



General Certificate of Education
Advanced Subsidiary Examination
June 2011

COMPUTING

COMP1/TN

Unit 1 Problem Solving, Programming, Data Representation and Practical Exercise

Teachers' Notes

To be given immediately to the teacher responsible for GCE Computing

Open on receipt

This booklet contains important information for centres about preparing for COMP1, an on-screen examination to be held on 27 May 2011, in advance of the examination. The purpose of this booklet is to:

- give instruction in the preparation of the centre's network to be used in the examination
- provide support and guidance for centres in their management of the examination for COMP1.

In the electronic version of this document, there are links to the Joint Council for Qualifications (JCQ) website, and the AQA Programmers referred to in Section 4.

This document should be read in conjunction with the JCQ document, [Instructions for Conducting Examinations \(ICE\) 2010-11](#), which is available on the JCQ website.

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1 The responsibilities of the Head of Centre

It is the responsibility of the Head of the Centre to ensure:

- that appropriate security systems are in place to prevent unauthorised access to examination materials, including candidates' work
- that AQA's requirements for the availability of the *Preliminary Material* files to candidates for the examination are met in advance of the examination
- proper conduct of the examination in accordance with these *Teachers' Notes* and the JCQ [Instructions for Conducting Examinations \(ICE\)](#)
- a sufficient provision of resources and appropriate system security, as detailed in this document
- that candidates are made aware of the requirements of the examination.

2 Security

The centre must be able to demonstrate to a JCQ Inspector, should he/she visit, that appropriate security systems are in place to prevent unauthorised access to the examination materials. These systems must ensure that:

- electronic examination materials are stored securely at all times including before, during and after the examination. All wireless capabilities must be disabled or otherwise made secure e.g. by encryption
- candidate examination password information is stored securely and given to candidates only at the start of the session for the examination. Only examination administrators and the candidate can have access to the candidate's password which gives the candidate access to the on-screen examination
- expertise to access, administer and support the examination is available.

3 Materials which a centre can expect to receive via e-AQA

With the exception of the question paper, all materials for the examination will be issued only in the Secure Key Materials folder via e-AQA. The question paper will be sent in hard copy to your Examinations Officer. It must be opened only on the day of the examination in front of candidates.

On 1 March: The following material will be published on e-AQA:

- the *Teachers' Notes* (COMP1/TN) in PDF format
- the Electronic Answer Document (EAD) in which candidates will type their answers to the question paper during the examination. **This will be provided as a Microsoft® Word (2003) document** (See Appendix 1, Section B of these *Teachers' Notes* if your centre's software is not compatible with this format.)

Turn over ►

- *Advice on using the COMP 1 Electronic Answer Document* in PDF format. (This is replicated in Appendix 1 of these *Teachers' Notes* so that centres may issue copies to their candidates.)
- the Preliminary Material (COMP1/PM) in PDF format. This is generic to all programming languages.
- the Skeleton Program (available as a text file) in the following programming languages.

PHP
C#
C
Java
Pascal/Delphi
Python 2.6
Python 3.1
Visual Basic 6
VB.NET

With the exception of the *Teachers' Notes*, Teachers are free to teach to and issue the above materials to their candidates as soon as it appears on e-AQA. However, as in previous examinations, before issuing the Skeleton Program of their choice to candidates, teachers may find it necessary to make minor alterations to it in order to adjust it to the environment (package) that has been adopted at their centre. Instructions as to how this must be done are given in Section 4 of these *Teachers' Notes*.

4 The Preliminary Material, the Skeleton Program and the Electronic Answer Document

The Preliminary Material

- 4.1 Before the examination, centres must make **two** hard copies of the *Preliminary Material* for each candidate. Print the *Preliminary Material* 'back to back' and pin together using two staples down the spine of the document.

The first hard copy of the *Preliminary Material* is for immediate use by candidates.

Candidates must not take this first hard copy of the *Preliminary Material* into the examination room. Centres must ensure that candidates are aware, in advance of the examination, of this requirement. If candidates have any unauthorised material in an examination (whether or not they intended to use it) it may be considered as malpractice.

The second hard copy of the *Preliminary Material* is for use by the candidate in the examination. This second hard copy must be retained by the centre and issued only in the examination room.

