Markscheme

November 2017

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.

Theme: Education and training

Criterion A — The issue and stakeholder(s) **[4]**

1. (a) Describe **one** social/ethical concern related to the IT system in the article.

[1]: for identification of the concern (which may not be explicitly named or incorrectly named or vaguely named).

[2]: there needs to be an explicit description of the impact/result/consequences/effect/outcome on the learner, professor or lecturer or MOOC administrator or university.

If two linked/overlapping concerns are identified eg privacy and security, mark the best response and that concern needs to be explained in (2)(b).

The description needs to reference the IT system in the article.

*If **two** different concerns are raised, only mark the first since the question specifies **one** concern; except if commonly linked eg security and privacy.*

Social/ethical concerns may include the following:

Reliability as learners cannot access the course:
- reliability of the IT infrastructure to access the course *eg* internet connection
- provision of bandwidth and the uptime of web servers by the universities.

Authenticity:
- inadequate methods of authenticating learners
- learners who complete courses and gain certification may not be who they say they are
- friends may complete the assignments on behalf of registered learners.

Privacy:
- use of data collected – this may be used for purposes unknown or without permission, learners may receive unwanted learning advice or targeted advertising or their information may be passed on to potential employers.

Surveillance:
- professors or learners may be tracked while participating on the course
- learners may not be aware of what information course managers are logging about them and feel uncomfortable about being monitored.

Lack of policies:
- lack of policies and guidelines could lead to different quality of online courses. This could lead to some learners not being satisfied with the course or the university's MOOC gaining a poor reputation
- lack of policies on how data is being collected could mean that personal data is not kept secure and private – could lead to unwanted advertising or if information is passed on to potential employers; learners may not be awarded jobs depending on how they participated.

Inequality of access / Digital citizenship:
- students may not have access to adequate bandwidth to enjoy the same learning experiences
- video lectures may take longer to load which make learning difficult and frustrating; learners may skip valuable resources because they cannot access them as easily
- online course may not be designed with accessibility in mind – making it difficult for the learners with disabilities to access the course materials
- the courses are mainly in English which is not accessible to a large number of people, and is costly to provide this service
- students do not have the necessary skills to operate a computer as may not have access to one or not educated to used one.
- Students do not have the hardware, software or operating system to run the applications required by the MOOC
- some universities cannot afford to implement a MOOC. Therefore there is a digital divide because of the economic differences between those institutions that can finance the interface of the course and those that are forced to follow the traditional method of teaching. So missing out on the benefits of implementing a MOOC
- some students may not have the necessary funds / money to have had access to computers and this has led to them having a lack of skills that enable them to successfully navigate online platforms such as MOOCs.

People and machines:
- certification on a course is not always recognized by employers – learners could spend time on a course which does not help them gain employment or give credit for other higher education courses
- high non-completion rates of learners – is a concern, because of lot of time, effort and money is spent creating courses that learners don't use. Time and effort of professors could be used more productively elsewhere
- learners find the courses impersonal because there may be thousands of learners and only one instructor/course manager
- with thousands of students it is difficult for lecturers to mark work and give individuals personal feedback.

Security:
- Protection of the content of the MOOC from intruders who might hack the courses in order to jeopardize the name of prestigious universities or professors.

(b)   Describe the relationship of **one** primary stakeholder to the IT system in the article.

Describe means to include who, what and where but not how and why for full marks.

[1]: Who – identification of the stakeholder.

[2]: Where – the use of personal learning devices to access the online course/MOOC/VLE
What are they doing with the IT system – Registering and participating in an online course (learner), delivering an online course (lecturer), offering an online course and supporting the IT framework (MOOC administrator/university), using course results (potential employers).

Primary stakeholders may include the following:
- learners – register and participate in the online courses/MOOCs
- lecturers, professors, course mentors – upload lectures, learning resources, download assignments to mark from the online course/MOOC
- MOOC administrators – set up, provide the platform and course framework and access permissions for the professors and learners on the online course/MOOC
- universities provide the online course/MOOC
- employers – may look at the participation of potential employees and how they have participated on a MOOC.

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]

2. (a) Describe, step-by-step, how the IT system works.
IT system: Virtual learning environment (VLE) for learners to participate in online courses.

