basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

COMPUTER APPLICATIONS TECHNOLOGY

EXAMINATION GUIDELINES

GRADE 12

2017

These guidelines consist of 14 pages.

TABLE OF CONTENTS

1. INTRODUCTION

The Curriculum and Assessment Policy Statement (CAPS) for Computer Applications Technology outlines the nature and purpose of the subject Computer Applications Technology. This guides the philosophy underlying the teaching and assessment of the subject in Grade 12.

The purpose of these Examination Guidelines is to:

- Provide clarity on the depth and scope of the content to be assessed in the Grade 12 National Senior Certificate (NSC) Examination in Computer Applications Technology.
- Assist teachers to adequately prepare learners for the examinations.

This document deals with the final Grade 12 external examinations. It does not deal in any depth with the School-Based Assessment (SBA).

These Examination Guidelines should be read in conjunction with:

- The *National Curriculum Statement (NCS) Curriculum and Assessment Policy Statement (CAPS):* Computer Applications Technology, specifically
  - Section 3 – Content and scope per topic
  - Section 4 – Assessment in Computer Applications Technology
- Government Gazette No. 31337 of 29 August 2008 (Regulations pertaining to the conduct, administration and management of assessment for the National Senior Certificate), specifically Annexure G
- The National Protocol of Assessment: *An addendum to the policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), regarding the National Protocol for Assessment (Grades R–12)*
- The national policy pertaining to the programme and promotion requirements of the National Curriculum Statement, Grades R–12

Teachers must take note that these are guidelines and changes and developments in the technological environment should be taken into consideration when topics are taught. Recent past CAPS examination question papers should be used as preparation for the examination.

2. COGNITIVE DEMAND AND LEVELS OF DIFFICULTY

2.1 Cognitive demand

Each question in these question papers is evaluated in terms of its cognitive demand and its level of difficulty.

LEVEL	TAXONOMY	DESCRIPTION
L1/C1	Routine procedures (Knowledge, Remembering)	Recall of factual/process knowledge **in isolation**, i.e. one step/set of basic steps/instruction/process at a time, e.g. definitions in the theory section and simple procedures found in the application packages.
L2/C2	Multi-step procedures (Understanding, Applying)	Demonstrates **understanding** of steps/processes/isolatable bits, such as translating from one form of representation to another, e.g. translating pictures, symbols, diagrams, screenshots, 'words'/mathematical equations into e.g. spreadsheet formulas. These questions could include reproduction of aspects of documents. It also requires using **known routines/steps/processes** in a familiar context in order to complete a task, where **all of the information required is immediately available to the learner.**
L3/C3	Problem-solving (Analysing, Evaluating, Creating)	Requires **reasoning/investigation/developing a plan** or sequence of steps; has some complexity where candidates need to see how parts relate to a whole and completing a task could have more than one possible approach. It could also require weighing possibilities, deciding on most appropriate solution and testing to locate errors/troubleshooting as well as pattern recognition and generalisation. These questions will comprise actions/strategies/procedures where candidates are required to create their own solutions to challenges different to those learners may have encountered in the classroom. These questions could include analysing documents or data, and decision-making.

2.2 Levels of difficulty

Levels of difficulty are categorised as follows:

D1: Easy for the average Grade 12 candidate to answer
D2: Moderately challenging for the average Grade 12 candidate to answer
D3: Difficult for the average Grade 12 candidate to answer
D4: Very difficult for the average Grade 12 candidate to answer. The skills and knowledge required to answer the questions at this level allow for an A-grade candidate (extremely high-achieving/ability learner) to be discriminated from other high-ability/proficiency candidates.

In judging the level of difficulty of each question, both the demands that each question makes on the cognitive ability of an average Grade 12 CAT learner and the intrinsic difficulty of the question or task is considered. In making this judgement, the difficulty or ease of a particular question is identified. A four-category framework **for thinking about question or item difficulty** adapted from Leong (2006) has been used in this identification process. This framework comprises the following four general categories of difficulty:

- **Content difficulty:** This indexes the difficulty of the subject matter, topic or conceptual knowledge; some content is inherently more difficult than other content.
- **Stimulus difficulty:** This relates to the linguistic features of the question and the challenge that candidates face in reading, interpreting and understanding the question.
- **Task difficulty:** This refers to the difficulty that candidates face when trying to formulate or produce an answer.
- **Expected response difficulty:** This refers to difficulties because of the mark scheme or memorandum, in other words how marks are to be allocated. Therefore, answers to multiple-choice questions on a specific topic could be easier than questions where a candidate has to construct a response.

