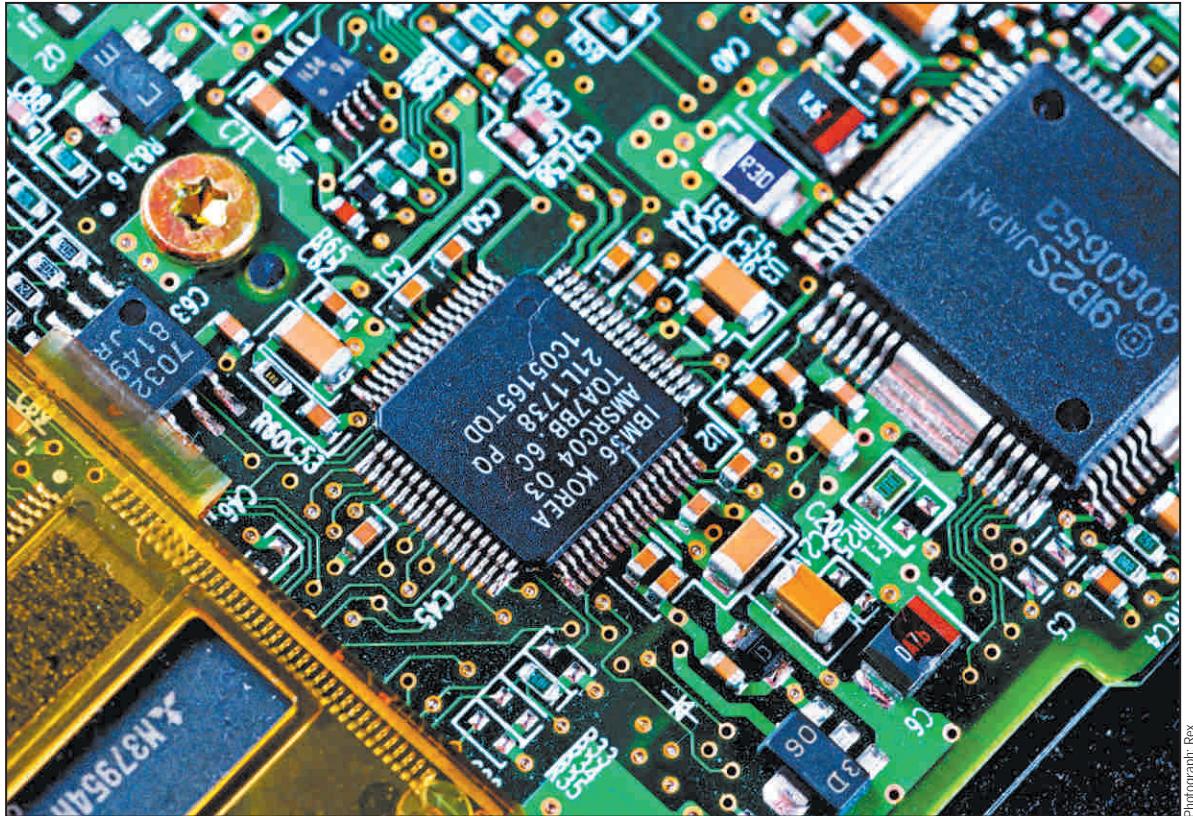


# Computing



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**C**OMPUTING is a varied subject and each of the SQA courses bearing the name covers a wide area. This guide will lay out the main themes within individual courses and give those preparing for one of the exams some important tips on how to approach them.

The courses covered here will be **Standard Grade Computing Studies, Higher Computing and Intermediate 2 Computing**. There are other levels in the Computing Studies strand and there is the whole Information Systems subject group – from Intermediate 2 to Advanced Higher – but they will not be covered here.

#### EXAM PREPARATION

Preparation is everything. If you go into an exam without preparing in advance you will be costing yourself vital marks before you even pick up a pen. Below are a few tips that will help you in whatever exam you are sitting...

- Find out exactly when and where each of your exams is being held. The SQA exam timetable is already published and is available from its website ([www.sqa.org.uk](http://www.sqa.org.uk)). Get yourself a copy and plan your revision now. Remember to allow enough time to get to where the exam is being held. It is better to be there half an hour early than fifteen minutes late.
- When you do turn up for the exam make sure you have a spare pen or pencil. If it is a Computing paper, or any other science/maths subject, make sure your calculator is working properly. Leave your mobile at home. Being able to phone your friends to let them know you have finished is not worth the risk of losing the exam

because you forgot to leave the phone outside of the exam room.