Many of the responses will not fit neatly into a mark descriptor, so best fit will need to be applied.

[1]: the student may show some understanding of the process but not in a step-by-step approach – using the information in the article and possibly some steps missing.

[2]: the student is able to provide a logical step-by-step account using the information in the article but lacks some details (three major steps are required from the five listed below). Best fit if the answer contains developments/information beyond the article but not in a step-by-step approach.

[3]: the student is able to provide a step-by-step account which may be detailed (There is further detail in some of the five major steps eg detail of inputs/outputs used, connectivity, processing when interacting with the online course) which includes some information beyond the article (at least two developments). Expect at least three major steps plus developments.

[4]: at least four technical developments and four major steps in detail. Not all five steps are needed; explicit storage is often omitted as implied in the description of the processing.

Answers provided in the article include the following:

- learner may enroll on any course
- consist of a range of online content on plain HTML pages
- pages may be interactive
- synchronous courses – features include: interactive whiteboards, live chats and webinars
- asynchronous courses – features include: recorded video lectures, collaborative learning, blogs, online discussions.

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

Setting up:
- registering with the online course to create an account including the username and password with some personal information *eg* date of birth, gender
- logging into the account using the web browser or an app
- cookies are enabled
- use of drop down menus to select course choices
- courses may need specific web browser plug-ins to be able to view the course properly.

Connectivity:
- broadband internet connectivity / WiFi in public places / mobile broadband required to connect and interact with the course
- data is encrypted during transmission/decrypted at server.

Course participation:
- courses consist of modules/units
- videos may be downloaded or streamed
- course web pages may be programmed with JavaScript/HTML 5 to allow for course interaction
- course webpages have hyperlinks and navigation bars, search bars, use of tags and metatags to help learners navigate through the course
- examples of collaboration *eg* course integration with Google Docs, One Drive
- additional course features – checklists, course completion bars, badges, self-printing certificates
- flipped classroom – students are given material to prepare before taking part in an online classroom session
- assessment of courses, through online quizzes, uploading of assignments, downloading assignments with professor-written feedback
- feedback in the form of video chat, voice messages
- other communications in the form of email, forums.

Storage:
- the MOOC Server / database stores all course information, learner profiles
- learners may locally store assignments and downloaded content so they can work offline.

Output:
- on-screen display of the course and its learning resources
- digital badges for completion of courses
- print out of course certificates.

Course Development:
- Course material developed in many formats (text, image, audio, video)
- Upload on VLE
- Streams suitable quality depending on connection speed

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

Explaining the link between the concern and specific parts, or whole, of the IT system means the student must include how and why the concern has arisen from the use of the IT system. The naming of the concern identified in Criterion A may be implicit.

Q2(b) clearly asks for a link to Q1(a), but the link only needs to be generic – eg for a specific security concern described in Q 1(a), then in Q2(b) the student can explain a security weakness without reference to the specific concern in Q1(a).

If the concern addressed in Q2(a) is completely different from that in Q1(a) a link cannot be made and hence [0].

Q2(b) can also be related back to Q1(b) where the who and what and where of the IT system usage are described.

[1]: If the student identifies the relationship between the concern and the IT system. This may be a repeat, or rewording, of the response to (1)(a) or lack detail for the how and why.

[2]: how and why the concern can happen must be described: eg privacy: responses need to specify how (technical) the data can be accessed (similar to some of the steps for 2(a)) and why it has been allowed to be accessed (eg lack of privacy settings – technical weakness).

Answers may include the following:

Reliability:
- reliability of internet connection – if there is limited connectivity, learners will not be able to access the course or may experience problems when uploading, downloading assignments (how); learners may be in rural areas or low signal areas; no lease line connection means learners are sharing bandwidth (why)
- inadequate uploading bandwidth – universities may not have subscribed to adequate bandwidth to accommodate the large scale number of users accessing the course at any one time and so access to the course may be slow or denied (how); poor planning of number of users at the same time, lack of money to invest (why)
- MOOC web servers may be down for maintenance (how); administrators may not have invested in adequate back up servers; administrators choose to conduct maintenance in high peak times.

Authenticity:
- learners who complete courses and gain certification may not be the same as that registered (how); inadequate verification at registration *eg* no submitting of birth certificate; inadequate verification during participation (why).

