

# Markscheme

November 2016

**Information technology  
in a global society**

**Standard level**

**Paper 1**

15 pages

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Examiners should be aware that in some cases, candidates may take a different approach, which if appropriate should be rewarded. If in doubt, check with your team leader.

In the case of an “identify” question read all answers and mark positively up to the maximum marks. Disregard incorrect answers. In all other cases where a question asks for a certain number of facts eg “describe two kinds”, mark the **first two** correct answers. This could include two descriptions, one description and one identification, or two identifications.

It should be recognized that, given time constraints, answers for part (c) questions are likely to include a much narrower range of issues and concepts than identified in the markband. There is no “correct” answer. Examiners must be prepared to award full marks to answers which synthesize and evaluate even if they do not examine all the stimulus material.

### 1. Choosing a search engine

*Note to examiners.*

- *Part a and part b questions are marked using ticks and annotations where appropriate.*
- *Part c are marked using markbands. Use annotations and text comments to provide a rationale behind the marks you awarded. **Do not use ticks.***

- (a) (i) Identify **two** advantages to parents if their children use the *Disney* search engine. [2]

*Answers may include:*

- find legal content faster, more efficient
- will not unintentionally break piracy laws
- less likely to download illegal files containing malware or viruses
- websites more likely to have age-appropriate content / less likely to get inappropriate websites (eg adult content etc) listed in the search results.

*Award [1] for identifying an advantage of using a piracy free search engine up to a maximum of [2].*

- (ii) Identify **two** ways that the authenticity of a user may be determined. [2]

*Answers may include:*

- username and password
- two factor authentication (eg verification code sent via SMS etc)
- one time password (OTP)
- using digital signatures
- biometric authentication (eg fingerprint matching)
- answering a security challenge question.

*Award [1] for any of the points stated above up to a maximum of [2].*

- (iii) Identify **one** Boolean operator. [1]

*Answers may include:*

- AND
- OR
- XOR
- IF THEN
- EXCEPT
- NOT

*Award [1] for any of the points stated above.*

- (iv) State a Boolean search that would return the Mickey Mouse movies made in 1931. [1]

*Answers may include:*

- "Mickey Mouse" **and** "1931"
- "Mickey Mouse" AND "1931"

*Award [1] for the correct Boolean search.*

*Accept responses that omit the quotation marks ""*

- (b) (i) Explain **two** reasons why the *Disney* search engine would use cookies. [4]

*Answers may include:*

- keep users logged in, therefore more convenient than having to keep going through the same process or remembering the passwords
- keeps record of preferences such as language preferences allowing the website that loads to be configured to the user's requirements.

*Award [1] for each reason identified, and [1] for each appropriate explanation up to a maximum of [2] for each reason. Mark as [2] + [2]. Award a maximum of [4] for the answer.*

- (ii) Explain **one** reason why the *Disney* search engine would use authenticity as the key factor in ranking a website. [2]

*Answers may include:*

- *Disney* sees benefits of being associated with an ethical search engine which fits in with how they are perceived by the public
- the use of authenticity may make the search engine more efficient and promote the websites that should be at the top rather than the ones that may have used unethical practices. Providing better user experiences
- as the search engine is aimed at children and young people, it must ensure appropriateness and quality of content for this particular age group. This is aided by using authenticity as a key factor in ranking websites.

*Award [1] for a reason identified, and [1] for an appropriate explanation for that reason up to a maximum of [2] for the answer.*

- (c) Evaluate the decision by *Disney* to promote their search engine.

[8]

*Answers may include:*

**Benefits of *Disney* promoting their search engine**

- gives official site priority – rather than random sites
- will not list sites offering illegal copies of *Disney Movies* sites by ranking popularity
- search results will produce sites free of malware as top ranking would be authentic sites
- protects intellectual property – top ranking sites would be authorized
- searches will result in all official *Disney* resources being listed
- will bring more traffic to their official sites
- may force other search engines to encourage more ethical behavior
- reduces money lost by *Disney* as a result of piracy.

**Drawbacks of *Disney* promoting their search engine**

- may take up a considerable amount of time to develop for limited results
- the algorithm used by *Disney* may be easily circumvented by unethical website developers so will only have a limited period when it is efficient
- the algorithm used by *Disney* may be easily pirated by other search engine developers which may lead to other companies copying the lead
- *Disney* may not be able to obtain the intellectual property (IP) rights necessary to develop the search engine and give it long enough to become established before other search engines copy it
- there may only be a limited market for the *Disney* search engine
- the search engine might not be as accurate as other search engines
- there is no guarantee that the search engine searches the whole of the web.

