Answer key

UNIT 1

Exercise 1

quality control finished products industrial process
production manager large-scale manufacturing
assembly lines raw material productivity levels

1 quality control
2 industrial process
3 raw material
4 productivity levels
5 finished products
6 assembly lines
7 large-scale manufacturing
8 production manager

Exercise 2

1 batch
2 assemble
3 outputs
4 purchasing
5 component
6 optimize

Exercise 3

a factory
b site
c layout
d fixtures
e equipment
f machinery
g workshops
h breakdowns
i maintain
j repair
k stock
l faulty

UNIT 2

Exercise 1

1 c 2 a 3 b 4 b 5 a 6 c

Exercise 2

workload	the amount of work that has to be done
workforce	all the people who work in a particular company
back order	an order from an earlier time which hasn't been produced yet
material flow	the movement of materials through a production system
throughput	the volume of goods that can be dealt within a certain period of time
output	the volume of goods which are produced
cycle	the series of activities following one another to produce a product
requirement	something that is needed for a particular process

Exercise 3

a demand
b make-to-stock
c to-order
d uncertainty
e forecast
f lead time
g lead time
h overtime
i backlog
j shift
k bottlenecks
l stock-outs
m slack
n idle

UNIT 3

Exercise 1

applied research	looking at how scientific theory can be used in practice
clinical research	looking at the effects of drugs or treatment on patients
pilot study	small-scale experiment
experimentation	the process of tests and trials to see what happens under different conditions
pure basic research	the study of pure scientific principles
product development	changing and improving a product to achieve the best possible result
innovation	a new technique or idea
analysis	the study of the parts and their relationship to one another

Exercise 2

1 analysis
2 analyst
3 analytical
4 innovative
5 inventor
6 invention
7 developers
8 developmental
9 developments
10 experimental
11 experimenter
12 experimentation

Exercise 3

a design
b innovative
c patent
d prototype
e engineers
f developmental
g experiment
h breakthrough

UNIT 4

Exercise 1

a statistics
b median
c mean
d mode
e distribution
f sampling
g random
h scale
i frequency
j 14.99
k 14.98
l 14.99

Exercise 2

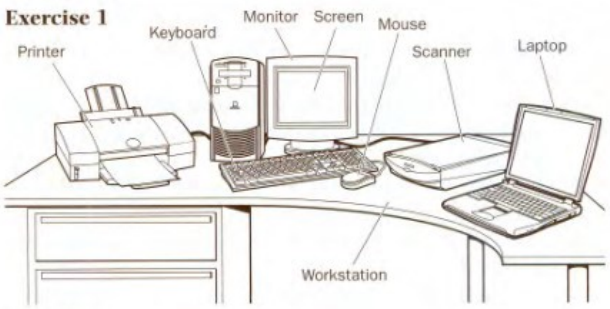
1 compiled
2 recorded
3 investigate
4 improve
5 search
6 find

Exercise 3

h g d e c a b f

UNIT 5

Exercise 1



Exercise 2

create files: to make new programs, utilities or documents
central processing unit: the principal microchip that the computer is built around
software products: these enable a computer to perform word processing, to create databases, and to manipulate numerical data
display information: a monitor will do this on a computer screen
digital data: this describes the format of 0 and 1 in which information is stored
expansion card: you plug this into a slot to add features such as video, sound, modem and networking
integrated circuits: when two or more components are combined and then incorporated into a single package
computer network: a group of electronic machines connected by cables or other means which can exchange information and share equipment (such as printers and disk drives)

Exercise 3

1 display information
2 digital data
3 software products
4 integrated circuits
5 create files
6 computer network
7 central processing unit
8 expansion card

UNIT 6

Exercise 1

1 b 2 a 3 c 4 a 5 c 6 b

Exercise 2

1 downtime
2 interconnected
3 transmitted
4 compatible
5 intranet
6 upload
7 connections
8 combine

Exercise 3

e a j d f b h i c g

UNIT 7

Exercise 1

1 d 2 f 3 g 4 a 5 b 6 i 7 c 8 e 9 h

Exercise 2

1 bill of lading
2 materials management
3 import
4 depot
5 package
6 cargo
7 channel
8 in transit
9 load
10 carriage

Exercise 3

a dispatched
b consignment
c carrier
d crate
e packing list
f delivery note
g shipped
h delivery
i warehouse

UNIT 8

Exercise 1

1 check
2 bar
3 detect
4 prevent
5 inventory
6 repair
7 failures
8 scrap
9 prioritize
10 value

Exercise 2

Let us consider what happened when Japanese cars were first imported into the UK and America.
Local manufacturers thought they were cheap and of low quality. But soon people noticed that they didn't break down as often as British or American cars.
At the same time, Japanese manufacturers started trying to meet customer needs in terms of style and design.
Customers were delighted with the new cars which exceeded their expectations.
The cars did more than simply satisfy customers' requirements, they provided value for money.

Exercise 3

a cause/effect
b improvement
c defective
d Pareto
e sampling
f monitor
g analysis
h prevent
i defects
j continuous
k zero

UNIT 9

Exercise 1

1 well-ventilated
2 wash
3 recycled
4 toxic
5 disposed
6 handling
7 cancer
8 defects
9 impaired
10 drains
11 Avoid
12 fumes

Exercise 2

1 protective
2 contamination
3 explosion
4 harmful
5 precautionary
6 occupational
7 dangerous
8 flammable
9 tightly
10 fumigation

Exercise 3

a risks
b goggles
c protection
d noise
e dust
f accidents
g smoke
h poisonous
i burns
j fumes
k drowsiness

UNIT 10

Exercise 1

anneal	to make materials tough by cooling them slowly, e.g. glass
anodize	to give a metal a protective coat by using it as an anode in electrolysis, e.g. car components
electroplate	to cover with a thin layer of metal using electrolysis, e.g. car components
forge	to shape metals by heating and then hammering, e.g. horse shoes
found	to melt metal and then pour it into a form, e.g. iron components
galvanize	to protect from rusting by coating in zinc, e.g. food cans
grind	to polish or sharpen by rubbing on a rough surface, e.g. stone
roll	to make thin sheets of metal by passing it between large rollers, e.g. steel
plate	to cover one metal with a thin layer of another, e.g. silver plate
soften	to make something softer, e.g. fibres
temper	to heat and then cool metals to obtain the required hardness and elasticity, e.g. steel

Exercise 2

1 chemical, chemists
2 industrial
3 mechanical
4 structural
5 harden
6 mining, miners

Exercise 3

a physics
b chemical
c civil
d highway
e electronic
f electrical
g mechanical
h develop
i production
j machines

UNIT 11

Exercise 1

e c i d h g a f b

Exercise 2

steering wheel	used by the driver to turn the car
exhaust manifold	carries waste gases to the exhaust pipe
radiator	cools water from the engine
fuel tank	holds fuel
brake line	connects the brake cylinder to the brakes
muffler/silencer	reduces the exhaust noise
battery	stores electricity
clutch	disconnects the engine from the gearbox while the gears are changed
differential	ensures that the rear wheels turn at a different speed to each other when a car corners
engine	provides the power
brake cylinder	holds brake fluid
accelerator	makes the car go faster when it is pressed
distributor	sends an electric current to the spark plugs
alternator	produces electricity