- Set aside enough time for each of your subjects during the week, at least an hour for each of your Higher subjects and a bit less if you are sitting a Standard Grade. Try not to spend more than 45 minutes on one subject. Do a couple of different subjects each day – think of it as adding an extra couple of periods to your normal timetable.
- Make sure you don't get too stressed. You need to take breaks during study and even a night off can help reduce stress levels. Go for a walk or have a cup of tea before study. Make sure that the room you study in is not too warm or noisy. Music on in the background can help; choose something quiet that you cannot sing along to! If you are getting stressed, talk to someone you trust about it. Self knowledge is a sign of strength not weakness.
- Identify what will be in the exam you are sitting. If you can get a copy of the SQA content grids from your teacher, or you can find them on the SQA website, you can sort out the facts you need to know from the other stuff you picked up during the year. Make sure that you know how the paper is laid out. Remember, some of the older past papers will be different from the exam you will sit. If your exam has options, make sure that you know which one you are studying. It may sound strange, but every year there are a few candidates who try to answer all the questions in more than one option in the Intermediate or Higher papers.
- The content grids are also useful for traffic lighting. Get a red, a yellow and a green pencil (or highlighter). Colour, or underline, the parts of the grid you have "never heard of" red. Green is for the

stuff you know well and yellow is for the topics that you are unsure of. This technique can help you focus your revision on the areas that cause you problems. Start on any red topics, as questions on these will floor you in an exam. Once you have learnt them well enough, move on to the yellow topics.

- Make up your own glossary of key terms – this is particularly useful in Computing subjects where there is a lot of technical jargon. If you can write down all the words you are supposed to know, together with their meanings in your own words, this will improve your chances of learning them and being able to remember them in an exam.
- Use mind-mapping to help you structure knowledge of each topic. Draw a diagram of the key points of each course on a big sheet of paper. Use a different colour to identify key themes and try to draw, or stick, pictures/clip art on the sheet to help you visualise the map.
- Get a copy of a revision guide. It will show you the course in a different way from the notes your teacher gave you and may allow you to plug gaps in your knowledge. It might also give you valuable tips for the exam, or even practice exam questions. There are a couple to choose from so you should have a look at them all and choose the best for you. Ask your teacher or lecturer which they would recommend and why.
- Try looking at revision websites. Remember that the internet contains a lot of rubbish as well as the informative websites. Ask your teacher for a list of sites that might help you.
- You need to make your own notes. Try making up small cards with facts or frequently asked

#### ABOUT THE AUTHOR

JOHN Mason is principal teacher of Computing and Information Systems at Balwearie High School in Fife. He is the co-author of two successful Computing textbooks and was a member of the team that wrote units for the new courses and NAB assessments at Intermediate 2, Higher and Advanced Higher Computing. He has also worked as a marker, examiner, moderator and exam setter for SQA.

questions on them. If you are a more visual learner, like me, try creating a diagram that explains what you need to know. Reading textbooks or course booklets is not studying – it's just reading. Learning has to be active!

● Start a study group. Get one or two people working on the same subjects as you together and ask each other revision questions. Turn it into a game or competition. If that is not going to work, because you are just all going to sit and chat, get your gran to ask you 20 questions before she goes out to the bingo! Even this will help you to highlight weaknesses.

● Have a look at past exam papers. Your school or college may provide these. If not, your local bookshop can get them for you. Read them carefully. Try to spot the type of questions that come up every year. If you have an answer ready for these questions, then you have given yourself a good start.

● Your teachers are a great source of information and are full of useful hints on how and what to study. They know the exam system, they may even be exam markers, and can give you tips on how to structure your answers to make the most of what you do know.

● Find a system that works for you and stick to it. Everybody is different and learns differently, the important thing is that you learn effectively and pass that exam.

### STRUCTURE OF EXAM QUESTIONS

So, once you have worked out which level of Computing you are studying, found out where you are sitting the exam and got yourself to the exam room in time, the fun begins in earnest! The next trick is to figure out what the person who wrote the questions is actually looking for. Remember that the paper is probably written a good 18 months before you get a chance to see it and the person marking it will be sitting with a marking scheme working out how many 'ticks' your answer deserves.

The first thing you do is read the whole paper once quickly. This will jog your memory and make answering the questions easier when you read them properly. You should have an idea of how many minutes per mark you have – it is about a minute a mark for Higher Computing. This will help you stay on track and not fall behind or run out of time before attempting all the questions you are supposed to.

Take account of how many marks each question is worth and shape your answer to match. The wording of questions can also give you a clue ...

● "state" and "name" are usually fairly straightforward and need a couple of words or a short phrase to gain each of the marks.

● "describe" means that you have to go a bit further and you should also answer in sentences if possible. A series of bullet points is great if you have trouble with longer answers. One bullet per mark! ● "explain" is trickier still. Answers here usually go something like: "The printer driver was not installed properly, therefore the page did not print properly or at all", or "The CD-ROM disk is not a suitable backing storage medium, because its contents are fixed and no further files can be written to it." They have two parts – a cause and an effect.

● Watch for wording like "... in this context." or "... for this situation." These are particularly common in problem solving questions and mean that at least some of the marks hang on your ability to link the theory of the course to this new or unusual scenario. Always make sure that you refer to the context of the question, even if the "real world" examples they use seem a little far-fetched.

**Knowledge and Understanding (KU)** questions test recall of facts and understanding of concepts. Typical Standard Grade KU questions would look something like this ...