*In part (c) of this question it is expected there will be a balance in the ITGS terminology between IT technical terminology and the terminology related to social and ethical impacts.*

***Please see generic markband information sheet on page 15.***

## 2. Restaurant automation

*Note to examiners.*

- *Part a and part b questions are marked using ticks and annotations where appropriate.*
- *Part c are marked using markbands. Use annotations and text comments to provide a rationale behind the marks you awarded. **Do not use ticks.***

- (a) (i) Identify **two** types of data that would be input into the restaurant's self-ordering kiosk system by a customer.

[2]

*Answers may include:*

- name
- items ordered
- quality ordered
- quantity ordered
- payment type preferred
- cash tendered
- tip
- credit card swiped for payment
- whether the items will be “eat-in” (customer seated in restaurant) or “take-away”
- customer telephone/mobile phone number.

*Accept the following data types:*

- text / varchar
- number / numeric.

*Award [1] for any of the types of data identified above up to a maximum of [2].*

- (ii) Outline **two** advantages to customers of the restaurant moving to a self-ordering kiosk or mobile ordering system.

[4]

*Answers may include:*

- less waiting time so you do not have to wait for server to place order
- more efficient so there are less errors with order, you enter your own items
- visually appealing as you can see what you are ordering
- items listed on the kiosk may have more information included than on a traditional menu (eg ingredients, calorie count, region the food comes from etc)
- can order remotely and pick-up the order when convenient (eg can get other things done while order is being prepared)
- may be easier for people who do not speak/understand Japanese to choose items from the self-ordering kiosk (eg pictures of the food/multi-language translations etc)
- customers can compare menus/prices etc between different restaurants offering the self-ordering system
- customers can choose items without feeling under pressure from restaurant staff or other customers waiting in line.

*Award [1] for identifying an advantage. Award an additional [1] for an explanation of that advantage up to a maximum of [2].*

*Mark as [2] + [2].*

- (b) Explain **three** reasons why a customer may be uncomfortable about sharing their personal information with a third party to obtain the HK loyalty card.

[6]

*Answers may include:*

- data may be shared with a third party who, may then use the data in many ways that the customer is not aware of or may object to leading to privacy issues (“who has access to the data?”)
- may receive too many emails or spam messages as a result of third parties having links with advertisers (as a source of revenue)
- collection and analysis of data – can result in the accumulation of vast amounts of information about eating preferences / personal details of the customer. Implications include purchases being investigated by police or customer targeted by criminals
- customers might feel uncomfortable because their location might be tracked when they use the loyalty card
- customers may feel uncomfortable with the storage of data – insecure storage may result in unauthorized access to personal data by employees or hackers breaking into the database.

*Award [1] for each reason identified and [1] for an explanation of that reason up to a maximum of [2]. Mark the first three reasons identified. Mark as [2] + [2] + [2].*

*The maximum mark for this question is [6].*

- (c) Discuss the advantages and disadvantages of restaurants joining the HK loyalty card programme.

[8]

*Answers may include:*

**Advantages**

- customers will visit restaurant more often to earn rewards – increases repeat business
- increased number of customers – customers like bargains/free meals
- increased sales – customers will spend more if they have rewards to spend/collect more loyalty card points
- can improve customer knowledge – collecting customer information about their spending habits.

**Disadvantages**

- initial cost to setup and install systems – can be expensive
- maintenance/upgrades of system is ongoing
- customers may not want to share their data – feel like they are being stalked
- may decrease revenue if giving away free items as rewards for the program
- decisions may be based on the aggregated data rather than the pattern of sales at individual restaurants.

*In part (c) of this question it is expected there will be a balance in the ITGS terminology between IT technical terminology and the terminology related to social and ethical impacts.*

**Please see generic markband information sheet on page 15.**



### 3. Digital citizenship

*Note to examiners.*

- *Part a and part b questions are marked using ticks and annotations where appropriate.*
- *Part c are marked using markbands. Use annotations and text comments to provide a rationale behind the marks you awarded. **Do not use ticks.***

- (a) (i) Define the term “digital citizenship”. [2]

*Answers may include:*

- appropriate and responsible use of digital technologies
- safe and ethical use of digital tools
- ability to be a safe and productive citizen online
- awareness about implication of digital technologies such as digital commerce, digital law and digital security.

*Award [1] for any of the points stated above up to a maximum of [2].*

- (ii) Identify the steps required to produce the chart in **Figure 3** using spreadsheet software. [4]

*Answers may include:*

- input the data in the spreadsheet
- select data in columns
- click “create chart” button
- select graph type
- add data labels to graph
- add the title.

*Award [1] for each of the steps stated above up to a maximum of [4].*

- (b) (i) Explain **one** benefit to students of learning about digital literacy in schools. [2]

*Answers may include:*

- teaches responsible/appropriate use of technologies
- prepare students for society full of technology
- learn about inappropriate use and consequences
- develop understanding and skills in using digital technologies.