Privacy:
- use of data collected – personal information at registration and participation data – may be used for purposes unknown or without permission, *eg* unwanted learning advice or targeted advertising; information may be passed on to potential employers (how); lack of policies on the use of personal data (why).

Surveillance:
- being tracked while participating in the course – course managers will be able to track learner behaviour *eg* time of day, frequency of contributions to discussions *etc* (how); each activity logged with the time, IP address and this information is made easily available to course managers as they have control panels and admin rights (why).

Lack of policies:
- lack of policies and guidelines could lead to different quality of online courses depending on the professors and mentors working on the course (how); lack of experience of universities with online courses; professors ignoring the guidelines; lack of monitoring of the policies (why).

Inequality of access / Digital Citizenship:
- learners in rural areas may experience slower access to the course; may skip videos or other resources (how); mobile/internet broadband providers may not have invested in adequate infrastructure in rural areas (why)
- learners with disabilities *eg* hearing or sight impairment may not be able to access the resources of the course (how); poor course design *eg* hard for screen readers; no subtitles for videos (why)
- cannot speak English so cannot access (how); the materials and website have not been translated (why)
- student does not have the necessary skills to operate a computer as may not have access to one or not educated to used one (how); lack of investment in technology in poorer or rural areas on the part of government; lack of economic resources in the country or area (why).

People and machines:
- certification on a course is not always recognized by employers (how) – the university may not be widely known; lack of accreditation of the course; lack of learner verification at registration (why)
- high non-completion rates of learners – learners not completing all of the activities *eg* not participating in discussions, uploading assignments or finishing each unit of the course (how); lack of feedback, lack of monitoring, poor course design (why).

Candidates are expected to make reference to the 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]**

3.   Evaluate the impact of the social/ethical issues on the relevant stakeholders.

Impact = result/consequence/effect/outcome on stakeholder

There are a number of impacts that can be compared and critically analysed.
Given the time constraints not all are needed. At least two stakeholders are required
for entrance into the top markband.

Marks	Level descriptor
1	one or two impacts identified.
2	more than two impacts described of either type – positive or negative.
3	analysis by structure – division into groups *eg* positive/negatives and/or various stakeholders.
4–5	must include linking analytical connections (between positive/negatives, various stakeholders, various issues) and/or added evaluative comments about the implications for stakeholders. Students who have supplied a good conclusion apply best fit here. Only one stakeholder, maximum of *[4]* if includes analysis and evaluations, *eg* the impacts on the learner only.
6	recommend at least two negative and two positive impacts for each stakeholder in order to provide a balanced analysis in the top markband. Quality of analysis is the most important consideration.
7–8	a conclusion backed by direct reference to the impacts described is needed. The evaluation should focus on the overall impact on all the stakeholders mentioned discussing the balance between the positive and negative impacts.

Answers may include the following:

Positive impacts to the learner may include the following:
- greater access to university courses overseas or in other states as you can study from home
- parents, learners with physical disabilities can learn from home
- students who have been previously denied access to courses as they did not have the entry grades still can access a qualification
- learners can learn at their own pace, in their own time ensuring that they understand each topic before moving on
- learners have access to expertise of professors from reputable universities
- learners can gain knowledge for personal use or to further their careers
- tracking of learners can mean the course mentors can offer more guidance
- the courses can be designed to meet the learning needs of a wide range of learners
- large number of participants, could lead to more collaboration which helps learners and their understanding of the topic
- asynchronous courses mean that learners can look after their families or work while studying as this can be done at a time that suites them
- most courses are free so students are not excluded due to the cost
- there may be opportunities to collaborate with other students from different countries allowing a global perspective.

