



MARKSCHEME

SPECIMEN PAPER

INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY

Higher Level and Standard Level

Paper 2

Using assessment criteria for external assessment

For external assessment, a number of assessment criteria have been identified. Each assessment criterion has level descriptors describing specific levels of achievement, together with an appropriate range of marks. The level descriptors concentrate on positive achievement, although for the lower levels failure to achieve may be included in the description.

Examiners must judge the externally assessed work at SL and at HL against the four criteria (A–D) using the level descriptors.

- The same assessment criteria are provided for SL and HL.
- The aim is to find, for each criterion, the descriptor that conveys most accurately the level attained by the candidate, using the best-fit model. A best-fit approach means that compensation should be made when a piece of work matches different aspects of a criterion at different levels. The mark awarded should be one that most fairly reflects the balance of achievement against the criterion. It is not necessary for every single aspect of a level descriptor to be met for that mark to be awarded.
- When assessing a candidate's work, examiners should read the level descriptors for each criterion until they reach a descriptor that most appropriately describes the level of the work being assessed. If a piece of work seems to fall between two descriptors, both descriptors should be read again and the one that more appropriately describes the candidate's work should be chosen.
- Where there are two or more marks available within a level, examiners should award the upper marks if the candidate's work demonstrates the qualities described to a great extent. Examiners should award the lower marks if the candidate's work demonstrates the qualities described to a lesser extent.
- Only whole numbers should be recorded; partial marks, that is fractions and decimals, are not acceptable.
- Examiners should not think in terms of a pass or fail boundary, but should concentrate on identifying the appropriate descriptor for each assessment criterion.
- The highest level descriptors do not imply faultless performance but should be achievable by a candidate. Examiners should not hesitate to use the extremes if they are appropriate descriptions of the work being assessed.
- A candidate who attains a high level of achievement in relation to one criterion will not necessarily attain high levels of achievement in relation to the other criteria. Similarly, a candidate who attains a low level of achievement for one criterion will not necessarily attain low achievement levels for the other criteria. Examiners should not assume that the overall assessment of the candidates will produce any particular distribution of marks.
- The assessment criteria must be made available to candidates prior to sitting the examination.

Topic: Health

Criterion A — The issue and stakeholder(s)

[4 marks]

Describe *one* social/ethical concern related to the IT system.

Social/ethical concerns may include the following:

- privacy/security of patient information, for example, sensitive patient information stored on the website may be viewed by hackers
- reliability of the transfer of data, for example, patient data could be lost during transmission from the patient’s computer to the website
- reliability of the website where data is uploaded, for example, the web server could be unavailable preventing the upload of patient data.

Describe the relationship of *one* primary stakeholder to the IT system.

Primary stakeholders may include the following:

- diabetic patients, whose results are uploaded/stored
- medical staff: doctors and nurses who use this IT system for the care of diabetic patients.

Marks	Level descriptor
0	The response does not reach a standard described by the descriptors below.
1	Either an appropriate social/ethical concern or the relationship of one primary stakeholder to the IT system in the article is identified.
2	Either an appropriate social/ethical concern or the relationship of one primary stakeholder to the IT system in the article is described or both are identified.
3	Either an appropriate social/ethical concern or the relationship of one primary stakeholder to the IT system in the article is described; the other is identified.
4	Both an appropriate social/ethical concern and the relationship of one primary stakeholder to the IT system in the article are described.

Criterion B — The IT concepts and processes

[6 marks]

Describe, step by step, how the IT system works.

Answers provided in the article include the following:

- meter reads patient’s blood glucose level
- results are stored on the patient’s computer
- results are sent to *LivingWithDiabetes* website
- records are accessed by doctors and medical staff
- patients can access their own results.

Answers with additional information to that in the article may include the following:

- meter reads patient’s blood glucose level and this is uploaded to the patient’s computer using a cable via serial/USB port
- time of upload is recorded by the computer’s internal clock
- data is stored on the patient’s computer hard disk
- patient loads the *LivingWithDiabetes* website using an internet browser
- patient logs into *LivingWithDiabetes* website using a previously given login and secret password
- special file transfer software is provided by *LivingWithDiabetes* to allow the patient to upload results
- results are stored in a database on the *LivingWithDiabetes* website
- relevant health practitioners/medical staff are given a login and password to access the results on the *LivingWithDiabetes* website
- results are analysed/manipulated to see changes in patient’s condition.

Explain the relationship between the IT system and the social/ethical concern described in Criterion A.

Answers may include the following:

Privacy may be an issue if data is not properly secured, for example:

- if data is intercepted by hackers during transfer of results from the patient’s computer to the *LivingWithDiabetes* website
- if passwords are not used on the *LivingWithDiabetes* server and unauthorized access is possible.

Reliability would be a concern if:

- there is a malfunction of the meter when reading the blood glucose level
- there is an error during transmission resulting in incorrect data transfer
- the web server is down and the results cannot be uploaded.