*Award [1] for identifying an advantage. Award an additional [1] for an explanation of the advantage up to a maximum of [2].*

- (ii) Explain **two** characteristics of a website that can be used to determine whether it is a reliable source of information.

**[4]**

*Answers may include:*

- author – a listed author – author is willing to stand behind the information presented, author is a recognized expert on the subject of the website
- date – allows readers to make decisions about whether that information is recent and not outdated
- sources – credible websites should cite the source of the information presented
- domain – domain such as .edu are reserved for colleges and universities, .gov is a government website – both are usually credible sources for information
- writing style – poor spelling and grammar are an indication that the site may not be credible
- quality of the sites the website links to – a website that contains many links to other high-quality/reliable sites is more likely to be reliable
- comments left by other visitors – where a website allows comments to be posted, endorsements / positive comments may indicate that the information on the site is reliable.

*Award **[1]** for identifying each characteristic and **[1]** for an explanation of that characteristic up to a maximum of **[2]**.*

*Mark the first two reasons identified.*

*The maximum mark for this question is **[4]**.*

- (c) To what extent can a school's acceptable-use policy (AUP) ensure that students will become responsible digital citizens?

[8]

*Answers may include:*

- gives students appropriate access to online resources at an appropriate age within a structured framework
- allows students to explore the online environment in a controlled manner
- provides parents with the confidence that the school is taking a responsible approach to the access of online resources
- provides parents with a “contract” that may make their child think about how they use the internet
- policies without a previous education campaign/involvement of stakeholders may not work
- teachers/students may feel they can ignore the policies because they do not apply to their situation (*eg* downloading copyrighted videos to use in class because the school has insufficient bandwidth to stream them)
- digital citizenship policies are only as effective to the extent which all the stakeholders in the school community agree to follow them (*eg* students, teachers, parents, administrators etc)
- acceptable-use policies are only effective if policed by the school
- acceptable-use policies are limited to the school environment/network. Students may not follow the same practices outside the school / the policies might have limited overall effect on the students' development as responsible digital citizens
- by exemplifying / enforcing responsible use in school, acceptable-use policies may have a wider influence on students / promote good habits even when students are not constrained by the policies
- the school may use technical solutions to support responsible use (*eg* blocking certain social networking sites, monitoring students network activities) which prevents students developing the skills to appropriately navigate the World Wide Web.

*In part (c) of this question it is expected there will be a balance in the ITGS terminology between IT technical terminology and the terminology related to social and ethical impacts.*

***Please see generic markband information sheet on page 15.***

#### 4. Virtual dressing rooms

*Note to examiners.*

- All part a questions are marked using ticks and annotations where appropriate.
- Part b and part c are marked using markbands. Use annotations and text comments to provide a rationale behind the marks you awarded. **Do not use ticks.**

- (a) (i) Define the term “virtual reality”. [2]

*Answers may include:*

- artificially created environment with interactive software/hardware
- simulation of real environment
- computer simulation using 3D graphics.

*Award [1] for any of the points stated above up to a maximum of [2].*

- (ii) After an image of the shopper has been created. Identify the steps the shopper would take when purchasing the dress using the “virtual dressing room” software. [4]

*Answers may include:*

- user has image taken by Kinect
- user selects the dress from the database/catalogue
- shopper views/assesses the dress superimposed into their image
- virtual dressing room system superimposes the dress onto image of the user
- user decides whether to purchase the dress, or not
- if the dress is not suitable the user discards the dress and selects another
- user continues to try on dresses until she finds one she wishes to purchase, or not
- shopper adds chosen dress(es) to their basket
- shopper enters/confirms their purchase details (eg delivery address, type of delivery, payment method, discount codes etc)
- shopper confirms purchase (eg clicks a “place order” button etc).

*Award [1] for any of the points stated above up to a maximum of [4].*

- (b) Analyse whether the software linked to the “virtual dressing room” should be made compatible with other platforms, such as *Apple*.

[6]

*Answers may include:*

**Benefits of developing cross platform formats**

- more shoppers would be able to access the software if available on multiple platforms – could generate more revenue
- if the development team is larger there is more chance that once the software is launched it will be able to evolve more rapidly.

**Drawbacks of developing cross platform formats**

- proprietary software is quicker to develop for one platform – easier to upgrade, there is more work and cost associated with creating software for multiple platforms
- may be able to gain a monopoly position in the market before other software developers have had an opportunity to develop similar software
- it may not be economically viable as there may be a limited market for this type of software.

