This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners’ meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.
1 (a) **Three** from: 
- database of UserIDs stored on system
- system checks entered User ID against database (of user IDs on server)
- when it finds a match it retrieves details such as passwords
- (when password entered), system allows access based on UserID
- ...and allocates privileges
- ...if server cannot find User ID, login is rejected

(b) **Three** from: 
- database of passwords linked to UserIDs stored on system
- system checks the password against database of passwords/stored passwords
- ...to check that the password is associated with the entered User ID
- if password found, login is completed
- if password is incorrect, user is asked to retype password
- if e.g. three failed attempts are made, then login is rejected for that User ID

2 (a) **Two** benefits from e.g.: 
- can access WLAN from anywhere within range/building
- ...can be mobile/move around
- ...can use same device anywhere in building
- can access same peripherals e.g. printers while mobile
- can use own devices
- ...at home and at school
- health/safety issue e.g. reduced trip hazard from trailing cables
- can have extended network coverage beyond the wired LAN

(b) **Two** drawbacks from e.g.: 
- security concerns
  ...WLANs must use security keys
  ...security key will be known to many
  ...less secure than a wired connection
  interference from other devices
  ...reduces data transfer rates leading to apparent slower speeds of e.g. web access
  increased distance from connection/access point
  ...low signal strength
- ...can lead to loss of connectivity
- bandwidth is lower than cabled networks
- ...reduces data transfer rates leading to apparent slower speeds of e.g. download
- ...large number of users can lead to slower rate of data transfer
3 (a) Tick as shown: [1]

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(b) Tick as shown: [1]

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(c) Tick as shown: [1]

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(d) Tick as shown:  

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4 Eight from: 

**CAD**
- design accurate drawings of bridge components
- ...using database/library of pre-prepared components to speed up design process
- component tested before produced
- ...under variety of conditions
- 3D views to allow walk-around/view final product
- total cost of a product can be calculated
- ...using a database of parts held by program

**CAM**
- Computer Aided Manufacture linked to computer system
- CAD generates a list of instructions
- ...for the manufacturing device/lathe/3D printer
to cut components to designed dimensions
- using LOGO type commands
to set the dimensions of the prototype

5 Two from:

- mainframes have high processing power/fast processing speed
- vast amount of data to be processed
- ...which would take too long if done by human/non-mainframe computer
- large number of rules/parameters to be processed

6 (a) Two from e.g.:

- parameters can be changed
- model can be tested to destruction
- tests can be repeated
- extreme conditions can be modelled
- no danger of hurting people
- no materials wasted
- can investigate the financial implications of different designs
(b) Two from e.g.: [2]

not all parameters can be modelled/tested so test is incomplete
the assumptions/rules of the model may be faulty/not accurate so test results may not be accurate
custom software is needed for large/complex models which maybe expensive/take too long to produce
need access to fast/mainframe for large/complex models which may be expensive

7 Two from: [4]

Gantt charts:
...show clearly the stages/tasks in project
...can be used as a communication device between team members
...permits time management of project
...allows flexibility in project management
...parallel and sequential tasks with appropriate examples can be represented
...progress of each task with appropriate example can be shown

Pert (Project Evaluation and Review Technique) Charts:
facilitates decision making
...number events sequentially to allow the later insertion of additional events
two consecutive events in a PERT chart are linked by activities
...represented as arrows
events shown in a logical sequence
...no activity can commence until its immediately preceding event is completed
milestones should be PERT events and decides their “proper” sequence
may have multiple pages with many sub-tasks
Critical path analysis
...to determine the most cost-effective/time-effective order of tasks
Event chain diagrams
events are shown as arrows
...names and/or IDs of events are shown next to the arrow
events with negative impacts (risks) are represented by down arrows
events with positive impacts (opportunities) are represented by up arrows
individual events are connected by lines showing the event chain
PRINCE
divides project into number of processes
uses common language so all can understand

Max 3 per feature

8 Three from e.g.: [3]
hiring (construction) workers
preparing the ground
building foundations
construct main supports
constructing bridge sections
delivery of bridge sections
testing of construction
project completion
9 Four from:
- disparities/gap
- ...between developed and developing countries/regions
- regarding access to computing/ICT
- regarding skills in computing/ICT
- regarding opportunities related to computing/ICT

One mark for valid example e.g. access to internet

10 Eight from e.g.:
- ICT skills enhance employment prospects
- people in some countries/regions may not have access to computers/IT facilities
- infrastructure, people in some countries/regions may not support computers/IT facilities
- people lacking ICT skills will not be employed so easily
- people lacking ICT skills will not be able to use ICT to search for jobs
- people lacking ICT skills will not be able to use ICT to apply for jobs
- people lacking ICT skills will not be able to use ICT to create CVs
- areas lacking ICT infrastructure will not be able to access advertising for jobs/job searches
- schools and colleges without ICT access cannot teach ICT skills
- richer schools have ICT facilities to teach their students so increasing the digital divide/providing employable skills for their students

11 Eight from e.g.:

Benefits:
- access to legal information from e.g. home
- no need to book an appointment with lawyer
- ...some people may be intimidated by lawyers
- ...reduced costs e.g. travel costs
- access to legal information without having to pay law firms
- can access the information whenever it is convenient
- access to information on family matters e.g. divorce, child care without visiting a lawyer
- access to advice on e.g. house purchases without paying estate agents fees
- access to changes in regulations and laws/updated regulations and laws
- online consultations with lawyers to get personalised advice

Drawbacks:
- legal advice may be misinterpreted/not understood
- online data may be deliberately altered to mislead
- unqualified people may use advice and mislead others
- individuals may not be able to find/make of all the relevant information

Max 6 for all benefits or all drawbacks
12 Five from e.g.:
areas with good access to ICT have better access to (online) health services
areas with poor access have reduced/no access to (online) health services
...not possible in areas without access to ICT
disabled people/valid example with ICT skills have increased access to health services
...those without the skills cannot get access health services without e.g. travelling
updated/general health information is available on the internet for those with ICT access
...those without ICT access are denied the health information updates

13 Four sensors from e.g.:
humidity to measure water in air
anemometer speed of wind
angle sensor direction of wind
tipping sensor rainfall
light sensor sunshine/light

14 Four from:
sensors to measure the variable when connected to patient
data from physical variables sent to computer system
...via ADC
e.g. breathing rate
computer analyses data/comparisons with pre-set data
displays results on monitor for viewing by nurses/doctors
computer produces alert/warning if physical variables go outside set parameters

15 Eight from e.g.:

Benefits:
automatic recording of data from patient for review
automatic chart production for reports/analysis by medical staff
remote monitoring of patient
...nurses can be alerted quickly
computers can monitor more than one variable per patient simultaneously
computers can monitor many patients at once
...nurses can supervise/watch over many patients at once
...nurses are freed up to other tasks
patients monitored 24/7
patients monitored continuously

Drawbacks:
patient does not get personal care
not all parameters may be monitored (e.g. blood sugar level)
alarm may be overlooked/ignored
cost of equipment purchase/maintenance
power failure/computer failure can cause loss of data/monitoring/affect patient safety

Max six for all benefits or all drawbacks.