The estimated percentages for each level of difficulty within each cognitive level are shown in the table below.

	D1	D2	D3	D4	TOTAL
C1	±5%	±10%	±15%	-	±30%
C2	±10%	±20%	±8%	±2%	±40%
C3	±15%	±9%	±3%	±3%	±30%
TOTAL	±30%	±39%	±26%	±5%	100%

3. ASSESSMENT IN PAPER 1

3.1 Software

Circular S9 of 2015 states the following: 'As from January 2016, the DBE will only use Microsoft Office to implement and assess the CAT curriculum.'

- The following three versions of MS Office will be used: MS Office 2010, MS Office 2013 and MS Office 2016.

- Should newer versions of MS Office be released, the phasing out of older versions and the implementation of newer versions will be communicated to all stakeholders by the DBE.

- An HTML editor such as Notepad++ **MUST** be used to answer the web development question in the question paper.

- **ANY HTML QUESTION ANSWERED USING A WORD PROCESSOR WILL NOT BE MARKED.**

- Refer to Annexure G in Government Gazette No. 31337 of 29 August 2008 (Regulations pertaining to the conduct, administration and management of assessment for the National Senior Certificate) pertaining to the conduct of a practical computer-based examination and the security procedures that should be in place.

3.2 Scope

TOPIC	MARKS	CONTENT/FOCUS
Word processing	**±28%**	One or more main questions containing subquestions related to the content, concepts and skills in word processing
Spreadsheets	**±28%**	One or more main questions containing subquestions related to the content, concepts and skills in spreadsheets
Databases	**±22%**	One or more main questions containing subquestions related to the content, concepts and skills in databases An input mask character sheet will be provided for use with questions on the database application.
Web Development	**±11%**	One or more main questions containing subquestions related to the content, concepts and skills in web development An information sheet with HTML tags will be provided for use with the question on web development.
General	**±11%**	Integration and application of techniques, knowledge and procedural skills that could include all of the applications studied

3.3 Content

Further clarification of content that could be tested in the final examination of Paper 1:

- Basic date and time functions as indicated on page 40 of the CAPS:
  - YEAR
  - MONTH
  - DAY
  - DAYS
  - HOUR
  - MINUTE
  - TIME
  - TODAY
  - NOW

- Forms, queries and reports as indicated on page 40 of the CAPS:
  - Candidates could be provided with multiple related tables; however, they will only be required to work with one table at a time (and will only have to use skills listed in the CAPS).

- Use of electronic forms as indicated on page 31 and page 41 of the CAPS:
  - Legacy controls should be used to answer questions regarding electronic forms.

- Referencing functions as indicated on page 36 of the CAPS:
  - Index
  - Table of Figures

- Variations of known functions on page 40 of the CAPS:
  - COUNTIFS
  - SUMIFS

- HTML:
  - Refer to Annexure A for an example of the HTML tag sheet that will be supplied with the question paper.

- Lookup and reference functions as indicated on page 40 of the CAPS:
  - VLOOKUP
  - HLOOKUP

- Additional functions:
  - SUBTOTAL
  - RANDBETWEEN

- Transfer of skills – skills learnt in one application may be tested in another application.

- A combination of more than one function may be required to solve more complex problems.

4. ASSESSMENT IN PAPER 2

4.1 Scope

TOPIC	MARKS	CONTENT/FOCUS
SECTION A		
Short Questions	**±17%**	This section will include all or some of the following: • Multiple-choice questions covering all topics • Matching columns questions covering all topics • Modified True/False questions covering all topics
SECTION B		
Systems Technologies	**±17%**	Questions relating to the content, concepts and skills in the topic as listed in the CAPS document, including (but **NOT** limited to): • Computer hardware in all its different forms and configurations • Peripheral devices, such as printers, routers, scanners • System and application software • Network hardware and software • Housekeeping and management of computing devices • Basic troubleshooting, etc. Refer to pages 19–46 of the CAPS document for a detailed list of possible topics that may be asked in this section.
Internet and Network Technologies	**±10%**	Questions relating to the content, concepts and skills in the topic as listed in the CAPS document, including (but **NOT** limited to): • What is a network and why would one want to use a network? • Types of networks • The Internet and Internet services and the World Wide