- Name the two types of computer memory.
- State the function of a printer driver.
- Describe how a spell checker is used to correct errors.
- Name two of the joints in a robot arm.

**Problem Solving (PS)** questions are harder to answer because it is often more difficult to spot which part of the course applies. Typical Higher PS questions might be...

- Describe the additional hardware and software that Careywyn will need to carry out this task.
- Explain why a vector graphic package is not suitable here.

- State one advantage of using an interpreter, rather than a compiler, for this task.
- Calculate the size of the uncompressed sound file that will be stored.

The content at each level is laid out in the SQA content grids. It is these grids that the exam writers use when they write their questions. Learn the topics at your level thoroughly. Some topics come up every year – learn answers to these standard questions and you will be able to adapt them to the questions in your paper.

When you finish a question, read quickly over your answer and try to think like a marker. If the question is worth three marks, can you tick three valid points? Does what you have written make sense? Would a quick sketch or diagram help? Should you give a quick example to illustrate what you mean?

### STANDARD GRADE

You are about to sit your Standard Grade Computing Studies exam. With any luck you have already given yourself a fighting chance by getting a good mark for your practical coursework during the last two years. The Practical Abilities grade counts as 40% of the overall grade and can make all the difference to your final award, no matter what your level is. There are three levels in Standard Grade. You will be sitting two exams, either Foundation and General or General and Credit. Your exam will be one hour 45 minutes at Credit, one hour 30 minutes at General and one hour 15 minutes at Foundation.

Each exam is about six or seven questions long and contains 36 marks in Knowledge and Understanding and 36 marks in Problem Solving. The exam papers have spaces for writing the answer directly onto the booklet.

The main areas covered by the course are:

#### General Purpose Packages

This covers word processing, spreadsheets, databases, graphics, web page design, multi-media, expert systems and desktop publishing. It also covers common features of the above packages together with the social/legal/economic implications of their introduction. You should make sure that you understand, and are able to describe, the following Credit GPP topics as they come up regularly:

- The three laws (Data Protection, Computer Misuse, Copyright Designs & Patents).
- Data types and standard file formats.
- Use of templates, keyboard shortcuts, online help and online tutorials.
- Description of mail merge and static/dynamic links.
- The IF function and absolute/relative references.
- Complex searches on the web or in a database.
- Field types (text, number, date and particularly computed fields).
- Audio/video capture and OCR.
- Description and advantages of expert systems.

#### Computer Systems

This unit looks at systems software, different hardware devices, types of memory and the structure of the processor. It also focuses on how data is stored and how operating systems work. Typical systems questions at Credit are:

- Descriptions of the function of ALU, Control unit and registers.
- Describe the function of the four main parts of an operating system.
- Comparison of compilers and interpreters.
- Portability of software.
- Features of high level languages.
- Specialised input/output devices for multi-media, VR and disabled users.
- Need for sound/graphics cards.
- Comparison of backing storage in terms of capacity, speed and cost per megabyte.

Practice setting out your calculations of file sizes. A typical calculation could be to work out the size of a black and white image that is 480 by 640 pixels. It should look something like this...

- Total number of pixels = 480 x 640 = 307200
- One bit per pixel
- Image size = 307200/8 = 38400 bytes
- Size in kilobytes = 38400/1024 = 37.5 Kb

Remember to reduce any calculation to appropriate units and to round the correct way for the question.

#### Communications and Networks

This unit covers the hardware and software used in networks, as well as how they are used and how they have changed society. Typical questions would cover the following ...

- Transmission media used in LANs and WANs.
- Network Interface Cards, dialup and broadband
- Advantages of email, including the use of attachments.
- Security, including encryption and passwords.
- Client/Server networks, multi-access systems.
- Shareware, freeware and commercial software
- Social, legal and ethical issues.

#### Commercial Data Processing

Our personal data is held on literally thousands of computers. This unit deals with how this data is used and how the use of computers in this way has changed society. Typical questions would cover:

- How data is used in companies to improve profits, targeting sales and cutting waste.
- The stages of the data processing cycle.
- Methods of collecting data, including smart-cards, OCR and MICR.
- Validation techniques (check digit, length/range/presence check).
- Verification of data by prompting user to check data, or double entry.
- Job types (systems analyst, programmer, engineer, network manager).
- E-commerce, EFTPOS, security and fraud
- Social, legal and ethical issues.

#### Automated Systems

Robots and other systems now play a huge role in our society. This unit deals with the effects of their growing use. Typical questions would cover:

- Methods of guiding robots.
- Adaptability of robots by changing tools and reprogramming.
- Control languages, ROM software and embedded systems.
- The use of sensors, interfaces and Analogue to Digital converters.
- Social, legal and ethical issues.

#### THE EXAM

There will always be questions on the first three GPP topics and one or more questions from the final two sections above, with other parts of the course woven into the scenarios. There will be no programming questions, although you may be asked about features of high level languages and other related topics mentioned above.