The Skeleton Program

- 4.2 Your centre is at liberty to make **minor amendments** to the Skeleton Program code in order that it will successfully run within your chosen programming environment – which

does not need to be the same as the programming environment used by AQA in the development of the Skeleton Program. **If you do make any amendments you must contact an AQA Programmer (see Appendix 2) on or after 1 March and in good time before the examination on 27 May. Also if any automatic conversion process results in changes to the Skeleton Program then this too must be checked with the Programmer.** It is anticipated that the code amendments will, typically, only relate to the provision of programming libraries for basic input and output. The e-mail addresses given in Appendix 2 will only be accessed by AQA Programmers from 1 March to **the day before the examination**.

- 4.3 After agreeing any changes with the AQA Programmer (if changes are required) centres must:
- upload the (amended) Skeleton Program(s) (hereafter to be called ‘the Skeleton Program’) to the secure area of your centre’s computer network in good time before the examination. Candidates must only have access to this Skeleton Program when they are sitting the examination. See Section 8 of these *Teachers’ Notes* for more information
 - set aside one hard copy of the Skeleton Program to be put on top of your candidates’ completed Electronic Answer Documents when being sent to the **examiner** allocated to your centre. Your Examinations Officer will have the name of your centre’s examiner.
- 4.4 Before the examination, centres may load a copy of the electronic version of the Skeleton Program onto a **separate** area of their centre’s network to allow candidates to ‘experiment’ with the program. Candidates must **not** have access to this version on the day of the examination.

The Electronic Answer Document (EAD)

- 4.5 On or after 1 March, the EAD can be issued to candidates so that they can enter their personal details on the front cover and in the footer (see Appendix 1, *Advice on using the COMP 1 Electronic Answer Document*). A copy of this personalised EAD can then be stored by the centre in each candidate’s own secure space on the centre’s network. If candidates are to complete the EAD in this way, the centre is responsible for ensuring that no other information is typed into the EAD in advance of the examination.

Centres are encouraged also to issue another copy of the EAD to candidates at any time before the examination so that candidates may practice using it. In particular, candidates should practise how to re-size a screen capture (screen dump/shot) to ensure that they can be read with ease by the examiner.

5 Timetabling

- 5.1 Centres must arrange for **each** candidate to be allowed to complete the examination in two hours.
- 5.2 Centres which are unable to accommodate all their candidates in the timetabled session of the examination will need to ensure that candidates awaiting examination are supervised under examination conditions from the published starting time of the examination until their test is completed.

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- 5.3 Candidates awaiting their examination must not have access to any means of communication including mobile telephones, the Internet or computers. Anyone wishing to leave the supervised area must be escorted by a member of staff.
- 5.4 There will be one attendance register for the examination. This must be fully completed at the end of the final session (if more than one).
- 5.5 An accurate seating plan of candidates present at each session must be kept.
- 5.6 Candidates may sit the examination once only in any examination series.

6 Accommodation

- 6.1 Centres must ensure that:
- the accommodation is suitable for an examination room in accordance with [JCQ ICE](#) Section 5
 - a sufficient number of workstations is available, including at least one replacement computer and printer, and a supply of easily replaced items (e.g. mouse).
- 6.2 A computer must be made available to each candidate on a 1:1 basis. In advance of the examination, each workstation **must** be tested to ensure full working order for the purpose of the examination.
- 6.3 Whilst the layout of the room cannot be specifically prescribed, centres should ensure that:
- each workstation in use by candidates is isolated by a minimum space of 1.25 metres measured from the nearest outside edge of one screen to the next, unless monitors are positioned back to back or separated by dividers or privacy screens. Where it is not possible to arrange the workstations with this space, it is recommended that only every second workstation is used
 - the arrangement of workstations for on-screen tests and the position of the invigilator's desk should facilitate detection of any unauthorised activity by candidates, for example communication with others or use of unauthorised reference material.
- 6.4 Candidates must be given sufficient workspace to allow them unrestricted access to the computer and to carry out non-computer activities such as checking and collating print-outs, and the use of additional permitted materials i.e. their question paper and their *Preliminary Material*.
- 6.5 The room should have sufficient lighting, heating and ventilation. The computer screens should be placed to avoid excessive reflection.
- 6.6 The following JCQ notices must be displayed in the examination room according to Section 5 of the [ICE](#):
- Information for candidates – for on-screen tests (A3 version) (Appendix 7 of [ICE](#))
 - Mobile Phone poster (Appendix 8 of [ICE](#)).