TOPIC	MARKS	CONTENT/FOCUS
		Web • Websites, web technologies and browsers • E-communications, including e-mail, instant messaging Refer to pages 19–46 of the CAPS document for a detailed list of possible topics that may be asked in this section.
Information Management	**±7%**	Questions relating to the content, concepts and skills in the topic as listed in the CAPS document, including (but **NOT** limited to): • Formulation of key questions to locate data and direct problem-solving • Choosing, locating and accessing appropriate data sources • Checking the quality and accuracy of data • Data processing • Interpretation of data and information, etc. Refer to pages 19–46 of the CAPS document for a detailed list of possible topics that may be asked in this section.
Social Implications	**±7%**	Questions relating to the content, concepts and skills in the topic as listed in the CAPS document, including (but **NOT** limited to): • The impact of ICTs on society • Legal, ethical and security issues related to the use of ICTs • Educational and ergonomic issues • Environmental issues, including green computing, etc. Refer to pages 19–46 of the CAPS document for a detailed list of possible topics that may be asked in this section.
Solution Development	**±10%**	Questions focusing on the knowledge, understanding and development of solutions using application software. These questions will essentially revolve around the theoretical aspects of the applications studied.
SECTION C		
Integrated Scenario	**±32%**	Candidates will be presented with real-life scenarios on which questions covering all topics will be examined. The questions will assess candidates' understanding of the technologies, their ability to make informed decisions ranging from choice of technology, application software to be used, networking, etc., through to the responsible use of such technologies.

NOTE:

- The content in the table above is NOT an exhaustive list of all the content – also refer to the CAPS document which contains a list of all possible content to be covered.
- Some of the topics may fall into two or more focus areas, thus topics might be examined in different sections/questions from year to year, depending on examiner discretion.
- Operational knowledge from Paper 1 in terms of understanding where, how and why various functions, techniques and concepts are applied in problem-solving contexts may also be examined in this paper. This also includes interpreting simple error messages and assessing the best options and strategies in a given situation.

4.2 Content

4.2.1 Clarification of existing content in the CAPS

The terminology highlighted in this section has appeared in previous Examination Guidelines. The level of depth of knowledge required for these terms is as indicated in terms of understanding what these terms represent and a basic understanding of their application(s) in an ICT context.

Overview of the different types of computers on page 19 of the CAPS and convergence on page 39 of the CAPS:

- **Phablet:** A smaller version of a tablet, which (over and above tablet features) also incorporates features found on a smartphone, such as voice calls and SMSs.

Examples of generic/common storage devices and media on page 20 of the CAPS:

- **Solid-state drive:** A drive that has no moving parts making it quieter and more robust. They operate much faster than traditional hard drives as they store data electronically and not magnetically as with a traditional hard drive.

Generic/Common output devices on page 20 of the CAPS:

- **3D printing/printers:** 3D printers can create three-dimensional solid objects (e.g. motor vehicle parts, human tissue replacement, jewellery, clothing) from a digital model of the item by adding successive layers of material on top of one another.

Identify ports and connectors on page 22 of the CAPS:

- **Micro-USB:** A smaller version of a USB port, usually found on portable devices such as smartphones.

Input (basic concepts, features and uses) on page 22 of the CAPS:

- **Multi-touch screen:** Feature of a screen that allows it to register more than one point being touched simultaneously.

Storage media and devices (memory cards) on page 22 of the CAPS:

- **Card reader:** A device connected to a computer that is designed to accept and read data from different types of storage media, such as SIM and SD cards and flash drives.

Web page, website, hyperlink on page 25 of the CAPS:

- **URL shortener:** This is a tool or service, such as TinyURL.com, which converts a long URL to a shorter version. This shorter version of the URL will take a user to the same web address, but is easier to remember and/or type out.

What determines the quality of monitors and printers on page 30 of the CAPS:

- **HDMI:** High-definition multimedia interface is a standard/port for connecting high-definition video devices, such as computer monitors, video projectors and digital television. HDMI carries high quality video and audio signals, and there is no need for separate audio cables as with VGA.

Wireless technology (printers) on page 30 of the CAPS and Wi-Fi hotspots, WiMAX, Bluetooth on page 35 of the CAPS:

- **NFC:** Near field communication (NFC) is a standard that allows devices such as smartphones to connect wirelessly simply by touching them together or bringing them into close proximity to, for example, exchange files by just touching two smartphones together or for sending a file from a smartphone to a printer wirelessly.