#### HIGHER

If you are sitting the Higher Computing exam, you have already jumped through a few hoops on the way here. The NAB tests and prelim exams your school or college used will have given you some idea of what to expect. You will also have completed the coursework task and will have upto 60 marks in the bag already. Your exam will be two and a half hours long and you will attempt 140 marks worth of questions. This works out at about one minute a mark – worth keeping an eye on that fact. If you don't have one of the textbooks or revision guides, there are quite a few online resources available to you. Your school or college probably subscribe to SCHOLAR, so get a hold of your password and get on there. There are notes, self-tests and revision guides. The SQA website itself has marking schemes for sample papers and the 2005 and 2006 papers available for download. These will give you insights into what the markers are looking for in your answers if similar questions come up again this year. There are a few other sites, mostly run by schools and colleges, which can give advice and practice.

The course is split into two core units and one option. I will come back to the optional topics later. The two core topics are Computer Systems and Software Development. They are examined in Sections I and II of the exam, with Section III covering the option topic.

#### Computer Systems

This core unit covers data representation. **Turn to page 28**

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**From page 27**

computer structure, peripherals, networking and computer software. It is a fairly wide-ranging unit and has lots of terms for you to remember. Make up a glossary, using explanations that make sense to you, if you are having difficulty recalling them.

**Software Development**

This core unit covers the software development process, software development environments, high level language constructs and standard algorithms. There is not as much content to learn here, but your problem-solving skills are definitely going to be tested during these questions.

There are three optional units on offer in Section III. Your school or college will probably have made the choice of which one you will study, based upon local expertise and resources, rather than you selecting the one which appeals most. Make sure that you know which option you are supposed to answer questions on in the exam. The three optional topics, in the order they are in the paper, are Artificial Intelligence, Computer Networking and Multimedia Technology.

**Artificial Intelligence**

The first option unit covers the development of artificial intelligence, its applications and uses (including neural nets, vision systems, natural language processing, embedded technology, intelligent robots and expert systems), search techniques and knowledge representation. There are a lot of topics to cover and a wide range of questions that can be asked in the exam. Make sure that you study the "set piece" answers that your teacher will have pointed out to you. Practise the Prolog-type questions in particular as they are always worth quite a few marks and are fairly straightforward if you follow the rules.

**Computer Networking**

This option unit covers network protocols, network applications, network security and data

transmission. It has a lot of content to cover and quite an extensive list of technical terms for you to remember. Make up your own glossary of words and phrases to help you get them fixed in your mind. There are several topics that come up regularly and these should be practised.

**Multimedia Technology**

The topics in this option are the development process for multimedia applications, bit-mapped graphic data, digitised and/or synthesised sound data, video data, vector graphics data and the implications of the use of multimedia technology. The unit has a wide range of possible questions, all of which are loaded with technical terms. A glossary of common words and phrases will help here, as will getting practice in the various calculations in the topic. Make sure that you practise your calculations of graphic/sound/video file sizes as these should be easy marks if you follow the format.

**THE EXAM**

**Section I**

The first section of the exam contains 30 marks worth of questions drawn equally from the two core topics. These are short response questions and are more straightforward in wording. They are worth two or three marks each and are similar in level of difficulty to the type of questions you met in your NAB tests, but these are not multiple choice. There are twice as many knowledge questions as problem solving. Your answers will be short phrases or, at most, a few sentences long. Typical questions in Section I might be ...

- ... from Computer Systems:
- Name and draw a labelled diagram of a suitable network for a LAN in a small office.
- State the 8 bit twos complement representation of the number -121.
- State two functions of an interface.
- Describe the function of a defragmentation program.
- Describe how FLOPs are used to measure processor performance.
- Describe the function of a bootstrap loader.

- ... from Software Development:
- Analysis is the first stage of the software development process. Describe this stage.
- Name two types of software maintenance.
- Describe what is meant by the iterative nature of the software development process.
- Explain how the use of a module library can speed up the development of software.
- Name a graphical design method. Use a diagram to illustrate your answer.

**Section II**

After the "warm up" of the first section comes Section II, with its extended response questions. There are 60 marks worth of questions in Section II, again drawn equally from the two core topics. Instead of the short two or three mark questions, each question is built around a central theme or scenario. These questions are usually between eight and 18 marks long. The introduction paragraph, or stem, of each question may contain information vital to a successful answer. These questions are much more difficult than the questions in the NAB tests, containing twice as many problem solving questions as knowledge and understanding and having a few marks in each which are aimed specifically at A-grade candidates. Your answers to some of the questions will be short paragraphs or longer. Typical questions in Section II might be ...