Negative impacts to the learner may include the following:
- reliability – students may experience frustrations and limitations to accessing course materials if they have inadequate access to the internet or if the site is down for maintenance. This could lead to students skipping modules and not fully understanding the topic
- the learner may not have a suitable personal device to access the course properly *eg* web browser lacks plug-ins or is not compatible *eg* Flash on Chrome
- the learner may not have the technical ability to update their personal devices when the online course does not load properly or they have been denied access
- courses may not be designed well *eg* bugs so pages don't load properly, or missing files, corrupted files – which may prevent learners from accessing the materials and understanding the topic
- lack of available technical support (time zones), may make it difficult for learners to report problems with the courses
- privacy – online learners' personal data collected at registration may be used for purposes unknown or without permission, *eg* for advertising purposes
- privacy – online MOOC activity details may be passed on to employers without the students' knowledge
- surveillance – being tracked while participating on the course
- lack of policies and guidelines could lead to poor quality of some online courses
- learners may not understand the course as they do not have adequate preliminary knowledge of a topic and do not understand the lectures by the professors and so give up
- lack of professor/course manager support which is replaced with online quizzes, may mean students make the same mistakes over and over
- some courses have few feedback features built into their design, leading to learners feeling alone and unsupported which is demotivating and can cause non completion; other courses have the collaborative tools, but students are intimidated by the large number of participants
- inequality of access. Learners with disabilities *eg* hearing or sight impairment may not be able to access the resources of the course due to poor course design *eg* hard for screen readers; no subtitles for videos
- certification on a course is not always recognized by employers
- high non-completion rates of learners may cause them to feel a failure
- some students do not work well when setting their own deadlines
- courses may not be as good a quality as those provided by traditional higher education institutes
- inappropriate behaviour such as cyberbullying in online discussions with lecturers and other students
- students need to be self-motivated. Learning is more impersonal and without face-to-face contact with a lecturer it is easier for them to drop out
- health risks associated with longer use of computers.

Positive impacts to the professor/lecturer may include the following:
- have the opportunities to collaborate with other professors on the course
- provides more opportunities to share their expertise and knowledge to a wider audience
- may receive pay increases from the universities for their work
- may guarantee more work for professors due to the increase in demand of learners
- can accommodate learners with needs *eg* subtitles in different languages
- no pressure for learners to obtain certain targets or grades as they are all voluntary
- all learners have chosen to register and so are keen to learn (no disruptive students).

Negative impacts to the professor/lecturer may include the following:
- reliability of internet connection – professors may have to invest in higher bandwidth at home to download and mark assignments
- registered learners are not face-to-face so it may be hard to motivate students to stay on the course
- having learners on different parts of the course at different times makes it harder for professors
- due to the lack of course prerequisites professors may feel frustrated at the lack of understanding of some learners
- professors may feel frustrated with bugs in the course design and not have the IT support needed at home
- surveillance – professors may be tracked while participating on the course – this makes them feel uncomfortable
- lack of policies – professors may not receive adequate guidelines and policies related to course content
- professors may not have the technical knowledge or equipment to upload videos of the right format – this could lead to more time being spent on producing course resources
- high non-completion rates of learners may be demotivating for professors
- one professor may be assigned to a course to look after one thousand registered learners
- professors may not receive adequate compensation for the increased workload of online courses
- more time taken to monitor and support MOOCs could mean that less time is available for writing of e-books, providing paid tuition or working on their research papers
- professors may feel more stressed due to the 24/7 nature of worldwide available online courses.

Positive impacts to the MOOC universities may include the following:
- increased reputation due to wider access of courses around the world
- more learners may register for paid courses (MOOCs or traditional) if they find the free MOOCs good
- administrators may be able to fund the free courses by providing related advertisements on each course
- social conscience of the MOOC universities can be satisfied as are providing education for all
- issues arising from Intellectual Property, the content may not be professor's own work and putting it online may lead to law suits on university/developer etc.

Negative impacts to the MOOC universities may include the following:
- reliability – universities may not have subscribed to adequate bandwidth for students to access the MOOC server – this could lead to high noncompletion rates, poor reputation and increased complaints
- providing web server space and bandwidth for learner/professor access is expensive to provide and maintain. Nature of 24/7 would mean that higher specification backup servers and generators would need to be provided
- increase in IT support staff would be required *eg* to maintain the servers, answer help desk queries
- authenticity – learners may be being awarded certificates without personally having completed the assignments. This could lead to low recognition of course completion by other universities or employers
- privacy – use of data collected for purposes unknown or without permission could lead to court cases should learners discover that their information had been shared
- administrators will need to seek legal advice in developing policies which can be costly in writing and implementing
- professors and lecturers may need further training in order to use the MOOCs
- professors and lecturers may ignore policies and guidelines – more systems, manpower will be needed to monitor and correct this
- to develop courses that meet accessibility requirements may be more costly and will need experts to develop
- certification on a course is not always recognized by employers – this could lead to poor registration rates on certain courses.