The role of ICTs in the workplace on page 30 of the CAPS and social implications on page 32 of the CAPS:

- **BYOD:** Bring your own device (BYOD) refers to a concept where employees/students are allowed to bring and use their own portable devices, such as smartphones, laptops, tablets, to work on and access the network instead of a device owned/supplied by the company/ institution.

Overview of portable and mobile Internet access (basic concepts) on page 35 of the CAPS:

- **802.11 a/b/g/n:** Refers to a set of specifications and protocols used in communication on a wireless network. The letters (a, b, g, n) simply indicate different versions of the Wi-Fi standard (each with different speeds, etc.).

- **LTE:** A standard used in wireless communication which provides for high-speed data transfer between cellular devices (such as smartphones and tablets) and ISPs. It is the next generation of cellular connectivity after 3G, sometimes also called 4G. LTE-Advanced Pro or 4.5G is the next wireless upgrade beyond LTE or 4G, which is even faster.

Management of files on page 40 of the CAPS:

- **Geo-tagging:** A process where a geographical position of where a photograph was taken is added to the metadata of a file, such as adding the latitude and longitude.

Security issues on page 42 of the CAPS:

- **Click-jacking:** Users are tricked into clicking on an item on a web page which acts as a concealed link.

How technology can benefit or harm society on page 45 of the CAPS:

- **Crowd funding:** A process where a single idea or business practice is funded by multiple small donations from volunteer contributors, usually before the business venture is started. The contributors will then receive the product when it is finally put into production. Examples include www.indiegogo.com and www.kickstarter.com.

4.2.2 Additional content

The terminology highlighted in this section has NOT appeared in previous Examination Guidelines. The level of depth of knowledge required for these terms is in terms of understanding what these terms represent and a basic understanding of their application(s) in an ICT context.

- **Big data:** Very large structured and unstructured data sets that are analysed using computers to reveal trends and associations. These present challenges, such as storage, curation, querying, visualisation.

- **Bitcoin:** This is a form of virtual, digital currency. Bitcoins can be exchanged for other currencies, products and services. They have caused concern because they are often used for payment in criminal activities such as ransomware demands. However, more and more legitimate companies are accepting them as a means of payment.

- **Digital migration:** A process in which broadcasting services using traditional analogue technology are replaced with digital technology.

- **Internet of Things (IoT):** This refers to the trend whereby all sorts of objects and devices are increasingly being connected to one another via the Internet. This can range from surveillance systems to geysers, washing machines, 'smart' motorcars and traffic lights, etc. Various sensors in the devices can produce data for all sorts of purposes, including diagnostics and running systems more efficiently.

- **Mobile or M-Learning:** A form of education and training delivered and conducted via the Internet using mobile devices, such as tablets and smartphones. It is designed to be flexible, allowing learners/workers/students access to education anywhere, anytime.

- **Ransomware:** A type of malware designed to encrypt or block access to your computer system and files until you pay a sum of money ('ransom').

- **Screen lock pattern:** A way of locking a device by setting up a pattern you must draw or trace on the screen to unlock the device.

- **Shaping (Network tuning):** A technique whereby certain network (Internet) services, e.g. e-mail, are given preference while others, such as social networking services, are given less priority, thus performance is maintained for the more critical services.

- **Throttling (Policing):** This occurs when your ISP slows down your Internet connection. This most often occurs when you have been deemed by your ISP to have downloaded excessive amounts of data. Each ISP has an acceptable use policy (AUP) which specifies how this is determined and implemented.

- **Virtual reality (VR):** This refers to using technology to create a simulation of a 3D environment that can be interacted with by a person in a seemingly real or physical way. This is achieved by using equipment, such as helmets with screens and gloves fitted with sensors. **Augmented reality** uses similar types of technology, but does not create a totally virtual environment like VR. Instead it takes the physical world and adds (augments) objects such as graphics within the real world. Both VR and augmented reality are used in areas ranging from entertainment (e.g. the augmented reality game Pokémon GO), training in aircraft simulators and medicine with surgeons being able to perform remote surgery on patients.

4.2.3 Technology/Concepts that will no longer be examined

As technology improves many technologies may become obsolete or will no longer be relevant and will therefore not be examined. In other cases the set differences between devices/ technologies may become blurred. As a result these concepts will not be examined in order to avoid confusion for the candidates, as well as during the marking process.