- 6.7 The centre number, session, start and finish times should be displayed prominently. A clock should also be visible to all candidates.
- 6.8 All display material must either be completely covered up or removed from the examination room.
- 6.9 A copy of the [JCQ ICE](#) document should be available to the invigilator in the examination room.

7 Candidates who are taught at a centre other than that which entered them for the examination

COMP1 is not centre-assessed coursework so consortium arrangements as defined by the JCQ do **not** apply. If a candidate is to sit the COMP1 examination at a centre other than the one by which he/she was entered for the examination (the 'home' centre), the home centre of the candidate must complete the JCQ form called an [Alternative Site Form](#) which tells the JCQ Inspectorate that the candidate will not be sitting at the centre which entered them for the examination. This form is available on the JCQ Website: www.jcq.org.uk.

8 Preparation of your centre's computer network

- 8.1 Centres must set up on their network a separate user area for each candidate sitting the examination. Each candidate must be assigned an individual candidate user name and password which is not the one they have used throughout the academic year. These user areas must not be accessible to candidates at any time other than during the examination session. (Candidates must be advised at the start of the examination of the need to save regularly in a user-created directory structure that protects against accidental overwriting that would result in the loss of work.)
- 8.2 Each candidate's access to their user area must be blocked at the end of the COMP1 examination session. If any candidates are sitting the examination at a later session, centres must ensure that the user areas of those who have already sat the examination cannot be accessed. Different passwords must be used for each candidate.

See Section 14 of these *Teachers' Notes* for centres unable to provide a separate candidate user area on the centre network.

- 8.3 Each user area should only have a copy of the files associated with the scheduled examination, and candidates should only have access to the software packages appropriate to the examination. Centres must ensure that the software available to candidates will allow them to meet the requirements of the examination. The software required is:
 - the appropriate programming language development system which your candidates are going to use in the examination
 - a word processor
 - image editing software or screen capture software where this is not already provided by the computer's operating system.
- 8.4 Centres must not store their working files in a shared area. There should be an individual copy of:
 - the required *Preliminary Material* file

- the EAD file
- the Data file, if appropriate to this year's examination

in each user area before the examination begins.

- 8.5 Each user area must be allocated sufficient electronic storage space to allow candidates to save their EAD.
- 8.6 Candidates must not be able to save anything during the examination in a central location where anyone can access such material.
- 8.7 Centres should ensure that up-to-date virus protection measures are in place.
- 8.8 Candidates must **not** have access to:
- any documents/files
 - data stored in shared areas on a network
 - data stored on the hard drive or portable storage media (unless the latter is part of an emergency measure brought about by circumstances described in Section 14 of these *Teachers' Notes*) other than those required for the examination
 - a calculator of any sort, including that on the computer
 - e-mail, an intranet, the Internet or instant messaging software.
- 8.9 **No extra time can be allowed for slow machines or networks which run slowly.** Centres must ensure the appropriate hardware and software is available to candidates and there are no problems with the computer facilities **before** the examination.
- 8.10 Well in advance of the examination, centres must ensure that candidates know:
- where they are to save the work they do during the examination
 - what file format to use
 - the name format in which to save their work
 - about the role of the print monitor (see Section 11, below).

9 Immediately before candidates start the examination

- 9.1 The Invigilator must deliver an announcement in accordance with Appendix 2 of the JCQ [ICE](#) document, *A suggested wording for the invigilator's announcement at the beginning of an examination*.
- 9.2 After issuing the question paper and a new hard copy of the *Preliminary Material* to each candidate and immediately before the start of the examination, candidates must be instructed to:
- load the programming language software
 - load the word processing software
 - load the appropriate Skeleton Program file
 - load the Electronic Answer Document.

On the front page of the Electronic Answer Document (if this has not been done in advance of the examination), candidates must insert their:

- Centre Number
- Candidate Number

- Candidate Name
- Programming Language.

Into the footer **on every page**, other than the front page, candidates must insert their:

- Centre Number
- Candidate Name
- Candidate Number.