- ... from Computer Systems
- Describe, referring to appropriate buses and control lines, the steps in the fetch-execute cycle
- Calculate the maximum size of addressable memory in a computer with a 32 bit data bus and a 24 bit address bus.
- Describe two things that Gerry can do to increase the system performance of his computer.
- Explain the effect of Kerry upgrading her printer by adding more RAM.
- Describe one advantage that installing a client server network in a large office has over continuing with the existing peer-to-peer network.
- Describe how memory is allocated in a single user operating system.
- Explain why a trojan horse is not a virus.
- ... from Software Development



- Use pseudocode to show how the name entered is found in the list of members' names.
- Describe, using examples to illustrate your answer, the three kinds of data that should be used to test the program that calculates the total score of three darts in a darts game.
- Explain whether each of the four variables is passed by reference or by value.
- State three things that would make the program more maintainable.
- Explain why the use of parameter passing and local variables would make software more portable.
- Explain why an event-driven language would be more suitable for producing the training software.
- Using a language of your choice, show how the last three letters of a name could be saved in the variable called "ending\$".
- Using pseudocode, show how the highest mark in the Computing array is printed out.

**Section III**

The third section covers the more specialised topic that you have studied as your option. There are 50 marks worth of extended response questions in each part. As with Section II, each of these larger questions is built around a central theme or scenario, with a stem containing important information and focussing more on problem solving. The difficulty range of questions ranges from the easier C level KU question to the more difficult parts, often at the end of the question, aimed specifically at A-grade candidates. **Part A: Artificial Intelligence**  
Typical questions in Artificial Intelligence might be...

**Arts, Languages & Social Sciences**  
**Computing Administration, Business & Management**  
**Beauty, Hairdressing & Complementary Therapies**  
**Highers Health Sport Care & Social Work**  
**Maths, Science & Engineering**  
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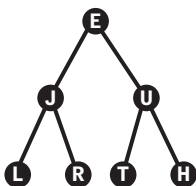
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While most computers come complete with a mouse, there are other input devices available

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- State two aspects of intelligence that should be present in an AI system.
- Describe why a semantic net might be used to speed up the creation of an expert system.
- Explain what is meant by a restricted domain.
- State two hardware developments that have supported the development of AI.
- Explain how a neural net may be trained.
- Two stages of computer vision are image acquisition and image understanding. Name two others.
- Explain the difference between dumb and intelligent robots.
- Description of the function of the inference engine within an expert system.
- Explain what is meant by a combinatorial explosion.
- State the meaning of the terms sub-goal, instantiate and backtracking.
- Use the letters on the search tree below to show the order of nodes visited using a depth-first and breadth-first search.



- Describe one advantage of breadth-first over depth-first and one advantage of depth-first over breadth-first.

- Use an example from the knowledge base to explain the meaning of the terms inheritance and recursion.

Problem solving questions often require candidates to solve queries, write rules and do a trace using facts and rules written in a Prolog-like syntax. The contexts of these are varied and in the past have included mountain identification, musical instruments and personnel records.

If you keep your wits about you, there are plenty of marks for the asking here. Make sure that you get plenty of practice doing traces of solutions. Get a hold of past papers and try every example you can lay your hands on. They are a bit like logic puzzles: once you have the knack you can solve them quickly. Make sure that you learn how to structure your answer and to use the correct terminology.

A short example of a trace on a query to find out if a violin is a musical instrument might be...

- Goal is instrument (violin).
- Match at line 8, subgoal brass(X), X instantiated to violin.
- No matches found, subgoal fails, backtracking.
- Match at line 12, subgoal string(X), X instantiated to violin.
- Match at line 14, subgoal succeeds.
- Goal succeeds.

Another possible extended exercise would be the creation of a semantic net from a given set of facts or the writing of facts from a semantic net. This can be tricky to do but if you remember that every line on a semantic net corresponds to a fact you won't go far wrong.

**Part B: Computer Networking**

Typical questions in Computer Networking might be ...

- Describe the application and transport layers of the OSI model.
- Describe the structure of a class C IP address.
- The <title> HTML tag is used in web pages. State examples of two other HTML tags.
- Explain how search engines use spiders to build indexes.
- Describe how the Regulation of Investigatory Powers Act 2000 affects Paula here.
- Describe a network-based denial of service attack. Your answer should refer to one cost to the company attacked.
- Describe two disaster avoidance strategies for a school network.
- Describe how Stuart's file is transmitted over a network using TCP/IP.
- State why a MAC address is required when transmitting data over a network.
- State two ways in which the Chan family benefits from having an internet connection when booking their holiday.
- Describe two software security measures that the Network Manager can implement.
- Describe how firewalls and walled gardens are used to filter Internet content.
- Describe how mirror disks are used within a backup strategy.
- Explain the difference between synchronous and asynchronous data transmission.
- Describe how CRC is used in the error checking during data transmission.


  
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Turn to page 30

**From page 29**

The major difficulty inherent in the Computer Networks unit is the sheer volume of facts to be learnt. There are dozens of acronyms to be deciphered and technical jargon to be mastered. If you do not have a good memory try mind mapping as a good way to help you structure your knowledge. Use colour and simple diagrams to help you to sort the material into groups and to help you learn it. Make sure you have a firm grasp of the common themes like protocols and security. Problem solving questions are heavily scenario-based and your success will rely upon your ability to spot the relevant facts in the stem and other parts of the question. Do not be afraid to use a pencil to underline key points in the question during your first read through, this might stop you making a mistake when tackling the later parts of bigger questions. This topic had some of the longest questions in the 2006 paper.