Candidates are expected to make reference to relevant stakeholders, information technologies, data and processes. Candidates will be expected to refer to “how the IT system works” using appropriate IT terminology.

Marks	Level descriptor
0	The response does not reach a standard described by the descriptors below.
1–2	There is little or no understanding of the step-by-step process of how the IT system works and does not go beyond the information in the article. The major components of the IT system are identified using minimal technical IT terminology.
3–4	There is a description of the step-by-step process of how the IT system works that goes beyond the information in the article. Most of the major components of the IT system are identified using some technical IT terminology. The relationship between the IT system referred to in the article and the concern presented in criterion A is identified, with the some use of ITGS terminology.
5–6	There is a detailed description of the step-by-step process that shows a clear understanding of how the IT system works that goes beyond the information in the article. The major components of the IT system are identified using appropriate technical IT terminology. The relationship between the IT system referred to in the article and the concern presented in criterion A is explained using appropriate ITGS terminology.

Criterion C — The impact of the social/ethical issue(s) on stakeholders**[8 marks]****Evaluate the impact of the social/ethical issues on the relevant stakeholders.**

Patient advantages may include the following:

- fewer errors compared with manual recording of results – greater accuracy leads to better treatment
- patients get better feedback on their blood glucose levels – they will be better-informed about their health and able to manage their disease more effectively
- records are archived – past records can be easily accessed
- fewer visits to the doctor/hospital – if levels are acceptable there would not be a need to visit the doctor as often.

Patient disadvantages may include the following:

- lack of security of sensitive medical data – hackers may intercept and interpret the results during transfer resulting in an invasion of privacy
- reliability of the equipment – leading to errors during data transfer
- reliability of the web server – results cannot be uploaded if the server is unavailable
- difficulty using the equipment – patients may not be computer literate and will need to learn how to upload results
- cost of the meter and internet access – will the patient be assisted with this expense?

Health workers' advantages may include the following:

- ability to graph results – enables health workers to easily check patients' results and see changes in blood glucose levels over time
- database features such as sorting, searching and reporting – allow manipulation of patients' results
- less pressure on busy medical staff – patients are entering their own results
- less interruption to the nurses during a working day – results can be viewed at anytime.

Health workers' disadvantages may include the following:

- liability if the web server is down or there is a malfunction of the equipment – diabetes is a serious disease and the doctors/hospital may be held responsible if there are reliability issues
- need for training to use this new technology.

If the evaluation does not provide any additional information to that in the article, the candidate will be awarded a maximum of [2 marks].

Marks	Level descriptor
0	The response does not reach a standard described by the descriptors below.
1–2	The impact of the social/ethical issues on stakeholders is described but not evaluated. Material is either copied directly from the article or implicit references are made to it.
3–5	The impact of the social/ethical issues on stakeholders is partially analysed, with some evaluative comment. Explicit references to the information in the article are partially developed in the response. There is some use of appropriate ITGS terminology
6–8	The impact of the social/ethical issues on stakeholders are fully analysed and evaluated. Explicit, well-developed references to information in the article are made appropriately throughout the response. There is use of appropriate ITGS terminology.

Criterion D — A solution to a problem arising from the article

[8 marks]

Evaluate *one* solution that addresses at least *one* problem identified in *Criterion C*.

Answers may include the following:

Solutions to the problem of reliability:

- ability to manually enter/change results on the website will overcome reliability problems with the blood glucose meter
- online tutorials/help files, email support, phone support will assist if reliability problems are associated with user error
- alternatives such as phoning in results if the server is down
- strict backup routines and disaster recovery programs will allow data to be reinstated should a server crash.

Solutions to the problem of security/privacy:

- encryption of data on the server will help ensure that data is not accessible by unauthorized people
- encryption of data during transfer will help secure data from attack during transmission
- levels of password/biometrics will help ensure that data is only accessible to permitted health workers.

Solutions to the problem of cost to patients:

- health insurance/medical benefits may allow patients to claim back cost of the meter and internet access.

Solutions to the training issues for health workers:

- various types of training could be provided, for example, training workshops, video tutorials loaded onto the hospital intranet.

If the evaluation does not provide any additional information to that in the article, the candidate will be awarded a maximum of [2 marks].

Marks	Level descriptor
0	The response does not reach a standard described by the descriptors below.
1–2	One feasible solution to at least one problem is proposed and described. No evaluative comment is offered. Material is either copied directly from the article or implicit references are made to it.
3–5	One appropriate solution to at least one problem is proposed and partially evaluated. The response contains explicit references to information in the article that are partially developed. There is some use of appropriate ITGS terminology.
6–8	One appropriate solution to at least one problem is proposed and fully evaluated, addressing both its strengths and potential weaknesses. Areas for future development may also be identified. Explicit, fully developed responses to the information in the article are made appropriately throughout the response. There is use of appropriate ITGS terminology.