They must then **save the Electronic Answer Document** with their Candidate Number as the filename.

- Candidates must also be reminded of the need to **save regularly** their word processed copy of the Electronic Answer Document and the files developed within the programming software in the user-created directory structure that protects against accidental overwriting that would result in loss of work.

The above instructions are vital in order to ensure that at the end of the examination the source of each print-out is clear and that a candidate's file can be identified should there be a need for re-printing (see Section 12.4). It may not be possible to credit the whole or part of a candidate's answer if these details are not printed on every page as instructed above.

10 Conduct of the examination

- 10.1 There must be one invigilator for every 20 candidates or fewer. Additional invigilators can be employed at the discretion of the centre to ensure all candidates are in view at all times.
- 10.2 Technical help should be available throughout the examination in case of hardware/software problems and to assist with the invigilation of the test.
- 10.3 A GCE Computing teacher may perform the role of:
 - an invigilator (provided they are not the sole invigilator in the examination room)
 - or the source of 'technical help' (in Section 10.2, above) if and when required.
- 10.4 Candidates may bring a pencil/pen and ruler with them into the examination. On request, candidates may be provided with pen and paper to do rough workings. These rough workings must be handed to the invigilator at the end and not removed from the examination room by the candidate.
- 10.5 Other than the question paper, candidates must not have access to any books or documents whilst sitting the examination. Candidates should only use or have access to permitted software i.e. that referred to in Section 8.3 above.
- 10.6 The examination must be taken under examination conditions and communication between candidates is not permitted at any time, including communication via computers.
- 10.7 Candidates must not bring portable storage media (e.g. memory sticks, CDs etc) into the examination, although immediately before the start of the examination (as in Section 14.4), some form of portable storage medium may be used by the centre for the provision of the required software to the candidate.
- 10.8 Candidates must **not** have access to pre-prepared templates or other files during the examination except:

- the EAD
- the *Preliminary Material*
- the *Skeleton Program* and any associated files
- the software referenced in Section 8.3.

Software-specific wizards may be used.

- 10.9 Candidates may use paper-based dictionaries (English or bilingual only) during the examination. Technical dictionaries are **not** permitted.
- 10.10 Candidates must **not** use a calculator of any sort.
- 10.11 Candidates may use software-specific help facilities. It is expected that the programming language software will include the normal help files as supplied with the original software.
- 10.12 If a candidate experiences technical difficulties, including printing, the centre may use its discretion to produce print-outs already sent to the printers outside the timed 2-hour examination, and must write a note about the difficulty on the candidate's output.
- 10.13 **No extra time can be allowed for slow machines or networks which run slowly.**
- 10.14 Candidates are not allowed to remove anything from the examination room. The invigilator must collect all extraneous candidate materials (for example, draft copies of candidates' work, rough work, additional print-outs and question papers) at the end of the examination (or each examination session, if more than one) and keep these in a secure place until the publication of results by AQA.

11 Printing

- 11.1 It is recommended that the ratio of candidates to printers is no more than 10:1.
- 11.2 Centres must ensure that the printers are set up to print on A4 paper. EADs must be printed on one side of paper only.
- 11.3 There is no requirement to print in colour. No extra credit is given for work printed in colour.
- 11.4 Printers must be in the same room as the candidates. A Print Monitor (who should neither be an invigilator nor a candidate, but who could also be the source of technical help) must be assigned to collect and deliver print-outs to the candidates. Candidates must **not** be allowed to collect print-outs.
- 11.5 It is the responsibility of the Print Monitor to ensure the correct ownership of each print-out.
- 11.6 Candidates must send their print-outs to the printer during the timed 2 hour examination. If a candidate experiences difficulties when trying to print, the centre may use its discretion to produce print-outs already sent to the printers outside the timed 2 hour examination, and must write a note about the difficulty on the candidate's output.
- 11.7 Do not be concerned if the AQA logo does not appear when the EAD is printed out.

12 At the end of the examination

12.1 Before papers are collected by the invigilator, **candidates are required to:**

- collate their print-outs into question number order
- attach them securely together in the top left-hand corner using a staple or tie.

The means of securing the print-outs together must be provided by the centre.

