SYLLABUS

INFORMATION TECHNOLOGY

CXC 30/G/SYLL 17

Effective for examinations from May–June 2020

Correspondence related to the syllabus should be addressed to:

The Pro-Registrar
Caribbean Examinations Council
Caenwood Centre
37 Arnold Road, Kingston 5, Jamaica

Telephone Number: + 1 (876) 630-5200
Facsimile Number: + 1 (876) 967-4972
E-mail Address: cxcwzo@cxc.org
Website: www.cxc.org

Contents

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Please check the website, www.cxc.org for updates on **CXC®**'s syllabuses.

Information Technology Syllabus

♦ RATIONALE

Information Technology (IT) *continues to* evolve in response to the need for more efficient techniques to manage the significantly increased volume and sophistication of the knowledge reservoir of mankind. It merges the study of Computer Science, *Information and Communications Technology (ICT)* and Office Automation. *It* involves the collection, processing, storage, *retrieval*, and dissemination of information, and impacts both work and *social* activities. *The evolution of the field of Information Technology continues at a rapid pace. New technologies are constantly emerging and existing ones become obsolete soon after they appear. The rapid advances in technology undoubtedly have a profound effect on information technology education and, as such, Information Technology curricula must be refreshed to remain relevant.*

In a world characterized by rapid technological innovations, it is imperative that Information Technology students are equipped with the requisite knowledge and skills that will enable them to function effectively both as producers and consumers of technology. It is also important to prepare students for the future by establishing foundational competencies which will enable them to be flexible to adapt to emerging technologies and new situations. To this end, the CSEC® Information Technology syllabus is designed to provide knowledge and skills in the essential Information Technology domains which include: computer fundamentals, problem-solving, networks, Web Technologies, productivity tools, computer and cybersecurity, as well as the social implications of information and communications technology. The goal is to use learner-centred and problem-based teaching, and assessment strategies to develop core competencies that will provide pathways to multiple post-secondary destinations.

Information Technology is the key to development and productivity in this modern era and as such, Information Technology education must be seen as integral to meeting the developmental needs of our region. All citizens *should* have practical exposure to the applications of Information Technology in order to *narrow* the gap between Caribbean *and developed nations.* Consequently, this programme *of study* in Information Technology *promotes the development of* computer-related skills and encourages the development of analytical and design skills which are applicable in *all subject areas, the work environment and the wider society.* The syllabus aims to *provide a blend of knowledge* and practical experience *that fosters* innovation, self-confidence, together with *critical thinking* skills that will prepare students to meet *the ICT needs of the* region *and beyond.*

The Information Technology syllabus is based on objectives, skills and content which will cultivate the attributes of the Ideal Caribbean Person as articulated by CARICOM. That is, a Caribbean person who demonstrates multiple literacies, as well as independent and critical thinking, and questions the beliefs and practices of the past and brings this to bear on the innovative application of science and technology to problem-solving. Such a person will inevitably demonstrate a high level of self-confidence and self-esteem, a positive work ethic, and display and nurture creative imagination in the economic and entrepreneurial spheres and other areas of life. Also, in keeping with the UNESCO Pillars of Learning, this course of study will contribute to the development of a person who will learn to be, learn to know, learn to do, learn to live together, and learn to transform oneself and society.

♦ AIMS

The syllabus aims to:

1. *prepare students to function effectively in a dynamic technological era;*

2. *promote the development of computer-related skills for application to real-life situations;*

3. *prepare students to use information technology responsibly;*

4. *facilitate the development and application of problem-solving and other twenty-first century skills;*

5. *provide a foundation for post-secondary education; and,*

6. *prepare students for suitable employment.*

♦ ORGANISATION OF THE SYLLABUS

The syllabus is organised under eight main sections.

1. Computer Fundamentals and Information Processing:

    (a) Computer Fundamentals.

    (b) Information Processing Fundamentals.

2. *Computer Networks and Web Technologies.*

3. *Social and Economic Impact of Information and Communications Technology:*

    (a) *Implications of Misuse and Cybersecurity.*

    (b) *Impact on Jobs and Education.*

4. *Word-Processing and Web Page Design:*

    (a) *Word-Processing.*

    (b) *Web Page Design.*

5. *Spreadsheets.*

6. *Database Management.*

7. *Problem-Solving and Program Design.*

8. *Program Implementation.*

♦ SUGGESTED TIMETABLE ALLOCATION

It is estimated that the syllabus can be covered in approximately 160 hours or four periods per week during the fourth and fifth years in the secondary school. A suggested time allocation (in hours) is shown below for each section. The laboratory hours indicated are calculated on a per student basis.

	Section	Class	Lab	Field	Total
1.	*Computer Fundamentals and Information Processing*	*30*	*4*		*34*
2.	*Computer Networks and Web Technologies*	*11*	*-*	*2*	*13*
3.	*Social and Economic Impact of Information and Communications Technology*	*12*	*-*	*-*	*12*
4.	*Word-Processing and Web Page Design*	*5*	*15*	*-*	*20*
5.	*Spreadsheets*	*5*	*10*	*-*	*15*
6.	*Database Management*	*5*	*13*	*-*	*18*
7.	*Problem-Solving and Program Design*	*20*	*-*	*-*	*20*
8.	*Program Implementation*	*15*	*20*	*-*	*35*

Allied Subjects

Although no subjects are being specified as either prerequisites or co-requisites to Information Technology, it is expected that students would have pursued a course in Mathematics up to Grade 9 (Form 3).

♦ FORMAT OF THE EXAMINATIONS

Paper 01
(1 hour 15 minutes)

Sixty multiple-choice items: 35 items from Sections 1, 2 and 3; 15 items from Sections 4, 5 and 6; and 10 from Sections 7 and 8.

Paper 02
(2 hours)

Four compulsory structured questions drawn from all areas of the syllabus. Marks will be allocated as follows: 35 marks toward the Theory profile, 30 marks toward the Productivity Tools profile and 25 marks toward the Problem-Solving and Programming profile. Knowledge of a specific programming language will not be tested.

Paper 032
Assessment for Private Candidates only
(2 hours)

Alternate to the School-Based Assessment for private candidates. This paper will examine similar skills as those tested in Paper 031. The focus, therefore, will be on Productivity Tools and Problem-Solving and Programming. This paper will be a practical paper,

consisting of five questions: four on Productivity Tools, worth 35 marks, and one on Problem-Solving worth 15 marks.

School-Based Assessment

Paper 031

The SBA component will comprise a practical project testing Section 4, Word-Processing *and Web Page Design*; Section 5, Spreadsheets; Section 6, Database Management; Section 7, Problem-Solving and Program Design; and Section 8, Program Implementation.

*The Project will carry 50 marks which will account for 25 per cent of the final grade. This 50 marks will be distributed as follows: 10 for Word-Processing; 5 for Web Page Design; 10 for Spreadsheets; 10 for Database Management; and 15 for Problem-Solving. The project will be marked by the teacher in accordance with **CXC®** guidelines and the marks should be submitted to **CXC®**. The assignment should be administered as specified in the instructions contained in the Guidelines to the Conduct of the SBA, on pages 31–42.*

♦ CERTIFICATION

*The subject will be examined for certification at the General Proficiency. The School-Based Assessment component for this syllabus is aligned to selected units within the regional qualification of the Caribbean Vocational Qualification (CVQ). Through this integration, once all requirements for issuing the CVQ are met, every student with acceptable grades will receive a Statement of Competence to recognize their competencies in selected units from the Level 1 Caribbean Vocational Qualification (CVQ) in Data Operations – Level 1 (**CCITI10106**). The decisions to award competencies will be based on the quality and relevance of the pieces of evidence presented for the occupational area.*

In addition to an overall grade, there will be a profile report that reflects the performance of each candidate under the following headings.

♦ DEFINITION OF PROFILE DIMENSIONS

Profile Dimensions

Theory	The ability to apply fundamental concepts and skills to Information Technology.
Productivity Tools	*The ability to apply standard features in the following areas:*

(a)   word processor in the preparation of documents, as well as the candidate's ability to use web page design applications;

(b)   spreadsheet program in solving problems and presenting data; and,

| | (c) | database management program in storing and retrieving data. |

| Problem-Solving and Programming | The ability to use analytical skills in the development of algorithms, expressed as flowcharts or pseudo code, that can then be implemented as applications or computer programs. |

MARK AND WEIGHT ALLOCATION FOR PROFILE DIMENSIONS

Paper/Profiles	Theory	Productivity Tools	Problem-Solving and Programming	Paper Total	% Weighting Of Papers
Paper 01	35	15	10	60	30
Paper 02	35	30	25	90	45
Paper 03	-	35	15	50	25
Profile Totals	70	85	50	200	
% Weighting Profiles	35	40	25		100

♦ HARDWARE AND SOFTWARE REQUIREMENTS

For Schools:

1. It is the responsibility of schools presenting candidates for the examinations to ensure that the required hardware and software are in place to achieve the syllabus objectives.

2. Candidates are advised to try out solutions to a variety of different problems on a computer using a programming language of their choice; no particular programming language will be assumed in this syllabus.

3. From the list provided below, teachers may select appropriate software for the Word-Processing, Spreadsheets, Database Management, *and Web Page Design* components of the syllabus.

RECOMMENDED SOFTWARE

Word-Processing	Spreadsheets	Database Management	*Web Page Design*
1. Microsoft Word	1. Microsoft Excel	*1. Microsoft Access* *2. OpenOffice Base*	*1. Microsoft Word*
2. Google Docs	*2. Google Sheets*		*2. Free online web services such as www.wix.com, www.webnode.com or www.weebly.com*
3. Google Forms	*4. OpenOffice Calc*		*3. Google Sites*
4. OpenOffice Writer			

♦ NOTES TO TEACHERS

1. Students should be aware of the input/process/storage/output cycle as it pertains to hardware and software components in Section 1.

2. *Section 7 should be taught before Section 8. Students should learn how to develop algorithms before they are introduced to writing code in a programming language.*

3. In Section 7, the focus should be on the development of solutions in the form of algorithms (pseudocode/flowchart). The problem-solving skills acquired in this section serve as a foundation for programming in Section 8.

4. *In Section 8, students are required to translate a suitable selection of the algorithms developed in Section 7 into an end-user application using one of the programming tools recommended by the centre. Use simple problems, for example, finding the average of a set of integers, or calculating tax payable, to illustrate how to develop simple programs.*

5. *In Section 8, laboratory sessions should be used to:*

    (a)   familiarise the student with the features of the recommended translator;
    (b)   identify and correct syntax errors;
    (c)   identify and correct logic errors; and,
    (d)   execute program and display results.

    It is recommended that students develop the algorithms on paper before converting into source code. This allows for more efficient utilization of computer time.

6. *While* it is expected that students *will* gain skills in the use of productivity tools through practice on specific packages, teachers should ensure that students have an appreciation of the generic operations of each of the productivity tools so that skills are transferable to other packages.

7. Although not a requirement of the course, it may be useful to apprise students of the history of computers.

8. A glossary has been provided to facilitate a uniform*ed* interpretation of the terminology used in the syllabus. Teachers are advised to make use of this glossary and also the list

of recommended texts. However, the reading list provided is not exhaustive and additional references should be consulted.

♦ REGULATIONS FOR RESIT CANDIDATES

*For **CSEC®** candidates, SBA scores can be carried forward only ONCE and only during the year immediately following the first sitting. In order to assist candidates in making decisions about whether or not to reuse a moderated SBA score, the Council will continue to indicate on the preliminary results if a candidate's moderated SBA score is less than 50 per cent in a particular subject. Candidates re-using SBA scores should register as "Re-sit candidates" and must provide the previous candidate number when registering. These candidates must rewrite Papers 01 and 02 of the examination for the year in which they re-register.*

Resit candidates may enter through schools, recognized educational institutions or the Local Registrar's Office.