Positive impacts to the traditional university may include the following:
- they may attract experienced professors or lecturers who dislike technology
- fewer support staff, hardware/internet costs
- less dependence on technology.

Negative impacts to the traditional university may include the following:
- they may not be able to compete with the universities offering MOOCs and lose reputation or ranking
- may appear old fashioned and discourage learners to join their courses.

Positive impacts to employers may include the following:
- behaviour on MOOCs can act as indicators of an employee's motivation and suitability for a job
- employers can use MOOCS to provide free professional development opportunities for their staff.

Negative impacts to employers may include the following:
- harder to make decisions at recruitment as employers are not all sure of how to rate/value online courses
- employees may not have earned the MOOC certificate – it could be fake or a friend had completed the course. Employers may be tricked into employing staff who do not have adequate training
- legal action may be taken against employers for inappropriate access to employees' personal information on MOOCs.

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 is 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]

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

    [1]: solution is identified.

    [2]: solution is described (what, who, where) and the link to article may be implicit, which could be a general description eg general policy description similar to that found in a textbook.

    [3]: the solution is applied to the problem directly and not generally – how and why it solves the problem (first positive evaluation). The solution must be feasible and can be applied to the problem, even if not good "quality".

    [4–5]: at least one more positive evaluation and at least one negative evaluation is required. Best fit if description is limited.

    [6]: fully evaluated strengths and weaknesses requires a balance of at least two positive and negative evaluations.

    [7–8]: concluding paragraph directly referencing the evaluations. Students may propose future developments as part of the conclusion instead of discussion of evaluations – best fit applies.

    Best fit also applies if a student has not fully described the solution or provided the minimum four evaluation best fit applies.

    Answers may include but are not limited to the solutions listed below. The examiner must use his/her judgment and knowledge to determine if a solution applies to the problem and is feasible.

    Answers may include the following:

    Reliability of internet connection:
    * universities can offer out-of-hours internet facilities for professors
    * learners can study in public WiFi hot spots
    * universities can develop different options of courses depending on bandwidth availability
    * inadequate bandwidth purchased – universities need to analyse their internet usage and subscribe to higher bandwidth
    * university can seek sponsorship through advertising/develop partnerships with internet providers to improve provision
    * MOOC web servers may be down for maintenance – purchasing of backup servers with fail-over provision; Analysis of online activity can determine low peak times for maintenance
    * Governments can encourage the development of Internet Infrastructure / Provide public high speed wifi hotspots.

Authenticity:
- in addition to online registration, learners have to submit forms of identity
- signing of contracts by learners on code of conduct
- use of video chat to authenticate participation
- algorithms developed to look for consistency in styles of writing within a student's different assignments
- checking of plagiarism of submitted assignments.

Privacy:
- development of privacy policies on the use of data collected which are clearly stated at registration that learners have to sign.

Surveillance:
- clear policies about the surveillance being carried out by course managers who may be monitoring the professors or the learners.

Lack of policies (on course standards):
- different quality of online courses – employ external moderator of courses to assess course quality
- create a framework of standards which course developers need to use to self-assess the online courses
- ask for learner feedback about course design and quality at the end of the course
- recruit professors with experience in online courses or send professors on training
- low completion rates, could be due to limited feedback or help – develop courses to include more professor or online support.

Inequality of access / Digital citizenship:
- poor course design – create a set of standards that all course developers need to follow regarding accessibility
- employ experts to improve design for screen readers; developing of subtitles for videos
- develop more course features to accommodate the different needs of the learners.

People and machines:
- certification on a course is not always recognized by employers (how) – develop partnerships with employers or other universities and establish additional steps in order to gain credit
- better education of employers to understand what MOOCs are and what is required to complete one
- high non-completion rates of learners –
  - develop course design for more feedback for learners
  - provide more online IT support
  - provide more incentives to complete the course *eg* pay for courses but get refund once passed.

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

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 references to the information in the article are made appropriately throughout the response. There is use of appropriate ITGS terminology.