Cambridge International AS & A Level

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APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY **9713/32**

Paper 3 Written B **October/November 2017**

MARK SCHEME

Maximum Mark: 80

Published

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.

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Question	Answer	Marks
1	***Four*** *from*: *Max* ***three*** *from:* Describes the behaviour of factors affecting Earth systems Using mathematical/differential equation models Earth/planet divided into 3D grid Appropriate example of type of model e.g. convective-radiative/ box/radiant heat transfer *Max* ***two*** *examples from climate drivers*: Atmospheric measurements used Oceans/seas temperature/flow/mass measured Ice masses measured in terms of mass/flow/movement/ temperature Land surfaces/land use for agriculture/(de)forestation Rainfall measurements/rising water levels/water tables Energy/electromagnetic radiation/heat/infrared/visible light from the sun Living organisms/ecosystems distribution on land/in water Cloud cover/type over land/sea areas.	**4**

Question	Answer	Marks
2	***Four*** *from e.g.:* Use of sensors connected to a data logging/computer system Via an ADC because computers cannot read analogue data Manual data collection by humans/data entry into computer system Temperature sensor to measure ambient/change in temperature Visible light sensor to measure (visible light) levels/intensity Infra-red sensor to measure radiant heat falling on surface/infrared light levels Humidity/moisture sensor to measure amount of water/moisture levels Water level sensor to measure height of sea/sea level/river level Sound sensor to measure seismic movements Airflow sensor/anemometer to measure airflow speeds/quantity CO_2 sensor to measure increase in CO_2 levels in atmosphere/water.	**4**

Question	Answer	Marks
3	***Four*** *from:* Start from a point in the past (e.g. 40 years ago)/using archive data Enter the data about the physical variables at that time Run the model to cover the time period up to present Compare the results/predictions from the model against what actually happened Repeat the process for different time periods Evaluate the predictions of the model.	**4**

Question	Answer	Marks
4	***Two*** *from:* Climate models only predict trends in weather patterns Averaged out over long periods of time measured in years Climate models and weather forecasts use different physicals variables Cannot predict specific values e.g. temperature at a particular point in time/time of day.	**2**

Question	Answer	Marks
5	***Two*** *from:* Numbers and text are stored as plain text/ASCII characters Arranged in a tabular format Each line of the table is a data record... ...with the same format Each field in the line/record is separated/delimited by a comma Each record/line ends in a carriage return/CR character.	**2**

Question	Answer	Marks
6	***Two*** *from:* Many software applications can import/export csv files/can support RFC 4180 file formats Most applications use their own proprietary format Proprietary format which cannot be used by other applications because of licencing/copyright issues.	**2**

Question	Answer	Marks
7	***Three*** *from e.g.:* Data in fields may contain a comma so parsing may be inaccurate/fields may not import correctly CSV files may use ‘tabs’ or ‘spaces’ or ‘semi-colons’ as delimiters even though the file format/extension says CSV Quotation marks may be required to enclose fields that contain commas but the fields may also contain embedded quotes CSV file format is not standardised (so files can contain alternative delimiters)... ...making parsing of the files inconsistent/difficult by applications.	**3**

Question	Answer	Marks
8	***Eight*** *from:* *Benefits:* Contains formatting instructions Is readable by humans if loaded into basic text editor Formatting codes are self-explanatory Plain text/ASCII characters in document are readable Can be used in a variety of word-processing applications No need for same application as originator *Drawbacks:* Use of extensive formatting can make document difficult to read File size is larger than plain text file Non-ASCII characters/slashes/dashes/quote marks must be specially encoded/'escaped'/used with control characters to change meaning of subsequent characters Non-Latin scripts/Chinese characters are not legible in RTF files Need to be converted from 7-bit RTF structure to 8-bit structure in some operating systems/Windows OS/Apple OS. *Max 6 for all benefits or all drawbacks.* *1 mark available for a reasoned conclusion.*	**8**

Question	Answer	Marks
9	***Six*** *from e.g.:* Effective connection distance is limited Obstacles in between WAP and device can further reduce connectivity Affected by positioning of WAP/height above ground/type of antenna in use Presence of other wireless devices/mobile (cell) phones transmitting on same/close frequencies Weather conditions affect the transmission of wireless signals Power output of device affects useable distance from WAP Lower bandwidth available compared to wired connections... ...wireless max 350Mbits/s but typically only 25Mbits/s c.f. wired at 1000Mbit/s Security based on encryption which adds an overhead to TCP/IP packets/processing Unsecured WAP allows access to anyone within range.	**6**

Question	Answer	Marks
10	***Six*** *from:* Use of virtual private networks (VPNs) Use of secure socket layer (SSL) protocol Use of encryption for traffic to/from networks to other networks VPN gateway set up as integrated firewall, anti-malware and intrusion detection system... VPN gateway to gateway connections create permanent links between office networks over internet... ...creates VPN tunnels over public telecommunication systems Use of network access control (NAC) so that all computers/devices meet company standards e.g. anti-malware, updates, configuration Use of network address translation (NAT) to 'hide' local IPs addresses.	**6**