♦ REGULATIONS FOR PRIVATE CANDIDATES

1. *Private candidates must be entered for examination through the Local Registrar or approved private institutions in their respective territories and will be required to sit Papers 01, 02, and EITHER Paper 031 OR Paper 032.*

2. *Paper 032 is a practical examination designed for candidates whose work cannot be monitored by tutors in recognized educational and approved private institutions. The Paper will be of 2 hours' duration and will consist of five questions. Questions will test the Productivity Tools and Problem-Solving and Programming profiles.*

3. *Candidates entered for the examination through private institutions and who opt to complete the SBA project must note the following:*

    (a) *Candidates' work must be monitored by tutors in the institution and feedback given before the final assessment of that component. Tutors must also monitor candidates' project to determine the veracity of work submitted. Tutors should not accept projects which were not monitored during development. The marks recorded in the four components will be collated to form the final SBA mark for submission by 30 April, in the year of the examination.*

    (b) *Marks must be submitted to the Caribbean Examinations Council on the School-Based Assessment forms provided online. The forms should be submitted electronically via the SBA data capture module on the Online Registration System (ORS) on the Council's website. Candidates who do not fulfil the requirements for the School-Based Assessment will be reported as "ungraded".*

    (c) *Candidates as well as tutors must retain a copy of the completed component as part of their portfolio.*

♦ SECTION 1: COMPUTER FUNDAMENTALS AND INFORMATION PROCESSING

GENERAL OBJECTIVES

On completion of this Section, students should:

1. develop an understanding of the fundamental hardware and software *components and the interrelationship among them;*

2. develop expertise in *evaluating computer systems; and,*

3. *develop an understanding of basic information processing principles.*

SPECIFIC OBJECTIVES	CONTENT
COMPUTER FUNDAMENTALS	
Students should be able to:	
1. explain the concept of Information Technology;	Definition and scope of Information Technology.
2. distinguish among the major types of computer systems *in terms of processing speed, storage and portability;*	Major types: (a) *Super Computers (for example, Cray).* (b) Mainframes (for example, IBM zEnterprise System). (c) Desktop systems. (d) Mobile devices *(for example, laptops, notebooks, netbooks, smartphones, tablets and game consoles).* (e) Embedded devices *(for example, special-purpose systems such as controllers in microwaves, car ignition systems, answering machines).*
3. *explain the functions of the major hardware components of a computer system;*	*Major components: input, central processing unit, primary memory (RAM and ROM), secondary storage, output.* (a) *Secondary storage devices: hard disk, magnetic tape, flash drive, memory card, and optical disks (CD, DVD and Blu-Ray).* (b) *Units of storage: bits, bytes, kilobytes, megabytes, gigabytes, terabytes.*

SPECIFIC OBJECTIVES   **CONTENT**

COMPUTER FUNDAMENTALS (cont'd)

Students should be able to:

4. *explain how the major hardware components of a computer system interrelate;*

Input processing output storage (IPOS) cycle.

5. *evaluate the relative merits of cloud storage and local storage;*

Definition of cloud and local storage. Assessment criteria: capacity, cost, accessibility; security issues.

6. *select appropriate input/output devices to meet the needs of specified applications;*

Associate the following devices with suitable applications:

(a) *Input:* Optical mark reader (OMR), character readers (OCR, MICR), mouse, joystick, *bar code reader, document scanner*, light-pen, touch terminals, voice response unit, *Touch Screens (tablets, point of sale, ATM),* keyboard, *digital camera, biometric systems, sensors, remote control, sound capture, pointing devices, webcam.*

(b) *Visual output: Printers (laser, inkjet, dot matrix, thermal, plotters, 3D Printers), microfilm.*

(c) *Audible output: speakers, headphones, earphones*.

7. *explain the role of the different types of software in computer operation;*

System Software: Operating System, Utilities.

Application software: general-purpose and special-purpose; integrated package; source: off the shelf, custom-written, and customized.

8. *discuss the relative merits of the various types of user interface;*

Hardware: touch screens, specialized keyboards.

Software: command line, menu-driven, graphical user, touch.

SPECIFIC OBJECTIVES	CONTENT
COMPUTER FUNDAMENTALS (cont'd)	
Students should be able to:	
9. *evaluate the suitability of a given computer system for a specific purpose;*	*Basic knowledge of system specification needed for purposes such as: to run a video game, web browsing, graphic design, video editing, and desktop publishing.*
	Criteria:
	(a) *Processing speed (CPU type and speed);*
	(b) *Memory (RAM);*
	(c) *Secondary storage (capacity and speed);*
	(d) *Types of software; and,*
	(e) *Input/Output devices.*
10. *troubleshoot basic computer hardware problems;*	*Cable problems (for example, loose cables).*
	Monitor problems (for example, improperly adjusted monitor controls).
	Printer problems (for example, changing printer cartridges).
	Battery problems (for example, loose or dead battery).
INFORMATION PROCESSING FUNDAMENTALS	
Students should be able to:	
11. *distinguish between data and information;*	Data as raw unprocessed facts; information as processed data.
	Sources of data and information (people, places and things).
	Document types: turnaround document, human-readable and machine-readable forms; hard copy, and soft copy.

SPECIFIC OBJECTIVES	CONTENT

INFORMATION PROCESSING FUNDAMENTALS (cont'd)

Students should be able to:

12.	*evaluate the reliability of information obtained from online sources;*	*Evaluation of information retrieved electronically for authenticity, currency, relevance, and bias.*
13.	*differentiate between* validation and verification of data;	Difference between validation and verification.
14.	identify appropriate validation and verification checks given a particular scenario; and,	*Methods of validation: range check, reasonableness checks, data type checks, consistency checks, presence, format and length.*
		Methods of verification: double entry and proofreading (to identify and correct typographical and transpositional errors).
15.	*select appropriate file organization for particular application.*	*File access methods: sequential, serial, direct and random.*
		Application areas: archiving, payroll file, real time systems.

Suggested Teaching and Learning Activities

To facilitate students' attainment of the objectives of this Section, teachers/facilitators are encouraged to engage students in the teaching and learning activities below.

1.   *Organize students in groups to conduct a research on the major hardware components of a computer system. They should use a "show and tell" approach to present findings.*

2.   *Arrange visits to local Computer Technology businesses to expose students to different system specifications needed, for example, running a video game, web browsing, graphic design, video editing, and desktop publishing.*

3.   *Teachers should arrange for practical sessions in a computer laboratory. After demonstrations by the teacher and/or professional, students should be arranged in pairs to carry out activities such as attaching a monitor, keyboard, and mouse to the computer's system unit, fixing loose cables, and changing printer cartridges.*

4.   *Use a video tutorial to illustrate the various types of user interfaces. Allow students to identify merits of using each interface.*

5. *Organize students in groups and assign the task of collecting samples of the different categories of input and output devices. They should then set up an exhibition area and be encouraged to invite the school population to visit booths.*

6. *Invite local software developers/software engineers/programmers to do guest lectures in which they explain the types of software and their role in computer operation.*

7. *Allow students to mount a display on the major types of computers systems, using pictures and other relevant information.*

8. *Encourage students to create a scrapbook with samples of information, data, sources of data and information, as well as different document types.*

9. *Arrange visits to local archives, libraries and media houses to expose the students to the work of appropriate file organization and access.*

10. *Engage students in activities during a class session to write scenarios for their colleagues to identify the appropriate data verification and validation checks that should be applied.*

♦ SECTION 2: COMPUTER NETWORKS AND WEB TECHNOLOGIES

GENERAL OBJECTIVES

On completion of this Section, students should *develop an awareness of*:

1. *basic networking concepts, including mobile networks; and,*

2. *Internet and Web Technology concepts.*

SPECIFIC OBJECTIVES	**CONTENT**
Students should be able to:	
1. distinguish among types of networks;	*Types of networks (local area network, metropolitan area network, wide area network, mobile network).*
	(a) *Concept of mobile network as radio-based common carrier.*
	(b) *Overview of mobile networks: from 2G to current. (Knowledge of the inner workings of mobile systems is NOT required)*
	Wireless network technologies (for example, Bluetooth, Wi-Fi, hotspot).
	Level of privacy (intranet, extranet, Internet).
2. explain the functions of the basic components of a network;	Basic components and functions:
	(a) Transmission media:
	(i) Wired: twisted pair, coaxial, fibre; and,
	(ii) Wireless: infrared, microwave, satellite.
	(b) Switch, router, modem.
	(c) Network interface card/network adapter.

SPECIFIC OBJECTIVES	**CONTENT**
Students should be able to:	
3. assess the importance of mobile communication technologies as a component of modern communication networks; and,	*Suitability of mobile networks to various applications (for example, education, commerce, and journalism).*
4. *explain the interrelationship among key Web technology concepts.*	*World Wide Web.*
	Hypertext Markup Language.
	Hypertext Transfer Protocol.
	Hyperlinks.
	Web Server.
	Web Page.
	File Transfer Protocol.
	Web Browser.
	Uniform Resource Locator.
	Upload and download.

Suggested Teaching and Learning Activities

To facilitate students' attainment of the objectives of this Section, teachers/facilitators are encouraged to engage students in the teaching and learning activities below.

1. *Engage students in a debate on the importance of mobile communication technologies to our daily lives, for example, the pros and cons of mobile technology in the fields of education, commerce, and journalism.*

2. *Engage students in a matching activity where they match the functions of the basic components of a network.*

3. *Engage students in role play activities where they illustrate how the different networks operate.*

4. *Invite someone with expertise in computer networks and web technologies to address the class and explain some of the concepts.*

♦ SECTION 3: SOCIAL AND ECONOMIC IMPACT OF INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

GENERAL OBJECTIVES

On completion of this Section, students should be able to:

1. develop an understanding of the various elements of computer *security,* and data misuse *and the impact on individuals and organizations*;

2. maintain safe and secure computing environments; and,

3. assess the impact of *technological advancements* on different fields, disciplines *and* jobs.

SPECIFIC OBJECTIVES	CONTENT
IMPLICATIONS OF MISUSE AND CYBERSECURITY	
Students should be able to:	
1. outline the concepts of computer *security, cybersecurity and computer misuse;*	*Computer security and* cybersecurity as related to the assessment and minimization of risk. – Elements: vulnerability, threat, attack, countermeasure. Computer misuse by individuals and *groups/*organizations.
2. assess the *potential* impact of computer systems misuse based on the main *entities* impacted;	Misuse: (a) Cyberbullying, copyright infringement, data theft, denial of service attacks, transmission of viruses *and malware*, identity theft, online publication of obscene materials, phishing attacks, software and music piracy, financial abuses, violation of privacy, propaganda, electronic eavesdropping, industrial espionage; and, (b) Entity impacted: *individual, organization, government.*

SPECIFIC OBJECTIVES	CONTENT

IMPLICATIONS OF MISUSE AND CYBERSECURITY (cont'd)

Students should be able to:

3.	describe suitable countermeasures to mitigate effects of identified threats;	*Physical measures*: backup and recovery procedures; hardware firewall, intrusion detection systems, *biometrics*.

Software measures: effective passwords and authentication systems, encryption of data, firewall, *biometrics, antivirus and malware detection*.

Personal Security practices.

Some practices include:

- verifying authenticity of email from companies or individuals, assessing website URLs for authenticity, limiting access to open Wi-Fi networks, securing mobile devices, *protection* in an online environment *(for example, social media)*.

IMPACT ON JOB SKILLS AND CAREERS

Students should be able to:

4.	*assess the effect of automation on job security;*	*Job loss vs productivity gains in skilled and unskilled job categories.*
5.	*describe the roles of various personnel in computer-related professions; and,*	*Network Engineer, Computer Programmer, Computer Support Specialist, Computer Systems Analyst, Administrators (Network, Systems and Database), Software Developer, Web Developer, Social Media Specialist.*

SPECIFIC OBJECTIVES

CONTENT

IMPACT ON JOB SKILLS AND CAREERS (cont'd)

Students should be able to:

6. *assess the impact of information and communications technology on select fields.*

Economic implications of ICT on Education, Medicine, Business, Law Enforcement and Recreation.

For example:

(a) *Impact on Education in terms of:*

access to information, reach (distance teaching), collaborative teaching and learning, plagiarism; online tutoring.

(b) *Impact on Medicine in terms of:*

access to information (for both medical personnel and patients), telemedicine, eHealth (online access to health services), implications for the quality of healthcare, increase in self-diagnosis, easy access to medical expertise in distant location (for example, teleradiology).

(c) *Impact on Business in terms of:*
E-commerce, Electronic Point of Sale (EPOS), telecommuting Email.

(d) *Impact on Law Enforcement in terms of:*
E-surveillance, finger printing, Biometrics.

(e) *Impact on Recreation in terms of:*
Music and gaming.

Suggested Teaching and Learning Activities

To facilitate students' attainment of the objectives of this Section, teachers/facilitators are encouraged to engage students in the teaching and learning activities below.

1. *Using a screenshot of a student's offensive comment about a teacher/peer on social media as stimulus, engage students in a discussion on cyberbullying.*

2. *Allow students to observe short clips about various forms of computer systems misuse (for example, hacking and identity theft) then engage in discussions on cybersecurity.*

3. *Encourage students to write a report to be placed on the school's notice board to describe the threats associated with each specific vulnerability discussed in class.*

4. *Have students classify countermeasures into appropriate categories: physical or software related. Have students derive definitions of physical and software counter measures, based on classifications.*

5. *Engage students in a poster-making competition in which they illustrate good personal security practices.*

6. *Engage students in a web quest where they explore different scenarios that will culminate in obtaining authentic and reliable online sources.*

7. *Engage students in a debate where they explore the implications of companies utilizing automated kiosks to transact business. Have students discuss the effects of job loss versus productivity gained in skilled and unskilled categories.*

8. *Engage students in a project where they visit/research various businesses to determine the extent to which technology is being used in different positions.*

9. *Have students conduct research on cybersecurity and then present their information in a panel discussion format. (Students should be able to pose questions to the panel members).*

♦ *SECTION 4: WORD-PROCESSING AND WEB PAGE DESIGN*

GENERAL OBJECTIVES

On completion of this Section, students should:

1.   have hands-on experience in the use of Word-Processing and Web Page Design in the development of computer-generated documents; and,

2.   be able to express their aptitude and creativity in design.