12.2 Candidates must ensure that their name, centre number and candidate number are on each page of each print-out. It is the candidate's responsibility to ensure that these details are correct on each page. Handwritten details are acceptable.

12.3 **When sending candidates' completed EADs to the AQA Examiner, one copy of the Skeleton Program – as made available to candidates for the examination – must be placed on top of the completed EADs.**

12.4 Centres must remind candidates to ensure that their EAD is individually saved on the network and in their individual work areas. Centres must ensure that these EADs are secure from unauthorised access. Centres must safeguard this work and store it in a manner which will allow an individual's saved work to be easily retrieved if it is required for reprinting. After the examination the EADs of all candidates must be copied on to a portable storage medium and kept securely by the Examinations Officer at least until the publication of results.

12.5 All other examination material (for example, draft copies of candidates' work, rough work, additional print-outs and question papers) must be collected by the invigilator at the end of each session and stored in a secure place until the publication of results by AQA.

12.6 Immediately after the end of the examination session, each candidate's access to their user area must be blocked. If any candidates are sitting the examination at a later session, centres must ensure that the user areas of those who have already sat the examination cannot be accessed. Different passwords must be used for each candidate.

13 Malpractice

This type of examination relies on the integrity of candidates, teachers and invigilators. If any candidates submit work which is not their own, or any form of malpractice occurs, or is thought to have occurred, it must be reported to AQA. The matter will be investigated by AQA and if it is found that the candidate has been involved in malpractice, the candidate may be disqualified from at least the subject concerned.

14 Emergencies

14.1 In the event of an emergency e.g. a fire alarm sounding, the invigilator should take the following action:

- evacuate the examination room
- safeguard the security of assessment content and responses (for example by locking an assessment room which has been evacuated without closing down software)
- ensure candidates are supervised as closely as possible whilst out of the examination room to ensure there is no discussion about the examination

- after the candidates' return, note the point and time at which the interruption occurred and the duration
- allow the candidates the full working time prescribed for the examination
- make a full report of the incident, and of the action taken, and submit it to AQA.

- 14.2 In the event of hardware, software and communication failures affecting individual workstations or the network, the centre must ensure candidates continue the assessment session at a different workstation or at a later time, without the loss of working time.
- 14.3 In the event of a total technology failure where candidates are unable to sit the examination (or restart the examination at a later time), the Head of Centre must write to AQA Candidate Services department at their administering AQA Office with full details.
- 14.4 Centres unable to provide a separate candidate user area on the centre network can instead provide each candidate with a named/labelled USB pen drive or similar storage medium. Each storage medium must be preloaded with the *Preliminary Material* and the EAD. At the end of the examination the storage medium must be collected in, the contents burnt to disk for backup and stored at least until the publication of results.
- 14.5 If a candidate experiences technical difficulties, including printing, the centre may use its discretion to produce print-outs already sent to the printers outside the timed 2-hour examination, and must write a note about the difficulty on the candidate's output.

GCE Computing

June 2011 examination

COMP1: Problem Solving, Programming, Data Representation and Practical Exercise

Advice on using the COMP1 Electronic Answer Document¹ (EAD)

Centres may give a copy of this Advice document to candidates at any time, including during the examination.

The Electronic Answer Document is provided by AQA to centres as a Microsoft® Word (2003) document. Candidates must type their answers to the COMP1 question paper into the EAD on-screen.

A In advance of the examination

- Candidates' details on the front cover and in the footer of page 2 (and therefore any subsequent pages they may use) may be completed in advance of the examination and saved to the individual candidate's user area of the secure network. If candidates are to complete the EAD in this way, the centre is responsible for ensuring that no other information is typed into the EAD in advance of the examination.
- Centres must ensure that candidates know:
 - where they are to save the work they do during the examination
 - what file format to use
 - the name format in which to save their work
 - about the role of the Print Monitor
 - how to re-size a screen capture (screen dump/screenshot) to ensure the examiner can read it with ease.

The COMP1 examination is not a test of candidates' typing or word processing skills, but centres are strongly encouraged to ensure that their candidates are familiar with the EAD before the examination. Candidates are free to practice using a *copy* of it before the examination.