**Part C: Multimedia Technology**  
Typical questions in Multimedia Technology might be...

- Describe one advantage of a WYSIWYG editor, rather than a text editor, to create web pages
- Explain the terms "streaming" and "embedded files" when talking about a multimedia application.
- Describe the function of a CCD and an ADC in the capturing of a digital image.
- Describe how a GPU allow effects to be applied by a graphics card.
- Describe two factors, other than the length of song, which would affect the size of an MP3 file.
- Explain how Run Length Encoding is used to compress a bitmap graphic.
- Describe two attributes of a square in a vector graphic.
- State two common attributes of notes stored in MIDI format.
- Describe how advances in network technologies have promoted the use of multimedia.

● Explain what is meant by the term convergent technologies.

● Describe one item of hardware and one item of software needed to create this online catalogue.

One key skill in the quest to gain marks in the Multimedia Technology topic is how to lay out calculations. There are several calculation questions to choose from; here are two worked examples...

**Example 1**

Calculate the file size of a 34 second 16 bit stereo sound clip captured at 22 KHz.

● File Size = Sample Freq x Time x Sample Depth (in bytes) x Channels  
 = 22000 x 34 x 2 x 2 bytes  
 = 2992000 / 1024 = 2921.875 Kb  
 = 2.85 Mb

**Example 2**

Calculate the size of an uncompressed 4 minute video file taken at 25 fps.

Each frame is 512 by 500 pixels and is in 32 bit colour.

● Number of frames = Video Time (s) x Frame Rate (fps)

Size of one frame = pixels per frame x Colour Depth (bytes)

File size of clip

Multimedia Technology is largely to do with the application of the theory in a number of real life contexts. Watch for the details in the questions and remember not to waffle, just stick to the facts!

**INTERMEDIATE 2**

This course has the same structure as the Higher and a lot of the advice offered in the Higher section above also applies here. The two core units

and three options have the same titles and cover the same or similar ground; it just doesn't go as deep at Intermediate 2. This course was originally designed for S5/6 pupils who wanted to progress in Computing but did not want to go as far as Higher. The course is broadly equivalent to the top end of Standard Grade Credit. In recent years a number of schools and colleges have started offering this course in S3/4 as an alternative to Standard Grade. Whichever kind of candidate you are you will have completed the coursework task and will have upto 30 marks on your scorecard already. Your exam will ask you 70 marks worth of questions in one and a half hours. Not many textbooks are available, but there are notes and online resources you could use. Ask your teacher for some advice. The SQA website has marking schemes for sample papers and the 2005 and 2006 papers available for download. Have a look at these and note which types of question come up regularly; it is well worth rehearsing set-piece answers to these.

