computer fault diagnosis and repair

Practical activities

The candidate will be able to:

1 repair a PC by replacing faulty memory module

2 a identify and repair a PC video fault (monitor or card)

b repair or replace a connector using correct testing procedures

3 perform a Power-On Self Test (POST)

4 determine if the computer system has passed or failed the POST

5 locate faults in the system

i PSU

ii when no response occurs during the POST

6 determine the cause of faults in

a the motherboard

b RAM

c floppy disk drive

d hard disk drive

e monitor

f keyboard

g mouse

Underpinning knowledge

The candidate will be able to:

1 a explain the

i. limitations of fault diagnosis with conventional test equipment

ii. requirement for specialised test equipment

b list the functions of specialised test equipment

i. loop back connector (wrap plug) memory tester

ii. logic probe

iii. logic pulser

iv. logic clip

v. bus analyser

vi. POST card

2 a state which areas are tested by POST

b explain the fault area indicated by the audio signals emitted, or error codes displayed during the POST

3 describe the boot-up process of a PC

Unit 528 PC Based Systems

Outcome 4 Demonstrate an understanding of personal computer communications and networking

Practical activities

The candidate will be able to:

1 install and use networking software

Underpinning knowledge

The candidate will be able to:

1 explain the concept of the modem and its use in communication systems

2 list the advantages of Integrated System Digital Network (ISDN) compared to Plain Old Telephone System (POTS)

3 state the advantages and disadvantages of network topologies

4 explain, with the use of diagrams, the concept of

- i. LANs
- ii. WANs
- iii. the Internet

5 outline typical cabling methods

6 a identify USB interconnected hardware

b define the following protocols

- i. USB l
- ii. firewire

Unit 528 PC Based Systems

Outcome 5 Demonstrate an understanding of basic customer care and apply this knowledge in a practical situation

Practical activities

The candidate will be able to:

1 process documentation used in conjunction with servicing electrical and electronic equipment.

Underpinning knowledge

The candidate will be able to:

1 state the importance of using the customer's name, correctly spelt and with the correct form of address (Mr, Mrs, Miss, Ms)

2 a state procedures to be followed when responding to a service request
   - i. obtaining symptoms from the customer
   - ii. making a record
   - iii. importance of informative quotations provided promptly
   - iv. obtaining agreement to proceed with a repair or installation
   - v. presenting acceptance documentation

   b state procedures to be followed when carrying out a service
   - i. respect for customers' possessions and property
   - ii. keeping customers informed of progress
   - iii. damage caused by misuse and attempts at repair by others
   - iv. reporting unsafe situations

   c state procedures to be followed when completing a service
   - i. issuing informative invoices with terms of business explained
   - ii. methods for recording and responding to promises or proposals made to customers
   - iii. obligations under the terms of warranties
   - iv. warranty on repair
   - v. guarantees
   - vi. service agreements

3 explain how to deal with differences of opinion or a difficult relationship with a customer
   - i. expression of concern as a first response to the customer
   - ii. the negative outcome(s) of customer dissatisfaction

iii. extent of own authority in dealing with complaints

iv. when to seek assistance from others

4 a describe good telephone technique

i. avoiding over familiarity

ii. speaking to the right person

iii. leaving messages

iv. follow-up

b explain how to match communication to the customer's ability to understand

i. technical aspects of servicing and installation

ii. selective use of technical jargon

iii. customers with Particular Requirements

iv. calling for assistance where communication difficulties arise

c state the value of questionnaires for seeking feedback and revealing unsatisfied needs

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 personal computer hardware	☐	
2 demonstrate an understanding of personal computer software	☐	
3 demonstrate an understanding of personal computer fault diagnosis and repair	☐	
4 demonstrate an understanding of personal computer communications and networking	☐	
5 demonstrate an understanding of basic customer care and apply this knowledge 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** .....

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