Concepts/Technologies that will no longer be assessed from 2017:

- CRT monitors
- Fax
- Fax modems
- FireWire
- MICR
- MySpace
- OMR
- PDA
- Second Life
- Stand-alone vs. integrated software in terms of Office Suites
- Widgets

5. CONCLUSION

This Examination Guidelines document is meant to articulate the assessment aspirations espoused in the CAPS document. It is therefore not a substitute for the CAPS document which teachers should teach to.

Qualitative curriculum coverage as enunciated in the CAPS cannot be over-emphasised.

ANNEXURE A: HTML TAG SHEET

Basic Tags	
Tag	**Description**
<body></body>	Defines the body of the web page
<body bgcolor="pink">	Sets the background colour of the web page
<body text="black">	Sets the colour of the body text
<head></head>	Contains information about the web page
<html></html>	Creates an HTML document – starts and ends a web page
<title></title>	Defines a title for the web page
 	Inserts a line break
<!-- -->	Comment
Text Tags	
Tag	**Description**
<hl></hl>	Creates the largest heading
	Creates the smallest heading
	Creates bold text
	Creates italic text
	Sets size of font, from "1" to "7"
 	Sets font colour
	Sets font type
Links Tags	
Tag	**Description**
	Creates a hyperlink
<img src="name">	Creates an image link
	Creates a target location in the document
	Links to a target location created somewhere else in the document
Formatting Tags	
Tag	**Description**
	Creates a new paragraph
	Aligns a paragraph to the "left" (default), can also be "right" or "center"
 	Inserts a line break
	Creates a numbered list
<ol type="A","a", "I","i","1">	Defines the type of numbering used
	Creates a bulleted list
<ul type="disc", "square","circle">	Defines the type of bullets used

Formatting Tags continued	
Tag	**Description**
	Inserted before each list item, and adds a number or symbol depending on the type of list selected
<img src="name">	Adds an image
<img src="name" align="left">	Aligns an image: can be "left", "right", "bottom", "top"
<img src="name">	Aligns an image in the "center", can also be "middle"
<img src="name" border="1">	Sets the size of the border around an image
<img src="name" width="200" height ="200">	Sets the height and width of an image
<img src="name" alt="alternative text">	Displays alternative text when the mouse hovers over the image or when the image is not found
	Inserts a horizontal line
<hr size="3"/>	Sets size (height) of a line
<hr width="80%"/>	Sets the width of a line, in percentage or absolute value
<hr color= "ff0000"/>	Sets the colour of the line
Table Tags	
Tag	**Description**
<table></table>	Creates a table
<tr></tr>	Creates a row in a table
<td></td>	Creates a cell in a table
<th></th>	Creates a table header (a cell with bold, centred text)
<table width="50">	Sets the width of the table
<table border="1">	Sets the width of the border around the table cells
<table cellspacing="1">	Sets the space between the table cells
<table cellpadding="1">	Sets the space between a cell border and its contents
<tr align="left">	Sets the alignment for cell(s) ("left", can also be "center" or "right")
<tr valign="top">	Sets the vertical alignment for cell(s) ("top", can also be "middle" or "bottom")
<td colspan="2">	Sets the number of columns a cell should span
<td rowspan="4">	Sets the number of rows a cell should span

ANNEXURE B: INPUT MASK CHARACTER SHEET

CHARACTER	DESCRIPTION
0	Digit (0 to 9, entry required, plus [+] and minus [–] signs not allowed)
9	Digit or space (entry not required, plus [+] and minus [–] signs not allowed)
#	Digit or space (entry not required; spaces are displayed as blanks while in Edit mode, but blanks are removed when data is saved; plus [+] and minus [–] signs allowed)
L	Letter (A to Z, entry required)
?	Letter (A to Z, entry optional)
A	Letter or digit (entry required)
a	Letter or digit (entry optional)
&	Any character or a space (entry required)
C	Any character or a space (entry optional)
. , : ; - /	Decimal placeholder and thousand, date and time separators (The actual character used depends on the settings in the **Regional Settings Properties** dialog box in the Windows Control Panel.)
<	Causes all characters to be converted to lower case
>	Causes all characters to be converted to upper case
!	Causes the input mask to display from right to left, rather than from left to right. Characters typed into the mask always fill it from left to right. You can include the exclamation point anywhere in the input mask.
\	Causes the character that follows to be displayed as the literal character (for example \A is displayed as just A)
“”	Characters enclosed in double quotation marks will be displayed literally.