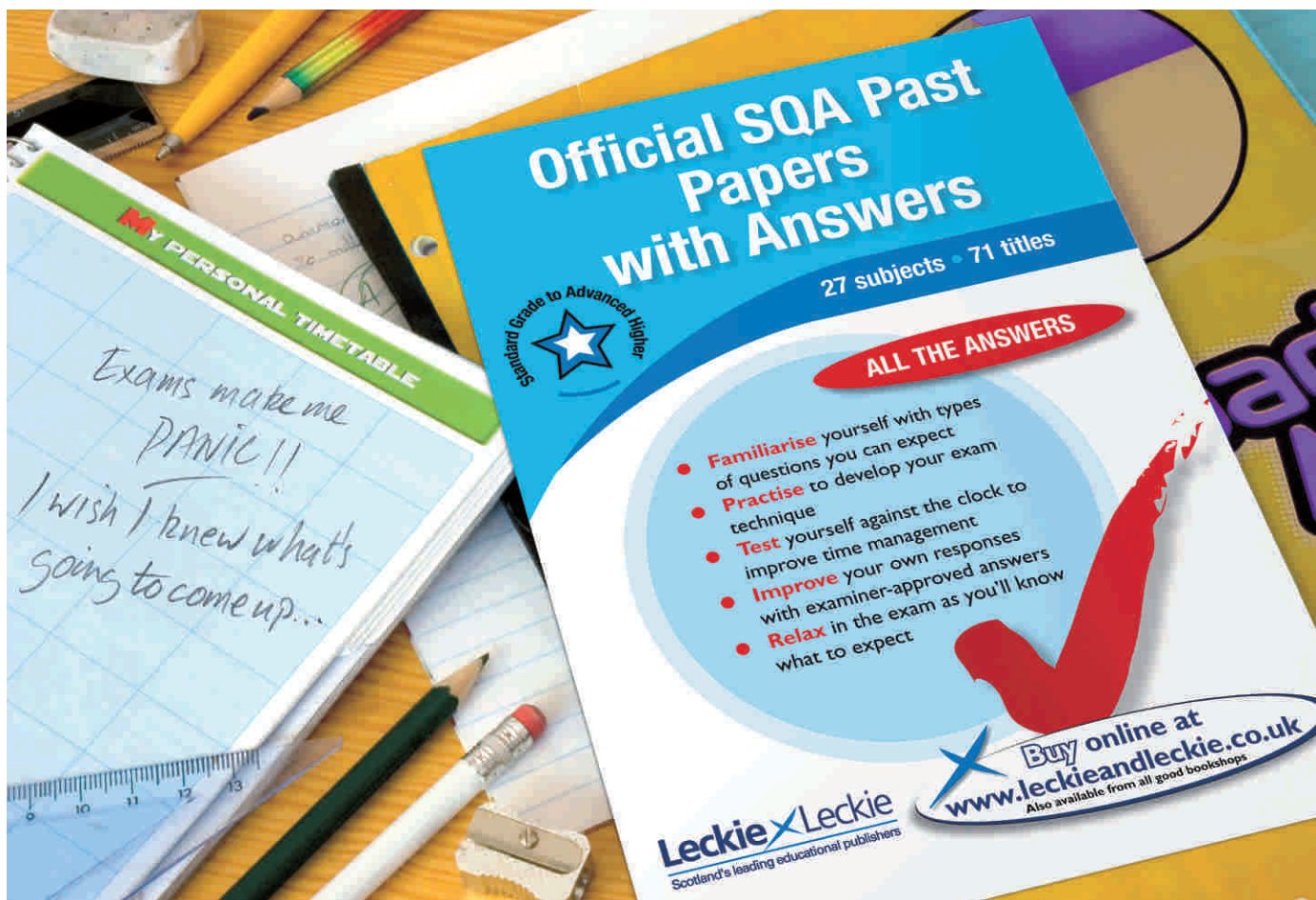
**THE EXAM**

**Section I** is worth 15 marks and these are drawn from the two core units. The questions are objective and/or short response aiming at about the same level as a NAB. The questions test both knowledge and understanding and problem solving (10 marks KU and five marks PS)

**Section II** consists of 30 marks worth of questions requiring extended responses. The 20 marks of problem solving will be set in more complex contexts. All questions will come from the two core units.

Typical questions in Sections I and II might be:

- ... from Computer Systems
- State the 8 bit binary representation of 194 and the integer equivalent of 10000110.
- Describe how floating point numbers are used to represent very large numbers.
- Gerry's computer has an extended character set. What is a "character set"?



- Name and describe the function of two of the parts of a processor.
- Describe how clock speed is used as an indicator of system performance.
- Kerry could use a digital camera or a scanner to capture the document. Recommend one of these devices and justify your answer.
- Explain why an LCD screen is more suitable in this context.
- Explain two advantages of using a DVD-RW instead of a hard disk for this task.
- State two functions of an interface.
- Alistair recommends a client server network. Describe two functions of a server.
- Describe why International Pencils would like to install a LAN in their head office.
- Explain the difference between a browser and a search engine.
- Description of features of Computer Misuse Act, Copyright Designs & Patents Act and Data Protection Act.
- Explain why a standard file format would be useful when distributing the file to her employees.
- Describe two differences between an ASCII file and an RTF file.
- What is a virus? Describe two common symptoms of virus infection.

... from Software Development

- State which two stages are missing from the list: analysis, design, testing, evaluation and maintenance.
- Describe the function of the analysis and maintenance phases of the software development process.
- State the purpose of pseudocode.
- Name one graphical design notation and state one advantage it has over pseudocode.
- Test data is being constructed for a program handing test marks as whole percentages. State two examples each of normal, extreme and exceptional test data that should be used.
- Describe how an interpreter translates a program.
- State two features of a high level language.
- State the type of program that is used to type in and edit programs.
- Using a programming language of your choice, write a complex condition to identify a number in the range 18 to 30.
- Describe what is meant by a "nested loop".
- Describe the data type and data structure that would be needed to store a list of ten surnames.
- State one example of a pre-defined function.
- Explain why the use of pre-defined functions might speed up the creation of a program.
- The subroutine calculates the fastest time in the array holding the 100m results. Name the standard algorithm used here.