**[0]:** *No knowledge or understanding of ITGS issues and concepts. No use of appropriate ITGS terminology.*

**[1–2]:** *A limited response that indicates very little understanding of the topic or the reason is not clear. Uses little or no appropriate ITGS terminology. No reference is made to the relative advantages and disadvantages of developing cross platform formats. The response is theoretical.*

**[3–4]:** *A description or partial analysis with limited knowledge and/or understanding of the relative advantages and disadvantages of developing cross platform formats. Some use of appropriate terminology relating to the topic. Some reference is made to the scenario in the stimulus material.*

**[5–6]:** *A thorough examination with a detailed knowledge and understanding of the relative advantages and disadvantages of developing cross platform formats. An analysis that uses appropriate ITGS terminology. Explicit and relevant references are made to the scenario in the stimulus material.*

- (c) Discuss the impacts on shoppers **and** local clothing shops of bringing the “virtual dressing room” into people’s homes.

[8]

*Answers may include:*

- reduced returns rate – local shops who have joined the virtual dressing room system may save money
- reduced returns rate – can save company money
- more convenient/time saving for shoppers as they can try items on from the comfort of their own home
- fewer marketing opportunities for local shops – shoppers will not see in store sales and sales persons
- increased sales – shoppers more likely to purchase more from the comfort of your own home
- local shops may need fewer employees – do not have to employ as many salespeople, reduces cost
- may lose shoppers – some shoppers do not have equipment/technology – may not be able to shop online and go elsewhere
- increased access to shoppers – can reach shoppers who would not normally travel to store – can sell to people who normally would not be able to visit the store
- reduce theft – online shopping eliminates in-store theft
- reduces the social element of shopping, many people view shopping as a social experience/can share images of different outfits
- virtual dressing room software may not completely replicate the experience of buying goods in a shop
- local stores might have to pay to subscribe to the virtual dressing room system/online store – represents additional cost to the stores who opt-in to the scheme
- local stores who join the virtual dressing room might have to have digital versions of their stock created – additional cost/time
- local stores joining the virtual dressing room may be obliged to deliver the goods ordered through the online store / may incur additional costs (postage etc)
- shoppers will not be able to assess the quality of the dresses when using the virtual dressing room (only their look) / may be dis-satisfied if the dresses are of poor quality manufacture.

*In part (c) of this question it is expected there will be a balance in the ITGS terminology between IT technical terminology and the terminology related to social and ethical impacts.*

**Please see generic markband information sheet on page 15.**

**SL and HL paper 1 part (c) and HL paper 3 question 3 markband**

<b>Marks</b>	<b>Level descriptor</b>
<b>No marks</b>	<ul style="list-style-type: none"> <li>• <i>A response with no knowledge or understanding of the relevant ITGS issues and concepts.</i></li> <li>• <i>A response that includes no appropriate ITGS terminology.</i></li> </ul>
<b>Basic 1–2 marks</b>	<ul style="list-style-type: none"> <li>• <i>A response with minimal knowledge and understanding of the relevant ITGS issues and concepts.</i></li> <li>• <i>A response that includes minimal use of appropriate ITGS terminology.</i></li> <li>• <i>A response that has no evidence of judgments and/or conclusions.</i></li> <li>• <i>No reference is made to the scenario in the stimulus material in the response.</i></li> <li>• <i>The response may be no more than a list.</i></li> </ul>
<b>Adequate 3–4 marks</b>	<ul style="list-style-type: none"> <li>• <i>A descriptive response with limited knowledge and/or understanding of the relevant ITGS issues and/or concepts.</i></li> <li>• <i>A response that includes limited use of appropriate ITGS terminology.</i></li> <li>• <i>A response that has evidence of conclusions and/or judgments that are no more than unsubstantiated statements. The analysis underpinning them may also be partial or unbalanced.</i></li> <li>• <i>Implicit references are made to the scenario in the stimulus material in the response.</i></li> </ul>
<b>Competent 5–6 marks</b>	<ul style="list-style-type: none"> <li>• <i>A response with knowledge and understanding of the relevant ITGS issues and/or concepts.</i></li> <li>• <i>A response that uses ITGS terminology appropriately in places.</i></li> <li>• <i>A response that includes conclusions and/or judgments that have limited support and are underpinned by a balanced analysis.</i></li> <li>• <i>Explicit references to the scenario in the stimulus material are made at places in the response.</i></li> </ul>
<b>Proficient 7–8 marks</b>	<ul style="list-style-type: none"> <li>• <i>A response with a detailed knowledge and understanding of the relevant ITGS issues and/or concepts.</i></li> <li>• <i>A response that uses ITGS terminology appropriately throughout.</i></li> <li>• <i>A response that includes conclusions and/or judgments that are well supported and underpinned by a balanced analysis.</i></li> <li>• <i>Explicit references are made appropriately to the scenario in the stimulus material throughout the response.</i></li> </ul>