SPECIFIC OBJECTIVES   **CONTENT**

WORD-PROCESSING

Students should be able to:

1.	*create a document using content from a range of sources;*	*Importing text (combining documents).*
		Typewritten text, images and other objects.
2.	*use appropriate document formatting features;*	*Formatting features:* font types and sizes, *colour,* underline, bold, italics, superscript and subscript, *tab stops, bullets and numbering, line spacing, justification (left, right, centre, full), highlight, uppercase, word wrap, page size, margins, page and section breaks, page numbers,* headers, footers, footnotes and endnotes.
3.	*use appropriate editing features to structure and organize a document;*	*Drag and drop editing: perform block operations on selected areas of text within a document.*
		Use search and replace functions appropriately to edit a document.
		Use of tables, table styles, shading, borders, row and column insertion, split cells, split tables, text direction and cell margins, cell size.
		Use of columns (one, two, three, left and right columns, column breaks).

SPECIFIC OBJECTIVES	CONTENT
WORD-PROCESSING (cont'd)	
Students should be able to:	
4. use the review *feature of a word processor to enhance document readiness;*	*Spell and grammar check, thesaurus, word count, language setting, comments, and track changes.*
5. appropriately use features that allow the protection of a document;	Automatic save and backup copy, edit restrictions – password protection.
6. generate table of contents for a document;	*Auto table of content.*
7. use mail merge feature in the preparation of a document for a variety of situations;	Creation of primary documents and data files in mail merge application. Field names.
8. create a fillable electronic form for online use;	*Use of content controls, such as check boxes, text boxes, date picker, drop-down lists, and command buttons.*

WEB PAGE DESIGN

This section provides students with hands-on experience in the use of web design *tools* to create *a simple website.*

Students should be able to:

9. plan *a* website *structure and organization of page;*	Reasons for the website. The intended audience. Number of web pages desired *(no more than 3 pages).* Content of each page. Layout of the web page.
10. create simple *web pages using a variety of design features;* *(The use of HTML coding is not required.)*	Choosing an appropriate design for a page. Inserting and deleting text and graphics. Wrap text with image. Create *home page with hyperlinks.*

SPECIFIC OBJECTIVES	CONTENT

WEB PAGE DESIGN (cont'd)

Students should be able to:

11.	*insert* hyperlinks *within different locations of a typical web page*; and,	Link to another web page.
		Link to a location within the web page.
		Link to an email address.
		Link to user-created files.
12.	*evaluate* a website *for accuracy, user friendliness and effective display.*	*Considerations for publishing a website:*
		Verify that all the hyperlinks work correctly.
		Use a test audience.
		Verify that all content is up-to-date.

Suggested Teaching and Learning Activities

To facilitate students' attainment of the objectives of this Section, teachers/facilitators are encouraged to engage students in the teaching and learning activities below.

1. *Have students compare and contrast different types of word processors.*

2. *Encourage students to create newsletters/brochures/business cards/advertisements for Clubs and Departments within their school.*

3. *Arrange for students to perform the duties of the School Secretary for the Week, for example, students should prepare: notices for parent conferences, gate/corridor passes, and letters seeking sponsorship for a school activity.*

4. *Organize students in small groups to develop and create club or school web pages using a word processor or free online web services. Investors and/or Stakeholders should be invited to critique as students give their presentations.*

5. *Demonstrate how to add the Developer tab in different productivity tools to access Visual Basic for Applications (VBA) (for example, Microsoft Excel or Word).*

6. *Share examples of fillable forms where users order items online.*

♦ SECTION 5: SPREADSHEETS

GENERAL OBJECTIVE

On completion of this Section, students should develop expertise in the use of a spreadsheet package in the development of computer applications.

SPECIFIC OBJECTIVES	CONTENT
Students should be able to:	
1. explain the purpose of a spreadsheet;	*Purpose of a spreadsheet: a spreadsheet is a table consisting of cells (columns, row locations) that hold accounting or financial data and simulates the traditional spreadsheet. It captures displays and manipulates data.*
2. use appropriate terminologies and notions commonly associated with spreadsheets;	Common features: workbook, worksheet, column, row, *cell (cell address, range, label, value), formula, function.*
3. *use* basic pre-defined systems functions;	Including sum, average, date, max, min, count, counta, countif, vlookup, pmt, *if*.
4. create advanced arithmetic formulae;	Formulae including addition, subtraction, multiplication, division, and use of brackets.
5. replicate (copy) formulae into other cells;	Relative addressing, absolute addressing, *naming of ranges*.
	Effect of move, copy, delete operations on formulae.
6. manipulate columns and rows;	*Insert, delete and modify* columns and rows.
7. manipulate data in a spreadsheet;	*Numeric Data formatting (currency, accounting, percentage, comma, decimal places).*
	Sorting data (*primary field, secondary field*, ascending vs descending order).
	Filtering data (*multiple criteria*, complex criterion).
	Pivot Table (create one and two dimensional pivot tables, create frequency distribution from data and create pivot chart)

SECTION 5: SPREADSHEETS (cont'd)

SPECIFIC OBJECTIVES	CONTENT
Students should be able to:	
8. perform charting operations; and,	Select appropriate chart *types*: Column charts, Bar charts, line graphs, pie charts.
	Labelling charts: graph titles, labels on axes, *data labels*.
9. Manipulate *one or more* worksheets.	Use of *one or* more worksheets to solve problems involving some of *or* all of the functions and operations listed above.
	Linking of two or more worksheets to solve problems.

Suggested Teaching and Learning Activities

To facilitate students' attainment of the objectives of this Section, teachers/facilitators are encouraged to engage students in the teaching and learning activities below.

1. *Teachers should engage students in using feedback on class activities towards completing their SBA.*

2. *Encourage students to complete exercises that use functions and formulas to effect a more efficient and effective solution.*

3. *Demonstrate examples of locating text and data on a spreadsheet so that data is not lost if rows or columns are inserted or deleted.*

4. *Encourage students to practise pasting versus moving various types of charts to a new sheet; inserting titles and axes labels. Students should also practise pasting charts to a word-processed document and adjusting the chart on the page.*

5. *Encourage students to practise entering test data for their programs to see the results and reinforce these concepts from Sections 7 and 8.*

♦ SECTION 6: DATABASE MANAGEMENT

GENERAL OBJECTIVES

On completion of this Section, students should develop expertise in the design of a database management system in the development of computer applications.

SPECIFIC OBJECTIVES	CONTENT
Students should be able to:	
1. explain the concept of a database;	*Definition of database:*
	(a) *repository of information; and,*
	(b) *collection of tables that are related to each other.*
	Purpose of database.
2. use terminology commonly associated with a database;	Database terminology: table, row (record), column (field), primary key, secondary key, candidate key, foreign key.
	Data types: *numeric; text; logical; date /time; currency.*
3. create a database; *and,*	Table structure with at least three data types and populated with at least 25 records.
	Modify a table structure: adding new fields, deleting fields, changing field definitions.
	Establish primary keys.
	Establish relationships: *show the joins between tables (one-to-one and one-to-many).*
4. manipulate data in a database.	(a) *Forms:*
	(i) *Use of form wizard only;*
	(ii) *select suitable fields; and,*
	(iii) *use of sub-form.*
	(b) *Queries:*
	(i) *more than one criterion;*
	(ii) *use of select;*
	(iii) *use of calculated field; and,*
	(iv) *two or more fields involving the use of relational and logical operators.*

SPECIFIC OBJECTIVES   **CONTENT**

Students should be able to:

                                    (c)   *Reports:*

                                            (i)   *use of report wizard;*
                                            (ii)   *use of sorting, grouping, statistical and summary features, for example, count, sum, and average;*
                                            (iii) *report generated to screen, printer and file; and,*
                                            (iv) *renaming of report title.*

Suggested Teaching and Learning Activities

To facilitate students' attainment of the objectives of this Section, teachers/facilitators are encouraged to engage students in the teaching and learning activities below.

1.   *Highlight various paper-based databases of which students may be aware and discuss advantages of digitizing these paper-based records. From the discussion, have students generate definitions of a database and terminologies associated with a database.*

2.   *Engage students in exercises where they create database tables and practise changing the general properties of database tables.*

3.   *Engage students in activities where they practise manipulating table-editing features such as sorting, inserting and deleting records and fields.*

4.   *Engage students in activities where they use given criteria to create simple queries that will pull specific records from a table or tables.*

5.   *Engage students in activities where they create presentable reports based on tables and/or queries that can be distributed. Students should also practise generating additional report details such as summary options.*

♦ SECTION 7: PROBLEM-SOLVING AND PROGRAM DESIGN

GENERAL OBJECTIVES

On completion of this Section, students should:

1.   develop the cognitive skills to solve problems; and,

2.   *develop competence in* applying a structured approach to solving problems on the computer.

SPECIFIC OBJECTIVES	CONTENT
Students should be able to:	
1. outline the steps in problem-solving;	*Steps in problem-solving:* (a) define the problem; (b) propose and evaluate solutions; (c) determine the most efficient solution; (d) develop the algorithm; and, (e) test and validate the solution.
2. use the divide-and-conquer approach to decompose large everyday problems into smaller tasks;	*Basic treatment of the structured approach for solving complex problems.* **Note:** *It is not necessary to give a detailed treatment of the approach. Simple illustrations can be provided to help students recognize that most problems involve multiple tasks and that they should understand how to approach such problems in a structured manner.*
3. define a problem by decomposing it into its significant components;	The components are: input; process; and output. A defining diagram *(IPO Chart)* may be used to delineate the components.
4. distinguish between variables and constants;	Variables as an area of storage whose value can change during processing; the value of a constant never changes. Data types: integers, floating point (real), characters, *Boolean, string*.

SPECIFIC OBJECTIVES	CONTENT
Students should be able to:	
5. explain the concept of algorithms;	Definition of algorithms. Characteristics: finite number of steps, precise, unambiguous, flow of control from one process to another, terminate.
6. represent algorithms in the form of *flowchart and pseudocode;* and,	Use of flowchart symbols: input/output, process, decision, directional arrows, start/stop. Pseudocode – Use of read, input, store, write, *print,* output, display, *conditional branching (if-then, if-then-else, nested conditions); loops (for, while, repeat).* Use of relational operators: <, >, =, <=, > =,< >. Logical operators: AND, OR, NOT*; use of truth tables.* Arithmetic operators: +, −, *, /, *MOD, DIV*.
7. test algorithms for correctness.	*Desk checks/dry run:* construction and use of trace tables to verify results. Trace tables consist of variable names (identifiers) as column headings and values in the cells, one row for each pass.

Suggested Teaching and Learning Activities

To facilitate students' attainment of the objectives of this Section, teachers/facilitators are encouraged to engage students in the teaching and learning activities below.

1.   *Provide students with simple everyday scenarios which would allow them to practise the steps in problem-solving and logical thinking. Examples of scenarios include giving directions to a particular location; or determining which mode of transportation (for example, airplane, bicycle, vehicle, walking) is best suited for travelling to a specific location based on weather conditions; or determining which of three groups of **CSEC®** subjects (for example, languages, sciences, arts) should be chosen given that a favourite subject is included in two of the groups.*

SECTION 7: PROBLEM-SOLVING AND PROGRAM DESIGN (cont'd)

2. *Illustrate using everyday problems, such as finding the exit within a hotel or preparing a three-course meal.*

   (a) *divide the problem into a number of sub-problems;*

   (b) *solve the sub-problems individually; and,*

   (c) *combine the solutions to the sub-problems to generate the solution for the original problem.*

3. *Present simple scenarios to help students appreciate the difference between variables and constants by using everyday values such as the percentage of road tax, amount of school fees, cost of bus tickets, cost of today's lunch, or time taken to walk from one class to another.*

4. *Present students with visuals to encourage them to identify flowchart symbols (for example, rectangular symbol to represent a process). Teachers can also use exercises to match pseudocode statements with select symbols (for example, start of algorithm (start/stop symbol), input (read/write symbol), and a condition (decision symbol).*

5. *Engage students in an activity to help them identify relational, logical and arithmetic operators and how a decision is transformed into a flowchart symbol or a pseudocode statement using suitable operators.*

6. *Encourage students to practise drawing flowcharts and producing accompanying pseudocode. They should then use pseudocode to draw the flowchart as practice towards their SBA assignment.*

♦ SECTION 8: PROGRAM IMPLEMENTATION

GENERAL OBJECTIVES

On completion of this Section, students should:

1.   know how to translate an algorithm into a high-level program; and,

2.   understand how to employ techniques to successfully execute a program.

