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INFORMATION TECHNOLOGY **9626/12**

Paper 1 Theory **March 2018**

MARK SCHEME

Maximum Mark: 90

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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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer		Marks
1	Knowledge is remembering a set of facts.	✓	**4**
	5, 10, 15, 20 are examples of information.		
	Knowledge is just learning items of data by rote.		
	Knowledge never requires the understanding of information.		
	Knowledge is the use of information to solve problems.	✓	
	Information is data that needs to be processed to give it meaning.		
	Understanding that 25 is the fifth answer in the five times table requires knowledge.	✓	
	Tacit knowledge is knowledge that is easy to pass on to someone else.		
	A list of all the books written by Shakespeare is just raw data.		
	Being aware that Pride and Prejudice was not written by Shakespeare requires knowledge.	✓	

Question	Answer		Marks
2	None of the web browsers currently in use support TLS.		**4**
	SSL stands for Secure Socket Layer.	✓	
	TLS was used before SSL came into being.		
	TLS and SSL are protocols that provide security of communication in a network.	✓	
	SSL uses asymmetric cryptography only.		
	Encryption protocols prevent hackers from intercepting a message.		
	TLS stands for Transport Layer Socket.		
	Client-server applications use TLS in a network to try to prevent eavesdropping.	✓	
	Encryption protocols enable credit card payments to be made securely.	✓	
	SSL does not require a handshake to be carried out.		

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Question	Answer	Marks
3	***Eight*** *from:* Open the holidays database Specify the new data source… …as being a text file …select/browse/type in the file name/newholidays.csv When given the option choose whether to import, append or link the data, choose import When asked to choose whether to append the data to an existing table, or to create a new table choose… …create new table When asked to choose which format, delimited or fixed width choose delimited format When asked to choose which delimiter, choose comma Specify exactly which data in the document is to be imported Indicate whether the first row contains column headings or whether it should be treated as data/specify field names Specify the data type of each field Choose whether to import the structure only, or the structure and the data together Choose a new primary key for the new table Name the new table newholidays or relevant name.	**8**

Question	Answer	Marks
4(a)	***Three*** *from:* A private (computer) network used within one organisation Can only be accessed by workers within the organisation/ restricted access network Based on internet technologies/TCP/IP protocols Used to share information within the organisation Tends to be a LAN.	**3**
4(b)	***Three*** *from:* A website that allows controlled access to authorised users to an organisation's network Usually only allows access to a subset of the information on the organisation's intranet Provides access to specific services without granting access to the organisation's entire network Usually operates within a VPN framework Usually operates over a public telecommunications network.	**3**

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Question	Answer	Marks
5	***Four*** *matched pairs from:* RSI in the fingers/wrists/carpal tunnel syndrome from continual typing/clicking of mouse Take a break every hour/take regular breaks/use wrist rests/use ergonomic keyboard Cubital Tunnel syndrome from prolonged use of mobile phones keeping elbow bent Use of headphones and microphone/use of Bluetooth headset/earpiece Headaches/eyesight problems from eyestrain caused by staring at the monitor for long periods Take regular breaks / focus on distant objects from time to time/use anti-glare screen Upper back/neck problems by continually staring at the monitor from below/above Position monitor at eye height and appropriate distance Lower back pain caused by sitting in same position for long periods Use ergonomic furniture/ sit up straight/use a back support/foot rests.	**8**

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Question	Answer	Marks
6	***Four*** *matched pairs from:* Instant messaging where Jasvir types a message and the parent immediately sees it pop up in their IM window There is no time to reflect on the message being sent unlike an email where the draft can be reviewed before sending /limited length of message/could be impersonal no voice/sound VoIP - Voice Over Internet Protocol Jasvir would use a microphone connected to a computer/speaks using a VoIP phone and the software converts it into a format that can be sent over the internet The person receiving the call must also have VoIP application running in order to listen/can be affected by bandwidth issues Social networking sites where Jasvir could post a message with pictures/video on his page/area Can later regret posting pictures or comments that were thought funny at the time/other people apart from parents may be able to see site thereby losing privacy/other people may message you interrupting flow Blog/microblog – Jasvir could use a website writing about what is happening to him May not get immediate feedback/parents will not have immediate feedback Chat rooms – Jasvir could meet his parents in a chat room and chat to them by typing a message Parents might not be skilled chatters and not know how to keep conversation private/other people apart from parents may be able to enter room thereby losing privacy.	**8**

Question	Answer	Marks
7	***Six*** *from:* Video-conferencing systems require digital compression of audio and video streams (in real time) The hardware or software that performs compression is called a codec... ... a coder/decoder Compression ratios of 50:1 are achieved The digital stream is subdivided into data packets... ...which are then transmitted through a digital network Each packet has a 'header' that identifies its contents Protocol used is usually determined by the need to have reliable or unreliable communications TCP is a protocol designed for error free transmission of data when delivery needs to be assured TCP will retransmit missing packets when data is lost TCP protocol can cause delays and reduced throughput User Datagram Protocol (UDP) is a less reliable protocol in which any data lost during transmission is not retransmitted Video-conferencing is better suited to UDP than TCP because packets that arrive late would spoil the conference.	**6**