Question	Answer	Marks
11	*Ways from e.g., max* ***three*** *per way:* Interception of data during its movement around/through the network... ...which is a passive attack using... ...e.g. port scanner software/packet sniffer software to capture/read packets Active attack using commands… ...to change the behaviour of the network from its normal behaviour ...designed to alter/delete network resources Social engineering attack/pretending to be e.g. IT technician/staff member... ....to manipulate other employees ....to perform actions that potentially cause damage to company resources Phishing attack using social engineering techniques to steal confidential information by sending bogus emails sent to employees... ...to direct them to malware infected websites/divulge confidential information.	**5**

Question	Answer	Marks
12	***Four*** *from e.g. :* Use of anti-virus software to scan incoming/outgoing email messages/attachments/files Regularly scan existing files for viruses/changes to file Restriction of software installation to authorised personnel Restrict the use of external storage devices by staff/users Restriction of connection to network of computer devices to only authorised devices Use of firewalls to prevent unauthorised data packets from entering the network from the internet/outside.	**4**

Question	Answer	Marks
13	***Six*** *from:* Allow customers to choose/select the time/date of performance Allow customers to choose/select the number of persons/adults/children tickets Allow customers to check the availability/position of seats Allow customers to select/check the price/price range of the different seats available Allow customers to reserve/book the seats/tickets at that price Automatically create/produce/issue (e)tickets for sending/posting/ emailing/make available for download/collection at automatic tellers Enable the verification /processing of payment for tickets Send confirmation emails to online customers Allow customers to make changes to the reservations/booking.	**6**

Question	Answer	Marks
14	***Eight*** *from:* *Advantages:* Bookings can be made at any time Seats can be reserved for a period of time e.g. 30 minutes while customer decides whether or not to go/have that seat Confirmation of the reservation/booking can be sent by mail/letter/SMS/ text message Customer can track tickets/have them sent by email/reserved at theatre/download at automatic teller at theatre so not lost/forgotten *Disadvantages:* Difficult to cancel after payment/reservation/booking has been made... ...loss of deposit/whole cost of the booking Customer can more easily make a mistake/reserve/book the wrong seats/time If the server is down/running very slowly/overwhelmed with customers trying to book, then bookings cannot be made... ....customer is dissatisfied/not sure if transaction is completed Payment verification/processing problems after the reservation/booking is made... ... reservation/booking may be cancelled/invalid Customer may have to wait for ticket to be sent by post... ...if booking close to the day of the event the tickets might not arrive in time. *Max 6 for all advantages/disadvantages.* *One mark is available for a reasoned conclusion.*	**8**

Question	Answer	Marks
15	***Four*** *from:* When seat is booked seat is flagged/locked while booking process proceeds Include a field/flag for 'booked'/equivalent... ...use Boolean data type indicating 'available' or 'unavailable'/ 'booked' Flag field as 'unavailable'/ 'booked' during period of time that customer is making booking/searching e.g. 10 minutes Flag field as 'unavailable'/ 'booked' when reserved by/sold to customer.	**4**

Question	Answer	Marks
16	***Six*** *from:* *Benefits:* Legal information is freely available to all/anyone with internet access Can research/find links to background information Can follow research/links to more detailed information Can allow people to see/know about updates in regulations/laws *Drawbacks:* Information may be inaccurate/not up to date/incomplete... ...due to summarising/poor explanations/not be in the precise legal terms ...not be written by legal professionals ...may not quote case law Inexperienced people can come to regard themselves as 'legal eagles'/experts. *Max 4 for all advantages/disadvantages.*	**6**

Question	Answer	Marks
17	***Six** from:* Ensure that accessibility issues/local laws/regulations are addressed with reference to their visual/motor/auditory/cognitive disabilities ...with reference to the content of the site as to how it operates/ is perceived by the user Provision of text alternatives for any non-text content... ...to allow change into other forms e.g. such as large print/braille/speech/ symbols/simpler language Provision of alternatives for time-based media/video/audio media Content can be shown in different ways without losing of information/structure e.g. simple/less complex layouts of text/lists/data Content separates foreground from background to make it easier to see/perceive Colour vision deficiencies should be catered for when choosing text/background colours Viewers should have sufficient time/control over the time that data is on screen/control over automatic moving on of data/screens so that they can read/use content All functionality should be available from a keyboard Content/flashing text/colours must be avoided to avoid causing seizures Guidance should be provided for navigation/content location/determining location on the website All web pages on the website must appear/operate in predictable manner Operation of the website and the content must be readable and understandable... ... assistive technologies (e.g. text-to-speech or vice versa) must be able to make sense of/use the content/navigation controls.	**6**