SPECIFIC OBJECTIVES	CONTENT
Students should be able to:	
1. distinguish between low-level and high-level programming languages;	Low-level language (Machine or Assembly). High-level language (*For example,* Visual Basic, Pascal, C).
2. describe the sequence of steps in implementing a program;	*Steps in implementing a program:* (a) create source code; (b) *translate and/or link (on some systems this step is transparent to users);* (c) execute/run program; and, (d) *maintain program.*
3. perform checks and tests on programs to verify correctness;	*Errors: syntax, logic, runtime.* *Testing (test data).* *Debugging techniques.*
4. declare variables and constants using elementary data types;	Data types: integer, real/*double/float*, *character*, string *and Boolean/logical.*
5. translate algorithmic statements into high-level language syntax; and,	Assignment statements; input/output operations using standard input/output (reading data entered via keyboard, displaying data on monitor). *Syntax for arithmetic, logic and relational operators.* Syntax for conditional branching (for example, if-then, if-then-else, *nested if-then-else or case*). Syntax for Iteration (Loops): for, while, repeat.

SPECIFIC OBJECTIVES	CONTENT
Students should be able to:	
6. effectively document programs.	Importance of documentation.
	Features of internal documentation (use of mnemonic, variable names, use of comments, indentation, effective use of white space).
	Features of external documentation (user manual).

Suggested Teaching and Learning Activities

To facilitate students' attainment of the objectives of this Section, teachers/facilitators are encouraged to engage students in the teaching and learning activities below.

1.   *Provide students with various examples of codes that represent high-level and low-level programming languages.*

2.   *Use programming examples to demonstrate to students the effect of not declaring variables, constants, or arrays, and the advantage of initializing them to avoid processing erroneous data.*

3.   *Provide opportunities for students to practise identifying test data for sample programs to understand the use of appropriate data (for example, negative, positive, or decimal values, text) for declared variables and the types of errors produced as a result of incorrect input.*

4.   *Encourage students to use the selected programming language to practise writing code for simple applications based on flowcharts and pseudocode as practice towards their SBA assignment.*

5.   *Engage students in activities where programming language code of declarations, input/output and assignment statements, conditional branching and loops are used to produce working programs.*

♦ GUIDELINES FOR THE CONDUCT OF THE SCHOOL-BASED ASSESSMENT

School-Based Assessment is an integral part of student assessment in the course covered by this syllabus. It is intended to assist students in acquiring and using certain knowledge, skills and attitudes that are associated with the subject. The activities for the SBA are linked to the syllabus and are part of the learning activities to enable the student to achieve the objectives of the syllabus. *Students are encouraged to work in groups.*

School-Based Assessment provides an opportunity to individualize a part of the curriculum to meet the needs of students. It facilitates feedback to the student at various stages of the experience. This helps to build their self-confidence as students proceed with their studies. School-Based Assessment also facilitates the development of the critical skills and abilities that are emphasized by this **CSEC®** subject and enhances the validity of the examination on which the candidate's performance is reported. SBA, therefore, makes a significant and unique contribution to both the development of relevant skills and the testing and rewarding of students for the acquisitions of those skills.

During the course of study for the subject, students shall obtain marks for the competence they develop and demonstrate in undertaking their SBA assignments. These marks contribute to the final marks and grades that are awarded to students for their performance in the examination.

The guidelines provided in this syllabus for selecting appropriate tasks are intended to assist teachers and students in designing assignments that are valid for the purpose of SBA. These guidelines are intended also to assist teachers in awarding marks that are reliable estimates of the achievement of students in the School-Based Assessment component of the course. In order to ensure that the scores awarded by teachers are in line with the **CXC®** standards, the Council undertakes the moderation of a sample of the School-Based Assessment assignments.

The Caribbean Examinations Council seeks to ensure that the SBA scores are valid and reliable estimates of accomplishment. Candidates are provided with the guidelines below in order to successfully complete the SBA.

The School-Based Assessment seeks to provide students with the opportunity to demonstrate their problem-solving and programming skills as well as their ability to use productivity tools effectively in:

1. entering, manipulating and presenting text data;

2. simulating a worksheet;

3. entering data, performing simple analysis on data and presenting data using a database management tool; *and,*

4. *applying programming language code to automate a segment of the project.*

ASSIGNMENT

The School-Based Assessment consists of one practical project consisting of *five* related components, prepared and marked by the teacher *in accordance with **CXC®** guidelines.*
The components will test Problem-Solving and Programming as well as the application of processes

involved in the use of Database Management, Spreadsheets and Word-Processing and Web Page Design. The *five* components will therefore cover the Specific Objectives in Sections 4, 5, 6, 7 and 8.

Types of Projects

Teachers should develop assignments that expose the students to realistic applications which involve, but are not limited to the following areas:

(a)   business (for example, storing and managing employee, customer and sales records, marketing);

(b)   banking (for example, creation of different types of accounts, loans, interest, payments on loans, fixed deposits, investments);

(c)   education (for example, enrollment in schools, academic record‑keeping);

(d)   entertainment (for example, analysis of data on distribution and sales of movies, music, electronic games);

(e)   environment (for example, records of storms and hurricanes over specific periods and in named territories, calculation of cost of damage to infrastructure, housing, livestock, farms);

(f)   law enforcement (collection and management of crime statistics collection and analysis of data on offenders, cost of maintaining prison populations);

(g)   medicine (for example, managing patient records collection and analysis of data on diseases over a period of time and in various locations);

(h)   monitoring (for example, analysis of data on accidents at intersections, counting and categorising visitor arrivals in Caribbean territories); and,

(i)   sports (for example, collection and processing of data on athletes' sport meetings).

Word-Processing

This assignment should consist of the formatting, importing and/or documentation of *information.* ***The assignment must be chosen from TWO of the following***:

(a)   a document containing a table of contents and/or prepared for mass mailing;

(b)   use of templates (such as memos, reports, faxes, simple brochures, flyers) or newspaper articles; and,

(c)   a fillable form using the Developer. It should comprise no more than four controls (for example, text box, drop-down list, check box or date picker). The controls can be used more than once when designing the form. Manipulation of the controls should be limited to renaming labels and prompts (tags), and adding drop-down list properties;

Web Page Design

This assignment should be limited to one web page that is designed using a word processor or a free online web service. Students can insert screenshots or create the design of the web page at the end of the word-processed document. Alternatively, they can use the last page in their word-processed document to paste the link to the online web page. Only the candidate number placed near the top of the page should be used as a form of identification for the web page.

The web page should contain at minimum:

(a)   a logo depicting the concept of the project;

(b)   defined areas on the page for navigational links and content; and,

(c)   at minimum two hyperlinks of the following:

- *link to a location within the web page;*

- *link to an email address;*

- *link to another web page (which may or may not exist); and,*

- *link to user-created files.*

Spreadsheet

This assignment should be saved as one workbook (comprising two or more worksheets). The tasks should be limited to:

(a)   a maximum of TWO major tasks (for example, create the spreadsheet; modify the spreadsheet) consisting of no more than THREE requirements (for example, sorting of data and use of functions and formulas on data); and,

(b)   the creation of no more than TWO types of charts.

Database Management

This assignment should be saved as one database file. The tasks should be limited to no more than:

(a)   THREE tables or files.

(b)   TWO queries (using criteria from one table, and more than one table).

(c)   ONE calculation within queries.

(d)   ONE form, showing a main and sub-form (for example, to search for a record, or to move to the next or previous record).

(e)   ONE report, with grouping and sorting involving TWO or THREE tables.

Problem-Solving and Programming

This assignment should use programming language selected by the centre. Examples include but are not limited to:

(a)   prompting for data entry with appropriate validation with suitable messages output to the user; and,

(b)   input of data to variables and required calculations.

The code should be limited to:

(a)   Input of values or sets of text.

(b)   Output of results or messages.

(c)   Conditional branching (if-then; if-then-else, or case).

(d)   Iterations/Looping (for, repeat, or while).

The problem-solving section must be submitted as a PDF document.

Requirements	Guidelines
Cover sheet	*The information supplied here is essential since it is used to associate the submission with a particular candidate.*
Problem definition	*Students should provide the statement of the problem, that part of the problem that was chosen for coding in the spreadsheet.*
Algorithm	*Students are expected to include flowcharts or pseudocode for the segment of code that will be written.*
Source code	*A copy of the programming language code.*
Trace Table using test data	*Students are required to supply the test data that produced the output. This information would be necessary to determine whether the tasks have been performed correctly.*
Program execution	*Students are required to submit screenshots of working program showing data entry and results produced.*

ROLE OF THE TEACHER

The role of teacher is to:

(a)   *Assign* the project for the School-Based Assessment.

(b)   Provide guidance throughout the life of the projects. *The teacher should work* with candidates to develop a project management chart *with definite timelines for achieving clearly*

identified objectives, from project inception to project completion.

(c)   Guide students through the SBA by helping to clarify the problem or by discussing possible *approaches to solving the problem*. Teachers, *while giving guidance*, should guard against *providing a complete solution to the problem for the candidate or* prescribing a specific format *that* should be followed.

(d)   Assess student's skills in problem-solving and algorithm development using flowcharts or pseudocode, coding an algorithm *using the selected programming language* and the effective use of productivity tools to perform prescribed activities. The development of the project is a continuous exercise that occurs during scheduled class hours as well as outside class times. At a time to be determined by the teacher the relevant component will be assessed and the marks recorded. *Copies of the completed documents should be kept by both the teacher and students.* The teacher should use the mark scheme provided by **CXC®** and include any comments pertinent to the conduct of the assessment.

(e)   Guide students through the SBA by helping to clarify the problem or by discussing possible formats.

(f)   Ensure that students are allowed sufficient access to equipment to allow successful completion of their projects.

SCOPE AND SIZE

The project should be the size and complexity for candidates to satisfactorily complete during the second year of the two-year course.

The WP and WBD, SS and DB sections of the project should each have approximately the same number of tasks and degree of complexity such that each project requires the same amount of preparation. The project should encompass some advanced processes in *Sections 4, 5 and 6.* Problem-Solving and Program Implementation should be based on the project and not attempted in isolation. It must, therefore, be an actual implementation of a simple aspect of the project.

Teachers are encouraged to design their School-Based Assessment at the commencement of the academic year. This would allow for the completion of sections of the project as topics are addressed. It is suggested that the Problem-Solving component be attempted when the teacher has completed Section 7 of the syllabus, and the Program Implementation component at the completion of Section 8.

ASSESSMENT CRITERIA

The following is the mark scheme for assessing SBA assignments. Teachers must clearly indicate the breakdown of the marks allocated for each question on the candidates' SBA paper.

Note to Teachers: The marks for the WP and WPD, SS and DB are to be summed and divided by 2 in order to provide the Productivity Tools mark out of 35.

WORD-PROCESSING – Maximum of 20 marks

Since teachers may vary the focus of their SBA from year to year, the Word-Processing component offers some choice. To obtain the 20 marks for Word-Processing, teachers may:

- *Choose TWO of the three features:* **tables, columns, and inserting/importing files. (2 marks each)**
- **Choose TWO of the three advanced features: Mail merge, table of contents and fillable forms. (5 marks each)**

All other objectives are compulsory

Specific Objective	Key Skills The effectiveness with which the candidate(s) has/have confidently used and/or manipulated:	Mark Allocation	Maximum marks per sub-section
	The following are compulsory (SO3).		
S4: SO3	**Document Formatting features**		**(4)**
	No more than <u>FOUR</u> features to be tested: • Any <u>TWO</u>: bold, underline, italics • Justification (centre, right, full) • Changes in line spacing • Superscript and/or subscript • Changes in font or font size • Page numbering		
S4: SO3	**Page Layout**		*(2)*
	• *Any* change in margins, page orientation, paper sizes or text orientation • Correct use of header OR footer OR footnotes OR endnotes	1 1	
	Select any two of the following (SO1 and SO2).		
S4: SO1	**Inserting/importing files**		**(2)**
	• Graphic / chart in document • Graphic/chart/table sized appropriately to fit in desired location/margins	1 1	
S4: SO2	**Columns**		**(2)**
	Correct use in entire document or selected text Mostly correct in document or selected text	2 1	
S4: SO2	**Tables**		**(2)**
	Correct number of rows and columns Correct formatting of table (e.g. border, shading of cells, colour)	1 1	
Specific Objective	Key Skills The effectiveness with which the candidate(s) has/have confidently used and/or manipulated:	Mark Allocation	Maximum marks per sub-section
	Select any TWO of the following (SO6, SO7 or SO8).		