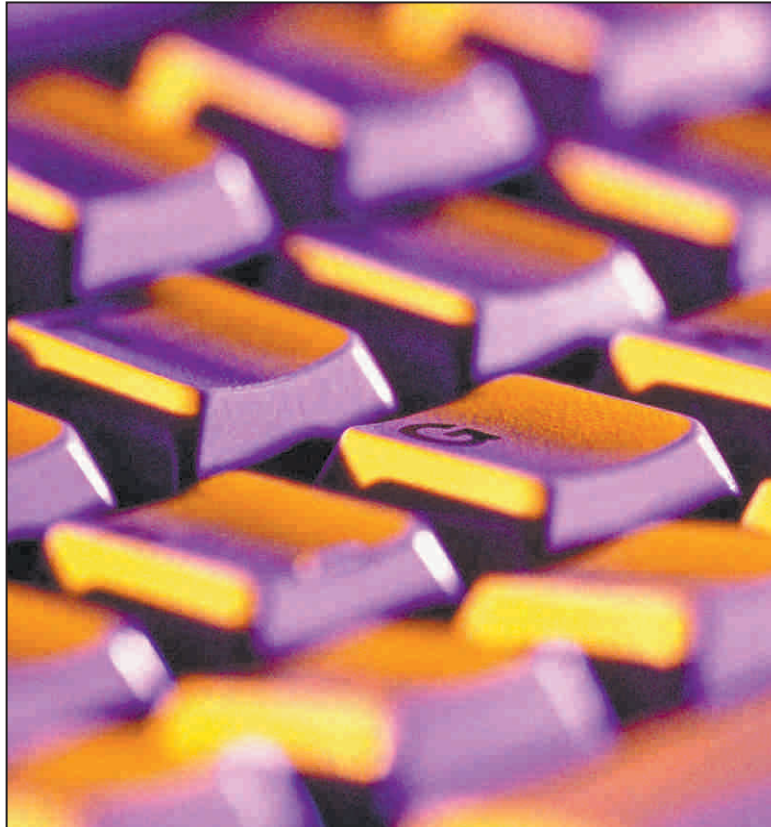
**Section III**

In this section you will tackle 25 marks worth of extended response questions in the option you have studied – from the choice of Artificial Intelligence, Computer Networking and Multimedia Technology. You will do all of the questions within one sub-section. The split of KU to PS is the same as in section II and there will be some core material thrown in to test integration of knowledge.

**Part A: Artificial Intelligence**

- A good start, if you are studying this topic, would be to learn the history of the development of AI, think about possible ethical/legal issues and practice the Prolog-like pattern matching exercises, including the trace. Other typical questions in Artificial Intelligence might be ...
- Describe two features of human intelligence that AI is trying to mimic.
  - Describe how the Turing test is used.
  - Describe the role of the Knowledge Engineer and Domain Expert in creating an expert system.
  - State two advantages of expert systems over human experts.
  - Describe one practical use of an artificial neural system
  - State two problems that the vision system would have to overcome.
  - Describe how Frank's computer is able to interpret his spoken commands.
  - Describe two factors affecting the accuracy of speech recognition.
  - How does Jonny train his palmtop computer to understand his handwriting?
  - Describe two of the sensors that the mine rescue robot might have.
  - Use the numbers to show the order in which the nodes are visited using a depth-first search.

Photograph: Rex



- Construct a semantic net to represent the facts and rules in Peter's goldfish expert system.
- Explain the meaning of the terms goal, sub-goal and trace.

**Part B: Computer Networking**

- Issues of security are always popular with question writers, as are hardware-based questions, social/ethical issues and lists of abbreviations/TLAs. Some typical questions in Computer Networking might be ...
- Explain the four parts of the following URL: [www.evilweasels.co.uk](http://www.evilweasels.co.uk)
  - Why does Morag need an ISP?
  - State two features of the Regulation of Investigatory Powers Act 2000.
  - Explain why Carrick Industries would use encryption on sensitive files.
  - Katie and Morag regularly talk in a chat room. State two precautions they should take to minimise personal risk.
  - Describe a wireless personal area network.
  - Describe two advances in hardware technology that have supported the development of LANs.
  - State two items of hardware that the school will have to be able to set up their LAN.
  - State one advantage of ADSL over leased line for connecting the branches to head office.
  - Explain the terms broadband and dial-up.
  - Describe the role of the DNS in finding the site [www.geekology.ac.uk](http://www.geekology.ac.uk)

**Part C: Multi-media Technology**

- A key feature of this unit is to be able to describe the software development process as it applies to the development of multimedia applications. Also make sure you have the file formats and calculations word perfect. Other typical questions in Multimedia Technology might be...
- WYSIWYG editors and text editors can be used to create web pages. Give one advantage of each over the other for the creation of a school webpage.
  - Name one graphic format that uses lossy compression.
  - The GIF file format uses transparency. Explain the term transparency.
  - How many colours can be represented in 24 bit colour?
  - Calculate the file size of a 4" square uncompressed graphic captured at 300 dpi in 8-bit colour.

- Name two items of hardware required to capture sound data.
- Describe one way, other than compression, in which simple sound editing software could be used to decrease the file size of an audio clip.
- What is meant by the term frame rate (fps)?
- State two common attributes of vector graphic objects.
- Describe virtual reality mark-up language (VRML) and give an example of its use.
- Describe three common attributes of notes stored as MIDI data.

Well that is what is in store for you in Computing! Remember the three golden rules...  
 ● Make sure that you prepare well.  
 ● Be relaxed, as stress just gets in the way.  
 ● Stay sharp, as you don't want to lose marks to silly errors.  
 Good luck ;-)

COMPUTING EXAM TIMETABLE	
Level/Paper	Time
<b>Wednesday May 2</b>	
Foundation/General	9am-10am
	10.20am-11.35am
General/Credit	9am-10.15am
	10.35am-12.20pm
<b>Monday May 28</b>	
Intermediate 2	1pm-2.30pm
Higher	1pm-3.30pm
Advanced Higher	1pm-3.30pm
Intermediate 1	1pm-2pm

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