B What to do if the EAD fails for any reason

- When printing the Electronic Answer Document, if it appears to have page breaks in inappropriate places, check whether the margin size on the default printer needs reducing. The margins used for the original Electronic Answer Document are: Top - 2 cm; Bottom - 2.5 cm; Left 2 cm; Right - 2 cm.
- Do not be concerned if the AQA logo does not appear or is mis-shapen when the EAD is printed out.

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Appendix 1 comprises 'Advice on using the COMP1 Electronic Answer Document'.

If your centre's word processing software is not compatible with Microsoft® Word (2003), centres should ask candidates to type their answers into a blank document ensuring that the **front page prominently** carries the following information:

- GCE Computing, COMP1 examination, Summer + year of examination
- Centre Number
- Candidate Name
- Candidate Number
- at the end of the examination, the candidate's signature.

Each subsequent page must also carry the following personal information of the candidate in a footer (either typed in or written by hand):

- Centre Number
- Candidate Name
- Candidate Number.

Each answer **must** be clearly numbered. All pages must be securely attached together with a staple or tie in the top left hand corner.

C Using screen captures (screen dumps/shot) in the EAD

- Paste the screen capture into a cell of the EAD.
- If only part of the capture shows up in the cell:
 1. select the cell in which the screen capture appears
 2. double click to bring up the picture editor dialogue box called 'Format Picture'
 3. select the 'Layout' tab
 4. select the 'In Front of Text option'
 5. press 'OK' and go back to your EAD cell
 6. expand the cell in the EAD by pressing the Enter key on your keyboard enough times until the cell is big enough to show the whole screen capture. Crop the screen capture if necessary.
- If the above should fail, candidates should be advised to:
 1. paste any screen capture into a blank Word document and save it using a suitable filename
 2. print this document with a footer containing the Centre Number, Candidate Name and Candidate Number (or write them on by hand after printing)
 3. insert the question part number
 4. attach to the printed EAD in the relevant place leaving a reference in the corresponding cell of the EAD to advise the examiner to look for a supplementary handout containing a screen capture.

GCE Computing**June 2011 examination****COMP1: Problem Solving, Programming, Data Representation and Practical Exercise**

What centres must do to amend AQA's Skeleton Program to the program environment used at their centre (see also Section 4 of these *Teachers' Notes*)

- Here are the e-mail addresses of the AQA Programmers for each language who will be available **from 1 March until the day before the examination**.

aqaprogrammerzz1@yahoo.co.uk

Pascal, VB.NET and VB6

aqaprogrammerz2@yahoo.co.uk

Python

aqaprogrammerz3@yahoo.co.uk

C, C# and PHP

aqaprogrammerz4@yahoo.co.uk

Java

- Programmers will only enter into a dialogue with teachers from a centre. **Candidates are not allowed to amend a Skeleton Program and use that Skeleton Program in the examination without the approval of that Skeleton Program by an AQA Programmer via a teacher.**
- Send an e-mail to your Programmer, supplying the following information.
 - i. In the subject line: your centre number, centre name, the name of your programming language and the program environment.
 - ii. The name and phone number (and extension, if applicable) of the person the Programmer should contact at the centre about the amendments made to the Skeleton Program.
 - iii. Your amended Skeleton Program as an attachment. Please indicate in some way, or explain, where you have made amendments.
- If your amendment is acceptable, you will be sent an e-mail confirming this. If it is not, you will be contacted by e-mail or phone by an AQA Programmer (between 9 am and 4 pm during the school day, if by phone), normally within 24 hours (or by the following Monday, if you e-mail on a Friday).
- The Programmer is there to check on *your* amendments to the AQA Skeleton Program that will, typically, only relate to the provision of programming libraries for basic input and output. Programmers are not there to make the amendments for you. The Programmer is there to ensure that your amendments neither advantage nor disadvantage your candidates. The Programmer can **only** discuss the amendments needed to amend the AQA's Skeleton Program to your program environment for use in the examination.
- Once amendments are approved, you will be asked to send immediately the final version of your amended and approved Skeleton Program to the Programmer as an e-mail attachment.

- **Important**

After the examination, put one copy of your *amended and approved* Skeleton Program on top of your candidates' completed Electronic Answer Documents when you send them to the **examiner** allocated to your centre (not the AQA Programmer). Your Examinations Officer will have the name of your centre's examiner.

END OF TEACHER'S NOTES