S4: SO6	Table of Contents		(5)
	• Auto-generation of table of contents	1	
	• In suitable location	1	
	• At least TWO levels of headings	1	
	• Suitable headings chosen (1 mark EACH)	2	
S4: SO7	Mail Merge Facility		(5)
	Selection or creation of required merge fields in:		
	• Data source	1	
	• Primary document (final document consistent with merged document)	1	
	Insertion of correct merge field in:		
	• Appropriate section	1	
	• Correct merge	2	
S4: SO8	Fillable Forms		(5)
	Appropriate use of at least THREE of:		
	• Option boxes, check boxes, text boxes, date picker, drop-down lists, and command buttons	3	
	Layout of form for ease of use		
	• Layout clear and easy to follow	2	
	• Some aspects of layout not clear or easy to follow	1	

WEB-BASED DESIGN (10 marks)

Specific Objective	Key Skills *The effectiveness with which the candidate(s) has/have used or applied*	Mark Allocation	Maximum marks per sub-section
S4: SO9	**Appropriate design features to create a simple web page**		**(3)**
	• *Inclusion of graphics and text* • *Appropriate use of text* • *Appropriate use of graphics*	*1* *1* *1*	
S4: SO9	**Web page for intended audience**		**(2)**
	• *Layout suitable for intended audience* • *Mostly suitable for intended audience*	*1* *1*	
S4: SO12	**Consistent Information on the page specific with requirements**		**(3)**
	• *Majority of information consistent with requirements* • *Somewhat consistent with requirements* • *A few aspects are consistent with requirements*	*3* *2* *1*	
S4: SO11	**Hyperlinks**		**(2)**
	The presence of a link for any TWO of the following: • *link to another web page;* • *link to a location within the web page;* • *link to an email address; and,* • *link to user-created files.*		

SPREADSHEET – 20 marks

Specific Objective	The effectiveness with which candidate(s) use(s) or manipulate	Mark Allocation	Maximum marks per sub-section
S5: SO3	**Pre-defined systems functions –** 1 mark each for correct use of any **THREE** functions		**(3)**
	• *Correct use of any **THREE** different functions*	*3*	
S5: SO4	**Arithmetic formulas** – *1 mark* each for any **THREE** formulas		**(3)**
	• *Correct use of any **THREE** different formulas*	3	
S5: SO5	**Replicate formulas into other cells**		**(2)**
	• Use of absolute addressing or range names (two different examples)	2	
S5: SO6	**Spreadsheet formatting**		**(4)**
	• Any TWO: Decimal place, currency, comma, percentage features • Justified, left, right, centre, font or font size • <u>Advanced</u> use such as merging cells, wrap text	2 1 1	

Specific Objective	The effectiveness with which candidate(s) use(s) or manipulate	Mark Allocation	Maximum marks per sub-section
S5: SO7	**Sorting data in the spreadsheet**		**(1)**
	• Data sorted in ascending/descending order as required	1	
S5: SO7	**Extracting data**		**(2)**
	• Simple filter in place	1	
	• Evidence of criteria (for example, B3<20)	1	
S5:SO7	***Pivot Tables***		***(1)***
	• *Use of pivot tables to summarise a large group of data*	1	
S5: SO8	**Charting operations**		***(3)***
	• Ability to select required range of adjacent/non-adjacent cell for use in a chart	1	
	• Appropriate chart such as bar/column chart, line graph, pie chart	1	
	• *Appropriate labelling of chart title, chart axes and/or data labels*	1	
S5: SO9	**Use of two or more sheets**		**(1)**
	• Linking of cells in different sheets	1	

DATABASE MANAGEMENT – 20 marks

Specific Objective	The effectiveness with which candidate(s) use(s) or manipulate features to	Mark Allocation	Maximum marks per sub-section
S6: SO3	**Create a database**		**(5)**
	• Appropriate fieldnames	1	
	• Appropriate data types	1	
	• Populating table	1	
	• Create minimum of two database tables/files	1	
	• Selecting a suitable primary key	1	
S6: SO3	**Simultaneous use of two or more tables/files**		**(2)**
	• Joining between pairs of database tables/files	1	
	• Evidence of relationship (1:1 or 1:M)	1	
S6: SO4	**Create queries**		**(5)**
	• Simple query (1 criteria)	1	
	• Complex query: >1 criteria (1) using more than one table (1)	2	
	• Correct use of and result from calculated field in query	2	
	Create forms		**(2)**
	• Form with sub-form created	1	
	• Appropriate fields for sub-form	1	
S6: SO4	**Sort a database table/file/Report**		**(1)**
	• Evidence of sort	1	
S6: SO5	**Generate reports**		
	• Selection of appropriate fields for report	1	**(5)**
	• Statistical and/or summary features (for example, count, sum, average)	1	
	• Grouping required fields	1	
	• Correct specific report title (2)	2	
	– Generic report title only (1)		

PROBLEM-SOLVING AND PROGRAMMING (15 marks)

Specific Objective	The effectiveness with which candidate(s) employed techniques to create or design	Mark Allocation	Maximum marks per sub-section
S7: SO5	**Flowchart or pseudocode**		**(6)**
	• Start of Algorithm	1	
	• Identifying user-friendly variable names	1	
	• Initialising variables	1	
	Processing		
	• Request for data (prompt)	1	
	• Storing data (reading data)		
	• Appropriate and logical use of structures		
	– Selection	1	
	– Looping	1	
S7: SO7	**Trace table**		**(4)**
	• Variables identified in trace table	1	
	• Appropriate test data	1	
	• Changes in values correctly demonstrated	2	
	– *Some errors in manipulating the trace table*	1	
S8: SO2	**Program Execution**		**(1)**
	• Working program	1	
	Program language features / working solution		**(3)**
S8: SO5	Variable initialization	1	
	Control structures:		
	• Appropriate use of selection statements (if-then, if-then-else, or case statement)	1	
	• Looping – (while, repeat or for)	1	
S8: SO7	**Documentation**		**(1)**
	Program documentation (such as author, date created, statement of problem, and suitable inline comments)	1	

PROCEDURES FOR REPORTING AND SUBMITTING SCHOOL-BASED ASSESSMENT

(a)   Teachers are required to record the mark awarded to each candidate under the appropriate profile dimension on the mark sheet provided by **CXC®**. The completed mark sheets should be submitted to **CXC®** no later than 30 April of the year of the examination.

   Note: The school is advised to keep a copy of *all projects* as well as copies of the mark sheets.

(b)   Teachers will be required to submit to **CXC®** *electronic* copies of the projects of a sample of candidates as indicated by **CXC®**. This sample will be re-marked by **CXC®** for moderation purposes.

   Note: The SBA Data Capture Module of the Online Registration System (ORS) must be used for the submission of ALL SBA marks.

MODERATION OF SCHOOL-BASED ASSESSMENT

The candidate's performance on the project will be moderated. The standard and range of marks awarded by the teacher will be adjusted where appropriate. However, the rank order assigned by the teacher will be adjusted only in special circumstances and then only after consideration of the data provided by the sample of marked projects submitted by the teacher and re-marked by **CXC®**.

EQUIPMENT

The equipment should include an IBM-compatible computer with software that is capable of integration among word-processing, spreadsheet and database management applications. *Visual Basic for Applications is a built-in component of the Microsoft suite of applications and will be used for teaching of the programming section of the syllabus. **CXC®** will not be responsible for partial assignments submitted due to software in compatibility and/or integration problems.*

♦ *RECOMMENDED TEXTS*

Birbal, R. and Taylor, M.

Log On to IT for CSEC. Essex: Pearson/Longman, 2005.

Gay, G. and Blades, R.

Information Technology for CXC CSEC. Oxford: University Press, 2005.

Holligan, J. and Doyle, S.

IT FOR CSEC. Cheltenham: Nelson Thornes, 2006.

Jamrich, P. and Oja, D.

New Perspectives on Computer Concepts, 10th edition. Course Technology. Washington D.C. Thomson Publishing, 2007.

Robertson, L.

Simple Program Design – A Step by Step Approach. Course Technology, Washington D.C., 2006

Skeete, K.

CXC Information Technology. Cambridge: University Press, 2004

WEBSITES

http://www.gcflearnfree.org/subjects/technology/

http://www.excel-easy.com/vba.html

https://support.office.com/en-us/article/Create-a-fillable-form-39a58412-107e-426b-a10b-ac44937e3a9f

http://bigdata-madesimple.com/5-advantages-and-disadvantages-of-cloud-storage/

https://www.saylor.org/site/textbooks/Information%20Systems%20for%20Business%20and%20Beyond.pdf

♦ *GLOSSARY OF INFORMATION TECHNOLOGY CONCEPTS*

WORD	DEFINITION
Address	The identification of a particular location in memory where a data item or instruction is stored.
Algorithm	A sequence of instructions which rigorously defines a solution to a problem.
Assembler	A program which converts ASSEMBLY LANGUAGE into MACHINE CODE to be used by a computer.
Automation	Computer control of machines and processes.
Bandwidth	A characteristic of a communication channel that determines the speed at which data can be transmitted over the channel.
Bar code	A series of thick and thin black bars separated by spaces of varying widths representing data.
Bistable device	A device which can exist in two discrete stable states.
Bit	An acronym for binary digit. It can have a value of 1 or 0.
Blog	*Short for "Web log". A blog is an online journal or diary of an individual's opinions and latest news. It is updated regularly, in chronological order. Many blogs allow visitors to make comments, or "postings" in response to the blogger, or to ask questions.*
Broadband	*A term used to describe a technology that provides bandwidth that is greater than that provided by ordinary telephone lines, that is, greater than 64 kilobits per second. The greater the bandwidth, the greater the data-carrying capacity.*
Broadcast	*The transmission of data to all connected stations simultaneously.*
Byte	A group of eight bits, usually representing a single character.
CADD	Acronym for computer-aided design/drafting. The use of computers and graphics in design and drafting process.
CAM	Acronym for computer-aided manufacturing. The use of computers to control machines in the manufacturing process.
Character	One of the set of symbols that may be represented in a computer. Characters may be letters, digits, symbols.
Character codes	Binary patterns used to represent characters in a computer system.

WORD	DEFINITION
Cloud Computing	The use of a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.
Cloud Storage	A cloud computing model in which data is stored on remote servers and can only be accessed via the Internet, or "cloud." It is maintained, operated and managed by a cloud storage service provider.
Compiler	A program that translates the source program into executable machine code, and saves the code to a file (the object program) for later execution.
CPU	*Central Processing Unit*
Data corruption	The introduction of errors into data stored in a computer system.
Database	A collection of data files that may be used by a number of applications with storage and access to the data controlled by a set of programs known as Database Management System (DBMS).
Database management system	Programs and database files that allow timely and easy controlled access to data by a number of users.
Download	Process whereby programs or data are transferred via communications channels from a computer and stored on media located at the user's computer.
Dry-run	A manual traversal of the logic of a program.
DVD	*Digital Video Disk or Digital Versatile Disk. A high-density compact disk for storing large amounts of data, especially high-resolution audio-visual material.*
Electronic mail	Mail or messages transmitted electronically by computers via communication channels. It is usual for such messages to be held in a central store for retrieval at the user's convenience.
Ergonomics	*A field of study dealing with the comfort and safety of the human body by adjusting different designs in equipment, furniture, workstations and routines to fit the worker. (Ergonomics is used in the workplace to help prevent repetitive injuries.)*
Expert system	A software package that acts as a consultant or expert to the user. It is an "expert" in a specialised application or area and provides assistance to the user in solving problems in that area.
Field	*A component of a record designed to hold a single data item of a*

WORD	DEFINITION
	specified type.
Flowchart	*A graphical representation of an algorithm, comprising various symbols connected by arrows to show the step-by-step flow of data through a process.*
Font	A family or collection of characters (letters, punctuation marks, numbers and special characters) of a particular size and style.
Gigabyte	The equivalent of approximately one billion bytes.
Hard disk	A rigid disk used for storing data magnetically. Its rigid construction allows for higher storage densities. Access times for a hard disk are much faster than for floppy disks.
Hardware	The physical components of a computer system such as the Central Processing Unit (CPU), memory, input, output, and storage devices.
Home page	*The file available for access at a website intended chiefly to greet visitors, provide information about the site, and direct them to other sites with related information.*
HTML	*Hypertext Markup Language. A markup language used to structure text and multimedia documents used extensively on the World Wide Web.*
HTTP	*Hypertext Transfer Protocol. A protocol used to request and transmit files, especially Web pages and Web page components, over the Internet or other computer network.*
Information	Meaningful knowledge produced from raw data files.
Information retrieval	The process of retrieving specific information from data files.
Information Technology	*Information technology (IT) is the use of computers, storage, communication and other physical devices to create, process, store and exchange all forms of electronic data.*
Integrated package	This package combines several applications in a suite of programs. Most of these packages combine a word processor; spreadsheet and database program. Data are shared easily between these integrated programs.
Internet	*The Internet is the largest computer network system in the world. It consists of many smaller networks connected together by a global public network. The Internet is often called the information*

WORD	DEFINITION
	superhighway or cyberspace.
Intranet	*An intranet is a private network that belongs to an organization, and is designed to be accessible only by the organization's members, employees, or others with authorization. When part of an intranet is made accessible to customers, partners, suppliers, or others outside the company, that part is called an <u>extranet</u>.*
Interpreter	A computer program which interactively translates and executes a source program without permanently storing any executable code.
Joystick	An input device that uses a lever to control movement of the cursor or graphic images.
Justification	This is the adjustment of alignment of one or more lines of text with a particular margin, for example, alignment with the left margin, the right margin or both. The term justification often is used to refer to full justification of the alignment of text along both margins.
Keyboarding	The process of rapidly and accurately entering data into a computer via the keyboard as an input device.
Kilobyte	One thousand and twenty-four bytes.
LAN	Acronym for Local Area Network. A type of computer network where two or more computers are directly linked within a small area such as a room or building site. A common characteristic of this system is that computers are linked by direct cables rather than by telecommunication lines.
Light pen	A light-sensitive input device which when it touches the screen detects the presence or absence of light. It is used to select an entry or indicate a position.
Magnetic disk	A mylar (floppy disk) or metallic (hard disk) circular plate on which electronic data can be stored magnetically. Suitable for direct or random access data storage and retrieval.
Mail-merge	A facility found in full-fledged word-processing programs that draws information from a database, usually a mailing list, to print multiple copies of a document. Each copy contains some common text but each bearing different addresses.
Mainframe	A large-scale computer with a variety of peripheral devices, a large amount of backing store and a fast CPU. The term is often used in comparison with a smaller or subordinate computer. It should be noted that there is no clear dividing line between mainframes and minicomputers.