Question	Answer	Marks
8	***Six** from:* *What has happened:* Column A contains numbers which are too long to fit in the cell so have been changed by the spreadsheet software to ###### Column B contains text which has a font size too big for the cells and the spreadsheet software has truncated the right hand side and bottom to fit the cell Column C contains decimal numbers which are too long to fit so the spreadsheet software has ignored the rightmost digits *Solution:* Click on top left corner to highlight all cells Double click on join/boundary between column headings Double click on join/boundary between row headings.	**6**

Question	Answer	Marks
9	=(A2+B2)*C2^ D2 **or** =(A2+B2)* POWER(C2,D2) (A2+B2)* with correctly positioned brackets 1 mark C2^D2 or POWER(C2,D2) 1 mark	**2**

Question	Answer	Marks
10	***Six** from:* G means grey, T means trousers waist 88 cm and leg length 78 cm G could stand for any colour beginning with G Better to have two or three letters such as GY, GN T could stand for top or T-shirt Better to have two (or three) letters such as TR, TO, TS Waist and leg length could be transposed Better to have W88 or 88W followed by L78 or 78L.	**6**

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Question	Answer	Marks
11	***Eight*** *from:* *Advantages of database software/Disadvantages of spreadsheet software* Complex filters are easier to create using database software such as names of workers working in a specific department who earn above a certain amount Queries can be saved using database software then used with updated data such as new workers joining the company Fields easier to name and query using database software such as name, address, rate of pay, wages Can only create a relational database using database software to relate a table of workers' payroll data to a table of personal details *Disdvantages of database software/Advantages of spreadsheet software* Calculated fields can be difficult to create using database software such as calculating wages Easier to create complex formulae in spreadsheets for calculating net wages after taxes, insurance, pension contributions Easier to use functions in spreadsheets such as countif to count the number of workers earning more than a certain wage Charts are easier to produce using spreadsheet software to show expenditure on wages over time Repeated data can be easier to enter using spreadsheet software Spreadsheets are easier to use to model different scenarios such as future wage expenditure. One mark is available for a reasoned conclusion. Must have at least two from each section to gain full marks.	**8**

Question	Answer	Marks
12(a)	***Six*** *from:* Studentid would be set as the primary key in the Students table Coursecode would be set as the primary key in the Courses table Studentid and Coursecode could form a compound key in the Students table (if required) Coursecode would be set as the foreign key in the Students table Studentid and Coursecode are primary keys as they contain unique data Studentid and Coursecode could form a compound key as they could collectively uniquely identify a record Coursecode is foreign key in the Students table as it is a primary key in the Courses table but appears as a field in the other table… …which is linked to that table.	**6**

Question	Answer	Marks
12(b)	***Six** from:* Select Student table Click on Create and select Query Wizard Choose Simple Query Wizard Select fields to be used Assign the name 'Biology Students' to the query Select Modify query design Under the field Coursecode… …in the criteria box type in B*/B115 Run the query.	**6**

Question	Answer	Marks
13	=MID(C1,4,LEN(C1)-8) MID(C1,) 1 mark 4, 1 mark LEN(C1) 1 mark -8 1 mark	**4**

Question	Answer	Marks
14	This question to be marked as levels of response: **Level 3 (7–8 marks)** Candidates will explain the advantages and disadvantages of magnetic tape and optical media using relevant and appropriate examples. The information will be relevant, clear, organised and presented in a structured and coherent format. There may be a reasoned conclusion/opinion. Specialist terms will be used correctly and appropriately. **Level 2 (4–6 marks)** Candidates will explain the advantages and disadvantages of magnetic tape and optical media. Examples used will be for the most part relevant. For the most part, the information will be relevant and presented in a structured and coherent format. There may be a conclusion/opinion. Specialist terms will be used appropriately and for the most part correctly. **Level 1 (1–3 marks)** Candidates will give the advantages/disadvantages of magnetic tape and optical media. Examples, if used, may lack relevance. There will be little or no use of specialist terms. **Level 0 (0 marks)** Response with no valid content. Candidates may make reference to e.g. A single magnetic tape stores more data than a single optical disk… …so more appropriate for server backups Single tapes cost more than a single optical disk… …so unlikely to be used by students to back up their work Tapes cost less per unit memory… …so more cost effective for large companies storing lots of data Optical disks are not quite as portable as a tape… …particularly where a large amount of data is stored requiring more disks Both last longer than the technology that reads them however Tape is corrupted if placed near to a magnetic field Optical disks have faster data access times… …so more suitable for non-backup purposes Magnetic tape is less susceptible to damage than optical discs during handling… …as it is completely encased Optical disks are more viable where there are large variations of temperature.	**8**