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 October/November 2014 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.
1 (a) Four from:
- Named sensor such as light/infrared
- ...on satellite/NOAA/NASA/LANDSAT
- Data mining from existing research documents
- From expert geologists
- ...collected by appropriate method
- ...analysed and interpreted/entered into knowledge base [4]

(b) Two from e.g.:
- Soil type/type of soil in the location
- Chemicals in soil/soil composition
- Density of soil
- pH of soil
- Details/descriptions of any ores found
- Geological location of site
- Geological makeup/details/landscape of site [2]

2 Eight from:

Advantages:
- Contains the knowledge of many experts
- Provide permanent record of process
- Can enhance his own knowledge
- Produce results quicker/reduces time taken to produce results
- Fewer errors in work
- No need to check with other inspectors/geologists if in doubt over findings
- No need to carry/have access to paper records/information/reference books

Disadvantages:
- Can lead to demotivation/less thought process by operative
- Inspectors need to be trained to use the system
- Expert system follows rules while operative might have "insight"/use common sense
- Expert system does not easily adapt to new/different conditions
- Expert system needs to be up-to-date to provide the most useful information for the inspectors to use
- Updating may take the system offline and make it unavailable

Maximum 6 marks for all advantages or all disadvantages
One mark available for a reasoned conclusion. [8]

3 Three from:

Analysing the geology of an area/location
Analyse/interpret the records/data of observations
Create a model describing the geology of the area e.g. rock boundaries/faults/water flow
Create a 3D representation of the area showing rock formations/likely mineral deposits/fluid flow/oil in rocks/spaces between rocks [3]
4  (a) Receives and/or sends packets
   …to all devices connected to it
   Broadcasts data packets
   [2]

   (b) Direct flow of data packets to specific/individual devices connected to it
   Stores details of mac address of connected device(s) in order to direct packets
   …to attempt to avoid congestion on network
   [2]

   (c) Use radio waves
   …to connect into existing network
   [2]

   (d) To control data traffic
   To analyse traffic/checks (inspects) contents of data packets
   To allow or deny access by network traffic
   Blocks/allows IP addresses
   …comparses with block/allow list
   [2]

5  (a) Two from:
   http: Web browser on client/laptop sends http request message
   Company server sends http response/completion data to client/laptop
   Application layer protocol using IP/TCP to transfer data
   Web browser displays data using hypertext/markups in documents

   Two from:
   FTP: FTP client/application on laptop used to log in with user ID/password
   Active or passive FTP mode selected depending on company server settings
   Data type, e.g. ASCII/binary/EBCDIC, of data transfer determined
   Mode, e.g. Stream/block/compressed, of data transfer selected
   [4]

   (b) Four from e.g.:
   Encrypt the data before sending
   …using keys known only to him/recipient
   Use secure/encrypted connection via wireless/Wi-Fi/cable
   …use https connection
   …use SSL connection
   Avoid using public Wi-Fi hotspots
   …to try to ensure that signals are not intercepted
   Use secure VPN
   …to connect over public telecommunications systems
   [4]

   (c) Six from e.g.:
   Email for sending messages and attachments
   Electronic/video conferencing to discuss/share findings with other geologists
   Use instant messaging services to discuss findings with other geologists
   VoIP for voice phone calls findings with other geologists/report to offices
   VPN for connection into company network
   Webmail for email to sending messages and attachments/check messages
   FTP for uploading files/downloading documents
   [6]
6 (a) Six from:

Benefits:
- Customers do not need to travel to make a booking so save travel costs/time
- Customers can compare bookings with different companies
- Customers can make bookings from anywhere
- Customers can make bookings at any time
- Customers has instant confirmation available
- Reduced staff for branches/agents so saving money on salaries/wages
- Customer base not restricted by time zones

Drawbacks:
- Cannot authenticate customers for security purposes
- No personal contact with customers/agents
- Customers with special requirements may not be able to ask questions/get information online
- Do not have street presence to attract new customers
- Reliant on customers having internet access

Maximum 4 marks for all benefits or all drawbacks. [6]

(b) (i) The use of ICT/computer systems to intentionally deceive (others) for personal gain [1]

(ii) Four from, e.g:
- Personal identities can be stolen
- Money can be taken from bank accounts
- Goods can be intercepted
- Online tickets can be intercepted [4]

7 Eight from, e.g:
- Use of ICT/computer systems
- …to cause/inflict harm on others
- Deleting/amending/distributing personal data
- …gained from company/government databases
- Misuse of personal data
- …to gain access to services not entitled to
- …to distribute SPAM emails
- Spreading of viruses
- …to cause harm to files/data
- Cyberbullying
- …with use of social networks/email/text messages [8]

8 Two from:
- Create Gantt charts
- Create PERT charts
- …helps to identify the short and long term targets for the task of creating the software
- …helps to prioritise the tasks
- …helps to create a critical path [2]
9 Any **six** points from (max 3 problems and 3 solutions):

**Any 3 problems from:**
- Hackers attempting to access files and copy visitor credit card/personal details
- Unauthorised alterations to web site/customer details
- Security of data when customer details transferred/stored
- Uploading of virus to site
- Uploading of spyware
- Spammer obtaining email addresses and sending spam
- Denial of Service attack

**Any 3 appropriate solutions from:**
- Firewall to control access by computers
- Description of appropriate authentication technique
- Use of encryption of data when being transferred or stored/use of secure website/https/SSL
- Use of digital certification to verify website
- Use of **up to date** anti-virus application
- Use of anti-spyware software
- Use of spam filtering software
- Install a firewall, and configure it to restrict traffic coming into and leaving your computer  [6]
10 Methods from e.g.

Weblog:
Have a chronological record of postings
Perception of greater access
Can have multimedia elements
Consumes time to create and update
Unfiltered/uncensored

Emails:
Emails sent to registered subscribers
Send emails with information/attachments of newsletters

Website:
Information posted
Online questionnaires collect views

Forum:
Can be accessed from anywhere
Have a large audience
Wide range of users produces range of ideas and views
Usually only text-based
Malicious postings could be possible
Moderators/administrators can censor postings
Difficult to identify posters of malicious postings

e-Petitions:
Petition is set up on (government/politician) website
Petition checked for authenticity to ensure that
…there is not one already on that topic
…it does not contain confidential, libellous, false or defamatory statements
…it does not contain offensive, joke or nonsense content
Petition is available for anyone to sign

Social networks:
Use of social networks for “branding”/public image of politicians
Use for voter registration – collecting names of voters
Allow voters/supporters to express opinions/make comments on social network pages
Encourage voters/supporters follow/engage with politicians

[6]
11 (a) Two from:
   Use tele-conferencing to hold discussion  
   Members can log in at different times to post views/comments  
   [2]

(b) Six from:
   **Advantages:**
   Members can be from all over the world/anywhere/wider range of views or opinions available
   Timings do not have to take account of travel time
   Travel and accommodation do not have to be arranged or paid for
   Use of moderators to ensure appropriate language/tone of contributions
   Contributors cannot remain anonymous
   No need to employ staff/researchers so reduced costs

   **Disadvantages:**
   Organiser/moderator has less influence over the discussion
   Contributors/citizens need IT skills/access to IT facilities
   Interaction between organiser/moderator is reduced
   Members often contribute less online than face-to-face
   Reactions of members cannot be observed easily  
   [6]  
   [Total: 80]