WORD	DEFINITION
Margins	*Space provided to the left, right, top and/or bottom of a page of text or data.*
Menu	A screen listing commands of action or alternatives to lead the user through an interactive program.
Menu-driven Interface	*A Program interface where the user is provided with a list of operations.*
Merge	The combination of two or more files on the basis of common field (key field).
MICR	Magnetic Ink Character Recognition.
MIDI	Musical Instrument Digital Interface. A standard for representing musical information in a digital format.
Microcomputer	A computer based on a microprocessor. See definition of microprocessor below.
Microfiche	An output medium consisting of microfilm sheets. Very high density storage can be attained using this method of storage.
Microprocessor	A single chip which contains the arithmetic/logic unit (ALU) and the control unit (CU).
Modem	Acronym for modulator-demodulator. A device that converts signals from analogue to digital and vice versa. *A modem allows computers t o exchange information through telephones lines.*
Monitor	A television-like device used to display data.
Mouse	An input device that controls the movement of the cursor. The cursor moves in response to the movement of the mouse on a flat surface.
Multiprocessing	*The ability of a computer to execute programs on two or more processors simultaneously. The program is distributed over several processors.*
Multitasking	*The concurrent execution (at the same time) of two or more related tasks. A group of cooperating tasks is executed simultaneously to achieve a common goal.*
Narrowband	*A term used to describe a technology that provides bandwidth that is less than or equal to that provided by ordinary telephone lines. That is, 64 kilobits per second or less.*
Online	*The term is used to describe peripheral devices under the control of*

WORD	DEFINITION
	the processor.
Off-line	*Describes peripheral devices that operate independently and are not under the control of the processor.*
Operating system	A set of programs that control and supervise the resources of a computer system. It also acts as an interface between the user and the computer.
Peripheral	Any hardware device connected to and controlled by the central processing unit.
Plotter	An output device specially designed to produce a hard copy of graphical data.
Point of sale terminal	A device that reads data at the source of a transaction (for example. a supermarket checkout) and stores it for subsequent transmission directly to the computer system for processing.
Primary Memory	*Random Access Memory and Read Only Memory.*
Printer	*A device specially designed to produce a hard copy of computer output.*
Protocol	A set of rules and procedures controlling the transmitting and receiving of data so that different devices can communicate with each other.
Pseudocode	A language consisting of English-like statements used to define algorithm.
Real-time	A processing mode in which the passage of real-time is critical to the application.
Record	A collection of fields on data related to one entity.
Resolution	A characteristic of a monitor's screen, determined by the number of pixels that can be displayed by it.
Software	A collection of programs, procedures and routines which direct the operations of a computer.
Software package	A fully documented program or set of programs generalized and designed to be used with little or no modification.
Sort	Redistribution of data into an order on the basis of the contents of a key item (sort-key).
Source code	Program written in high level language or assembly level language.

WORD	DEFINITION
Source document	A document used for the initial recording of data relating to business transactions. Very often source data needs to be converted into machine-readable form for example, punched cards or paper tape, before it can be processed by a computer.
Spell-check	A dictionary feature associated with a word processor which allows the user to easily detect and correct errors in spelling. One can add new words to the dictionary so that the latter may grow with usage, for example, in WordPerfect, WordStar and Microsoft Word.
Syntax	A set of rules defining the structure of statements in a programming language.
Telecommunication	The process of transmitting data between devices using transmission facilities such as telephone lines or microwave links.
TCP/IP	*(Transmission Control Protocol/Internet Protocol) These are a set of rules and regulations followed by computers on the Internet to communicate.*
Telecommuting	A method of working where an offsite employee uses computer and a communication channel to communicate with the office computer.
Telemarketing	The employment of telephone lines and computers to market products and manage accounts.
Touch terminal	Also called a touch screen. A device that allows data to be input by touching a screen with the finger or other object. The surface of the screen consists of a number of programmed touch points each of which may trigger a different action when selected by the user.
Turnaround document	A document which, after being output by the computer, can be used to record data.
Upload	Process of reading data from a user's computer storage and sending it to another computer via communication channels.
URL	*Each page on the World Wide Web has a unique address called the Uniform Resource Locator (URL).*
Validation	A checking process in a program which is aimed at finding out if data is genuine. Validation should be carried out on any data that is entered from the keyboard, even when this is simply a Y or N response.
Variable	*An area of storage whose value can change during processing.*
Verification	*Specific checks that ensure that the data entered matches (or is*

WORD	DEFINITION
	identical to) the data at the original source.
VoIP	*Acronym for Voice over Internet Protocol. It is a protocol which governs the transmission of voice over the Internet. VoIP is often used abstractly to refer to the actual transmission of voice (rather than the protocol implementing it). VoIP is also known as IP Telephony.*
Web browser	*A programme that allows users to view and explore information on the World Wide Web. Examples of popular browsers are Microsoft Internet Explorer and Mozilla Firefox.*
Web page	*A document on the World Wide Web, consisting of an HTML file and any related files for scripts and graphics. It is often hyperlinked to other Web pages.*
Web server	*A computer that delivers (serves up) Web pages. When a request is made to access a website, the request is sent to the web server. The server then fetches the page and sends it to your browser.*
Website	*A set of interconnected Web pages, usually including a home page, generally located on the same server, and prepared and maintained as a collection of information by a person, group, or organization.*
World Wide Web (WWW)	*The World Wide Web commonly referred to as the 'Web', is a graphical easy-to-use system of inter-linked files on the Internet. Vast amounts of information can be obtained through the use of the www.*

♦ *GLOSSARY OF BEHAVIOURAL VERBS USED IN THE INFORMATION TECHNOLOGY EXAMINATIONS*

Analyse	Examine key factors and constituent parts critically and in detail and suggest possible results/outcomes.
Assess	Present possible explanations or reasons for the importance of a particular structure, relationship or process and say what would be the appropriate explanation.
Classify	Place into groups according to observable characteristics, attributes, features or qualities.
Compare/Contrast	Identify and describe/examine similarities and differences between two elements/concepts/entities of the same or different kinds.
Define	Provide a brief statement giving the precise meaning of or outlining the nature, properties or essential qualities of a term, concept, and principle.
Describe	Provide statements of the features or characteristics of an object or process.
Differentiate/Distinguish	Provide an explanation of the differences between entities which allow them to be placed in distinct groups.
Discuss	Give a careful explanation of a concept or statement by providing a definition and explaining the arguments for or against it.
Evaluate	Explain the evidence for or against a given topic or concept and come to a conclusion.
Explain	Provide detailed, logical statements which make clear what happened, how it happened and why it happened.
Identify	Point out or describe distinguishing features (without giving explanation).
Illustrate	Show clearly by using appropriate examples, diagrams or sketches.
Label	Identify structures or parts with the use of pointers.
List	Itemize answers concisely and in order if specified.
Manipulate	*To use, modify or update original data, values or items.*
Name	Provide accurate labels, words or statements.

Outline	Give basic steps, organize information concisely to provide main points or features only.
Plan	Provide an outline of steps to be followed or the scheme of arrangements.
State	Provide a short concise answer without explanation.

__Western Zone Office__
3 August 2017

SAMPLE SCHOOL-BASED ASSESSMENT

Description of the Project
National general elections have been a recurring feature among the democratic territories of the Caribbean. Every year, in one territory or another, citizens exercise their right to elect a government of their choice. However, the exercise is not without its attendant challenges of data management. Thousands of votes are cast on the day of the elections and an anxious, waiting public demands speed, efficiency and accuracy in the determination of results.

In preparation for the actual exercise, the Trinbarjam Elections Commission has hired you to simulate the elections exercise as a test run, prior to the actual elections which are to take place shortly in your country. You are required to utilize suitable word-processing, web page design, spreadsheet, database management as well as a programming application to design and implement computer-based solutions to the tasks involved in the simulation of the election process.

Spreadsheet
The Elections Commission has mandated that you design a spreadsheet that will accept pertinent data on constituencies and candidates' votes and generate information that would enable the outcome of the elections to be divulged to the population in the shortest possible time. **Four parties contest the elections: The Democratic Action Party (DAP), the Workers National Alliance (WNA), the United Progressive Movement (UPM), and the People's Democratic Revolution (PDR).** The spreadsheet is design to accept data from seven constituencies.

You are required to:

Task 1

1.   (a) Design a spreadsheet with the below table in sheet 1.

Constituency	Percentage Voter Turnout
North	0.75
South	0.85
East	0.90
West	0.80
North West	0.75
South West	0.88
East Central	0.82

(b) Using **another** worksheet design a table to record the:
- Constituency
- Number of voters (The number of voters in a constituency ranges from 6,250 to 10,795.)
- Votes Cast
- Candidate's name
- Candidate rating (The rating assigned to candidates are 15, 20, 30 and 35. These ratings were determined by the results of a recent poll conducted in each

constituency by a noted pollster. **Each candidate in a given constituency has a unique rating**.)

* Party name

You must enter data for each candidate in each of the seven constituencies. **Use the Percentage Voter Turnout data to determine the number of votes cast (number of voters * percentage voter turnout).**

Rename the worksheet as Elections Data
Save your spreadsheet as **Elections**

Task 2

Duplicate the Elections Data worksheet. Rename the duplicate as Elections Data Backup.

Modify the Elections Data worksheet as follows:

1. (Insert a column before the one which displays the name of the political party. Using an appropriate column title, determine the votes received by each candidate in a given constituency. **The candidate's rating represents the percentage of votes received by the candidate in a given constituency. For example, given that 6400 votes were cast and a candidate has a rating of 20, the votes received by the candidate would be 20/100*6400.**

Format the votes received by each candidate to zero decimal places.

2. Sort the data first on party (ascending order) and secondly on votes received (descending order).

3. The Trinbarjam Elections Commission needs to determine the following:
    * Whether or not a refund is due to a candidate. Use an appropriately labelled column to state "Refund Due" or "No Refund" for each candidate. A refund is due if the candidate's votes received equals or exceeds 20 per cent of the votes cast in the constituency.
    * A list of all candidates who should receive a refund. Extract the data to the bottom of the worksheet.
    * A table with summary data for the elections

Elections Data			
Party	Total Votes Received	Percentage of Votes Cast	
Total Votes Cast			
Constituency	No. of Voters	Votes Cast	Abstention

Note the following:
- **Format the Percentage of Votes Cast to one decimal place with the percent symbol.**
- **Centre the data in the worksheet.**
- **Merge and centre the cells in the row with the label "Elections Data"**

Charting and Summary Operations

Generate a column graph that compares the votes cast and abstention data by constituency. Provide an appropriate title, label the axes and display the data labels.

Create a pivot table showing the constituencies, the candidates' names and the total number of votes the candidates received.

Save your spreadsheet as **Elections**

Database Management

You are asked to use a suitable application to manage data on candidates nominated to contest seats in the general elections. Three tables must be used to store the data. The table with relevant personal data on each candidate should include: name, address, date of birth, gender, profession, constituency, constituency number, party and votes received. The constituency data table should include: the constituency name, constituency number and the number of voters in each constituency. An elections data table should include: the constituency number and the percentage voter turnout for each constituency.

The data to populate the tables must be sourced from the spreadsheet section of your project.

You should test your database by generating queries, reports and control forms:

Queries:

1. List the name, sex, age and profession of all candidates from the People's Democratic Revolution (PDR)

2. List the candidate name, party, number of voters and number of votes received for candidates in constituencies with more than 6500 voters and where the candidates received less than 1000 of the votes. Sort the data in descending order on the number of votes received by the candidate.

3. Using a calculated field determine the total votes cast in each constituency.

Report

4. Generate a report which lists the constituency, number of voters in the constituency, name of candidates, gender, party and number of votes received. The report should be grouped by constituency. Within each constituency the report should be sorted in descending order by number of votes received by each candidate. It should also give the total and average number of votes in each constituency. The report should have a two-line title as follows:

"Official Results
Trinbarjam National Elections"

Control Forms
5.   Create a form to display information about the candidates.

Word-processing

Document 1
1.   Each candidate must complete and submit a nomination form to the Trinbarjam Elections
        Commission. You are required to:
        (a)   Design a fillable nomination form. It must allow for the entry of relevant data on the
                candidate, including the constituency which he/she intends to contest.
                (i)   The letter head (with company Logo) of the Trinbarjam Elections Commission
                         should be placed at the top.

Document 2
2.   The results of the national elections must be delivered to each candidate. Using a suitable
        feature of your word processing application;
        (a)   Create a document which should be mailed to the candidates. The requirements for
                the letter are:
                (i)   It must be design on letter sized paper and must have a 0.7" margin on the
                         left and right sides.
                (ii)   The commission's letterhead (with company Logo) should be placed as the
                         header in the letter. The font in the letterhead should be appropriately
                         formatted for emphasis.
                (iii)   Candidate's address
                (iv)   Salutation
                (v)   The first paragraph should congratulate and thank the candidates (insert
                         candidate's name in the letter) for the manner in which he/she conducts his
                         or her campaign,
                (vi)   A summary table of results should be included with at least seven rows and
                         three columns, with appropriate formats.
                (vii)   The third paragraph inviting him/her to view the complete listing of the
                         results on the commission's website and conclude the letter.
                (viii)   Close with your name, your position is Chief Electoral Officer

Web Page Design
The Trinbarjam Elections Commission has requested that you design a web page to provide the public
with general information about the election. The web page should include the following:
*   The commission's logo
*   Display information about the elections (for example the total votes received by each party
        and the number of votes cast in each constituency).
*   Links to the commission's email address and a web page which displays past election data
        results (this web page may or may not exist).

Data used in the web page should be sourced from the spreadsheet section of the project.

Problem-Solving

1.   Develop an algorithm to print the names of the candidates who should receive a refund. A refund is due if the candidate's votes received equals or exceeds 20 per cent of the votes cast in the constituency. The algorithm should also determine and print the number of candidates who received a refund. Test the algorithm with data from ten candidates. The algorithm must accept as input the names of the candidates, votes received and the votes cast in the constituency. The algorithm should print the name of the candidate and the words "Refund Due" or "No Refund" and the number of candidates who received a refund. **Data to test the algorithm must be sourced from the spreadsheet section of the project.**

2.   Design and execute a trace table to test the algorithm developed in question (1) above. The table should have a maximum of ten iterations.

Program Implementation

1.   (a) Develop a problem statement for the algorithm developed in question (1) above.

        (b) Using the programming language Pascal or VBA, write code to implement/automate the algorithm in question (1) above.

CARIBBEAN EXAMINATIONS COUNCIL

Caribbean Secondary Education Certificate®
CSEC®

INFORMATION TECHNOLOGY

Specimen Papers and Mark Schemes/Keys

Specimen Paper:	-	Paper 01
		Paper 02
		Paper 032
Mark Scheme and Key:	-	Paper 01
		Paper 02
		Paper 032

C A R I B B E A N   E X A M I N A T I O N S   C O U N C I L

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

INFORMATION TECHNOLOGY
TABLE OF SPECIFICATIONS

SPECIMEN PAPER 2017

PAPER	SECTION	PROFILE	COGNITIVE LEVEL	NUMBER OF ITEMS	TOTAL ITEMS PER SECTION
Paper 01 (30%)	1. Theory	Theory	Knowledge and Comprehension	40	35
	2. Productivity Tools	Productivity Tools			15
	3. Problem Solving and Programming	Problem Solving and Programming	Use of Knowledge	20	10
			TOTAL no. of ITEMS	**60**	**60**

PAPER	QUESTION	PROFILE	COGNITIVE LEVEL	NUMBER OF MARKS	TOTAL MARKS PER SECTION
Paper 02 (45%)	1.	*Theory* *Productivity Tools*	*Knowledge and Comprehension* *Use of Knowledge*	*8* *12*	*20*
	2.	*Theory* *Productivity Tools*	*Knowledge and Comprehension* *Use of Knowledge*	*8* *12*	*20*
	3.	*Theory* *Productivity Tools* *Problem Solving and Programming*	*Knowledge and Comprehension* *Use of Knowledge*	*10* *15*	*25*
	4.	*Theory* *Problem Solving and Programming*	*Knowledge and Comprehension* *Use of Knowledge*	*10* *15*	*25*
			TOTAL no. of Marks	**90**	**90**

PAPER	QUESTION	PROFILE	COGNITIVE LEVEL	NUMBER OF MARKS	TOTAL MARKS PER SECTION
Paper 032 (25%)	1. Word Processing	*Productivity Tools*	*(Practical skills)*	*10*	*10*
	2. Spreadsheet	*Productivity Tools*	*(Practical skills)*	**10**	**10**
	3. Database Management	*Productivity Tools*	*(Practical skills)*	**10**	**10**
	4. Web page Design	*Productivity Tools*	*(Practical skills)*	**5**	**5**
	5. Problem solving and programming	Problem solving and programming	*Use of Knowledge*	**15**	**15**
			TOTAL no. of MARKS	**50**	**50**

CANDIDATE – PLEASE NOTE!

PRINT your name on the line below and return
this booklet with the answer sheet. Failure to do
so may result in disqualification.

TEST CODE **01229010**

SPEC 2017/01229010

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

INFORMATION TECHNOLOGY

Paper 01 – General Proficiency

1 hour 15 minutes
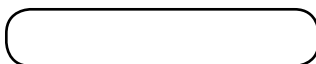
READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This test consists of 60 items. You will have 1 hour and 15 minutes to answer them.

2. In addition to this test booklet, you should have an answer sheet.

3. Each item in this test has four suggested answers lettered (A), (B), (C), (D). Read each item you are about to answer and decide which choice is best.

4. On your answer sheet, find the number which corresponds to your item and shade the space having the same letter as the answer you have chosen. Look at the sample item below.

Sample Item

Which of the following pairs represents general-purpose software tools?

(A) Spreadsheet and database software   Sample Answer
(B) Word processor and accounting software
(C) Student record system and database software   ● Ⓑ Ⓒ Ⓓ
(D) Insurance processing and spreadsheet software

The best answer to this item is "Spreadsheet and database software", so (A) has been shaded.

5. If you want to change your answer, erase it completely before you fill in your new choice.

6. When you are told to begin, turn the page and work as quickly and as carefully as you can. If you cannot answer an item, go on to the next one. You may return to that item later.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

1. When the computer is working on given instructions, it is called

(A) output
(B) storage
(C) processing
(D) input

2. Which of the following types of computers would process information at the fastest rate?

(A) Embedded
(B) Super computer
(C) Main Frames
(D) Mobile devices

3. Which of the following are functions of the control unit?

I. Read instruction
II. Direct operations
III. Execute instruction

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

4. Which of the following is a disadvantage of cloud storage?

(A) Accessibility (offline/without internet)
(B) Reduction of storage cost to organization
(C) Increased possibility for disaster recovery
(D) Efficient management of stored data

5. Which of the following storage media uses laser technology to store data?

(A) Flash Drive
(B) Magnetic tape
(C) CDROM
(D) Hard disk

6. Which of the following is an example of an embedded computer system?

(A) Desktop
(B) IBM z system
(C) Smart television
(D) Laptop

7. Which of the following input devices is used to read pencil or pen marks on a multiple choice answer sheet?

(A) OCR
(B) OMR
(C) POS
(D) MICR

8. The MOST suitable device for the output of architectural drawings is a

(A) plotter
(B) laser printer
(C) graphics tablet
(D) light pen

9. Which of the following output is an example of a hard copy?

(A) An oral speech delivered by a speaker
(B) A bill produced from a printer
(C) The display on a monitor
(D) A picture on a wall produced from a multimedia projector

10. Which of the following tasks would MOST likely require an advance graphics card?

(A) Program development
(B) Web browsing
(C) SBA development
(D) Video editing

11. In modern computers, the CPU speed is measured in

(A) kilohertz
(B) gigabytes
(C) kilobytes
(D) gigahertz

12. Quality Developers is a company that writes programs to do specific jobs for other companies. These programs are called

(A) general-purpose software
(B) special-purpose software
(C) custom-purpose software
(D) off-the-shelf software

13. Which of the following are software interfaces?

I. Graphical user interface (GUI)
II. Touchscreen
III. Menu-driven

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

14. Desreen has a desktop computer system. She turns on the system and waits five minutes but no image is displayed. During troubleshooting, which of the following is MOST likely to be identified as the problem?

(A) Screen setting incorrect
(B) The power cable to the Monitor is loose
(C) The battery power connected to the system is loose
(D) The resolution is set too low

15. Which of the following is the name of the interface used by blind persons to perform operations on a computer?

(A) Icon
(B) Sensor
(C) Braille
(D) Touchscreen

16. John is required to email a copy of his SBA to his teacher. This emailed copy is referred to as

(A) soft copy
(B) hard copy
(C) tangible copy
(D) machine readable copy

17. Vera is taking an online class and is required to enter her password twice. This process is called the

(A) storing process
(B) validation process
(C) verification process
(D) authenticity process

18. Which of the following would be the BEST option to expand your laptop's storage capacity?

(A) Memory card
(B) Magnetic tape
(C) CD-ROM
(D) DVD

19. James Café keeps payroll information stored in files on a cloud account. Which of the following BEST describes how these files can be accessed?

(A) Serial
(B) Random
(C) Sequential
(D) Indexed sequential

20. Which of the following statements BEST describes the term 'information'?

(A) It is raw facts.
(B) It is meaningful.
(C) It does not have any value.
(D) It is not the result of processing.

21. Which of the following technologies does NOT facilitate the transferring of data between computers in adjacent buildings?

(A) Bluetooth
(B) Fibre optics
(C) Microwave
(D) Twisted pair

22. Uploading or downloading data to or from a remote computer is done using

(A) blogging
(B) instant messaging
(C) Internet relay chat
(D) file transfer protocol

23. Each website on the Internet can be accessed by entering a unique address. This address is referred to as the

(A) HTTP
(B) HTML
(C) FTP
(D) URL

24. Which of the following network components is BEST suited for connecting LANS in a metropolitan area network?

(A) Hub
(B) Switch
(C) Router
(D) Modem

25. Teachers are able to mark class registers online, provide instant feedback on assessment, and share field trip posts in real time, through the use of

(A) social media tools
(B) m-learning devices
(C) simulation software
(D) computer assisted learning

26. Which of the following BEST defines 'cyberbullying'?

(A) Connecting to a network
(B) Using an electronic device to harass someone
(C) Using electronic devices to connect to WiFi
(D) Using mobile devices to send a message to someone

27. You received an email from someone who claims to be a representative from your school. The email asked you to click on a link to reset your password. You should proceed with caution because the email may be a

(A) spam threat
(B) malware attack
(C) phishing attack
(D) legitimate request

28. Using electronic devices to view a chat conversation between two friends, in real time, without their knowledge is

(A) propaganda
(B) a violation of privacy
(C) a denial of service attack
(D) an electronic eavesdropping

29. The use of "*********" to hide a password being entered into a computer system is termed

(A) antivirus
(B) phishing
(C) biometrics
(D) encryption

30. In an effort to secure data on a system, users are required to set a password in a specific format. Which of the following types of measures is this an example of?

(A) Physical
(B) Software
(C) Hardware
(D) Personal

31. Which of the following is a job task of a social media specialist?

(A) Maintaining a website
(B) Developing software for social use
(C) Installing or upgrading social media software on a computer system
(D) Generating and sharing content daily over a social media network

32. Which of the following are physical restrictions with respect to data security?

I. Firewall
II. Locking up the hardware
III. Biometric systems

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

33. Which of the following actions is NOT considered a computer crime?

(A) Piracy
(B) Hacking
(C) Encryption
(D) Industrial espionage

34. Including material obtained from online sources in an assignment and then submitting the assignment without giving credit to the online sources is referred to as

(A) plagiarism
(B) e-learning
(C) fraternization
(D) collaboration

35. Telecommuting can BEST be described as

(A) communicating between two companies
(B) working from home by connecting home and office
(C) working from home by having employees at home
(D) communicating between home and office

36. In word processing, an efficient way to move the third paragraph in order to place it after the fifth paragraph is

(A) cut and paste
(B) copy and paste
(C) copy, cut and paste
(D) cut, copy and paste

37. The two files used to produce merged letters during a mail merge are the

(A) primary document and data source
(B) primary document and merged letters
(C) data source and merged letters
(D) primary document and current letter

38. Which of the following should be considered when creating a website?

(A) Cost of each webpage
(B) Position of the homepage in the website
(C) Compiler needed to develop the website
(D) Intended audience for the website

39. Which of the following should be done before publishing a website?

(A) Compile the source code.
(B) Create the algorithm for the website.
(C) Ensure that all hyperlinks are working correctly.
(D) Purchase the software needed to develop the website.

40. What is the name of the highlighted word or picture in a webpage that a user can click on to go to another webpage?

(A) Hypertext
(B) Bookmark
(C) Hyperlink
(D) Connection

41. Text entered into a spreadsheet is aligned towards the left by default. These entries are called

(A) labels
(B) values
(C) formulae
(D) functions

42. Which of the following formatting features is unique to numbers in spreadsheets?

(A) Bold
(B) Italics
(C) Custom
(D) Indent

43. To centre the title rows of a spreadsheet across the columns

(A) centre align the title rows
(B) centre align the title columns
(C) merge and centre the title rows
(D) merge and centre the title columns

GO ON TO THE NEXT PAGE

44. Which of the following is an example of a spreadsheet function?

(A)   function sum(A1, A2, A3)
(B)   sum = A1 + A2 + A3
(C)   = sum(A1:A3)
(D)   = A1 + A2 + A3

45. Which type of application is BEST suited to prepare a budget?

(A)   Database
(B)   Spreadsheet
(C)   Word processor
(D)   Desktop publishing

46. Which of the following statements is NOT true of primary keys?

(A)   They are unique identifiers.
(B)   They are always in text form.
(C)   They do not contain blank values.
(D)   They may be composed of one or more attributes.

47. A field in a table that appears as a match of the primary key in another table is called a

(A)   foreign key
(B)   candidate key
(C)   secondary key
(D)   composite key

48. Which database feature can be used to list the names of the male students from a particular class?

(A)   Table
(B)   Form
(C)   Query
(D)   Report

49. What is the MOST appropriate database data type for a field holding the marks from a class test?

(A)   Text
(B)   Numeric
(C)   Currency
(D)   Date/Time

50. What is the name given to a collection of related fields in a database?

(A)   Table
(B)   Field
(C)   Record
(D)   Column

51. The following variables s, t and u, have been assigned the values shown.

$$s = 5$$
$$t = 6$$
$$u = 3$$

Which of the following statements does NOT evaluate to true?

(A)   u > 7 and t < = 7
(B)   s < t or u =< s − 2
(C)   t <> 4 or s = 5
(D)   u − 2 >= 1

52. Based on the following algorithm, what would be displayed for k?

$$j = 5$$
$$k = j$$
$$j = j + k$$
$$k = i + 3$$
$$\text{display } k$$

(A) 10
(B) 11
(C) 13
(D) 14

53. Which of the following algorithms does NOT display four consecutive numbers?

(A) for v = 2 to 5
   display v

(B) h = 1
   while h < 5
   display h
   h = h + 1
   end while

(C) for k = 7 down to 4 step −1
   display k

(D) f = 6
   while f < 3
   display f
   f = f − 1

54. The representation of the pseudocode statement "Read number" in a flowchart symbol is

(A) Read number

(B) Read number

(C) Read number

(D) Read number
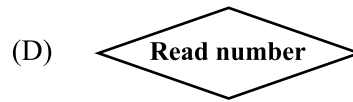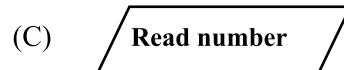
55. The term used to describe a memory location whose value changes during program execution is

(A) variable
(B) volatile
(C) constant
(D) dynamic

56. Which of the following are high-level languages?

I. Pascal
II. COBOL
III. ASSEMBLY

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

GO ON TO THE NEXT PAGE

57. Program implementation involves a number of steps. Which of the following steps is NOT legitimate?

(A)   Linking
(B)   Bonding
(C)   Executing
(D)   Compiling

58. Which of the following languages is only understood by computers?

(A)   4 GLs
(B)   Machine language
(C)   Natural language
(D)   Procedural language

59. Errors that occur in a program when the rules of the programming languages are NOT obeyed are called

(A)   syntax errors
(B)   logical errors
(C)   run-time errors
(D)   execution errors

60. Which of the following is an example of a conditional construct?

(A)   For – Next
(B)   For – endfor
(C)   If – then– else
(D)   While – endwhile

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.

DO NOT WRITE ON THIS PAGE

DO NOT WRITE ON THIS PAGE

CANDIDATE'S   RECEIPT

INSTRUCTIONS TO CANDIDATE:

1.   **Fill in all the information requested clearly in capital letters.**

TEST CODE: | 0 | 1 | 2 | 2 | 9 | 0 | 1 | 0 |

SUBJECT: INFORMATION TECHNOLOGY − Paper 01

PROFICIENCY: GENERAL

REGISTRATION NUMBER:

FULL NAME: _____
                          (BLOCK LETTERS)

Signature: _____

Date: _____

2.   **Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.**

3.   **Keep it in a safe place until you have received your results.**

INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet collected by you.

I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: _____
                       Supervisor/Invigilator

Date: _____

Question	Key	Syllabus Objective	Profile	Question	Key	Syllabus Objective	Profile
1	C	1.4	P1	31	D	3.5	P1
2	B	1.2	P1	32	D	3.5	P1
3	C	1.3	P1	33	A	3.2	P1
4	A	1.5	P1	34	C	3.6	P1
5	C	1.3	P1	35	B	3.6	P1
6	C	1.2	P1	36	D	4.3	P2
7	B	1.6	P1	37	A	4.7	P2
8	A	1.6	P1	38	D	4.9	P2
9	B	1.6	P1	39	B	4.12	P2
10	D	1.9	P1	40	C	4.11	P2
11	D	1.9	P1	41	A	5.2	P2
12	C	1.7	P1	42	D	5.7	P2
13	B	1.8	P1	43	D	5.6	P2
14	B	1.10	P1	44	D	5.2	P2
15	C	1.8	P1	45	C	5.1	P2
16	A	1.11	P1	46	C	6.2	P2
17	C	1.13	P1	47	D	6.2	P2
18	C	1.4	P1	48	A	6.4	P2
19	C	1.14	P1	49	B	6.2	P2
20	B	1.11	P1	50	A	6.2	P2
21	B	2.1	P1	51	A	7.1	P3
22	A	2.4	P1	52	C	7.8	P3
23	D	2.4	P1	53	D	7.8	P3
24	A	2.2	P1	54	C	7.6	P3
25	A	2.3	P1	55	C	7.4	P3
26	A	3.2	P1	56	D	8.3	P3
27	B	3.1	P1	57	B	8.2	P3
28	C	3.2	P1	58	B	8.1	P3
29	C	3.3	P1	59	A	8.3	P3
30	B	3.3	P1	60	B	8.5	P3

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SPECIMEN PAPER

FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE

0	1	2	2	9	0	2	0

SUBJECT   INFORMATION TECHNOLOGY – Paper 02

PROFICIENCY   GENERAL

REGISTRATION NUMBER

SCHOOL/CENTRE NUMBER					

NAME OF SCHOOL/CENTRE

CANDIDATE'S FULL NAME (FIRST, MIDDLE, LAST)

DATE OF BIRTH

D	D	M	M	Y	Y	Y	Y

SIGNATURE _____

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C A R I B B E A N   E X A M I N A T I O N S   C O U N C I L

**CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION**

INFORMATION TECHNOLOGY

Paper 02 – General Proficiency

2 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of FOUR questions. Answer ALL questions.

2. Write your answers in the spaces provided in this booklet.

3. Do NOT write in the margins.

4. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**

5. **If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

"*"Barcode Area"*"
Sequential Bar Code

Answer ALL questions.

1. Elaine wants to place her gluten-free recipes on the Internet and access them using a web address. She wants users to register in order to access her recipes and plans to store their information in an online database. She also needs to manage any emails and interact with her online clients when new recipes are uploaded.

   (a) State the name of the computer-related professional that would be most suitable for

   placing her recipes on the Internet

   ....

   managing her emails and online clients.

   ....
   (2 marks)

   (b) Describe TWO tasks of EACH of the professionals in Part (a).

   ....

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   ....
   (2 marks)

   (c) Elaine soon receives hundreds of emails with strange email addresses and other requests to visit other websites. Explain two security practices that she should consider before responding to these emails.

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   (4 marks)

"*"Barcode Area"*"
Sequential Bar Code

(d) Describe two measures that can be used to prevent against software attacks on Elaine's website.

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(2 marks)

(e) Users' data are stored in an online database. Apart from first and last name, list two fields that should be used to capture data on users who register for Elaine's recipes.

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(2 marks)

(f) Elaine wants to extract some information from the database. Complete the table by selecting the most suitable database feature from the list below.

Calculated Field	Form	Query	Report	Sort

Task	Database Feature
The list of users who have accessed her cupcake recipe	
How many users have registered	
An overview of the number of users who requested each recipe	
A list of the users by country but in ascending order	

(4 marks)

"*"Barcode Area"*"
Sequential Bar Code

(g) A user searches for Elaine's recipes and locates the following layout:
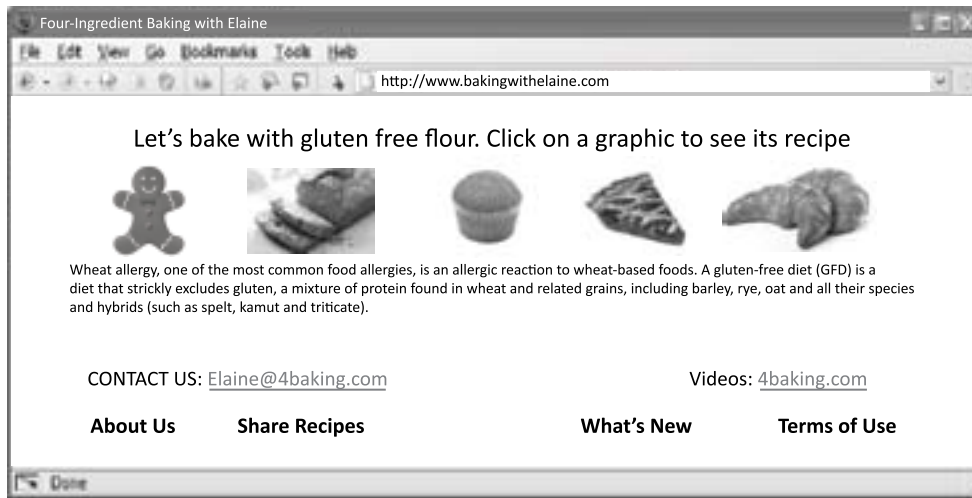
Use the layout above to state

the general name given to this type of page

....

....

a web address

....

....

an email address

....

....

a hyperlink

....

....

(4 marks)

Total 20 marks

GO ON TO THE NEXT PAGE

"*"Barcode Area"*"
Sequential Bar Code

2. John Taylor is the systems administrator at St Joseph's High School. He has been asked by the principal to prepare a report that will show the requirements for the computers and other equipment to be purchased for a new computer lab.

(a) List ANY FOUR of the major components that each computer system should have.

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(2 marks)

(b) State the function of ANY ONE of the major components of a computer system.

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(1 mark)

(c) John intends to create a network that spans the computer lab. State the name of the type of network that he needs to create.

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(1 mark)

"*"Barcode Area"*"
Sequential Bar Code

(d)   In preparing his report, John uses the Internet to assist him in finding the specifications of computers best suited for the computer lab.

Discuss ANY TWO approaches he could use to evaluate the reliability of the information he retrieves.

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(6 marks)

"*"Barcode Area"*"
Sequential Bar Code

The required report must include a well-organized spreadsheet outlining all the needs of the lab, and the expected costs in terms of equipment. The incomplete spreadsheet is shown below.

	A	B	C	D
1	*Expected Costs for New Computer Lab*			
2	**Description Item**	**Units**	**Cost per Unit**	**Total**
3	Student computer	30	$ 5 , 000.00	
4	Computer Table	30	$ 800.00	
5	Teacher Computer	1	$ 5,500.00	
6	Teacher Table	1	$ 750.00	
7	Student Chairs	30	$ 500.00	
8	Teacher Chairs	1	$ 650.00	
9	20ft UTP Cabling	15	$ 80.00	
10	Projector	1	$ 3,000.00	
11	Screen	1	$ 2,400.00	
12	White board	2	$ 380.00	
13	**TOTAL Expected Costs**			
14				
15	Average Item Cost			

(e)   Cell A1 is formatted across the columns for effective presentation.

(i)   State the name of the formatting feature used to achieve this.

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(2 marks)

(ii)   Write the text for the formula to be inserted in D3 to calculate the TOTAL cost for student computers.

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(2 marks)

"*"Barcode Area"*"
Sequential Bar Code

(iii)   Write the text for the function to be inserted in D13 to calculate the TOTAL expected costs.

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(2 marks)

(iv)   Write a function that would insert the average cost per unit of an item in cell B15.

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(2 marks)

(v)   John decides that he wants the rows reorganized so that they are in order of the most expensive to the least expensive.

Explain how he could do this using features of the spreadsheet software.

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(2 marks)

Total 20 marks

"*"Barcode Area"*"
Sequential Bar Code

3. Kara wants to buy a $350.00 costume for the upcoming carnival. She decides to sell some cakes in order to raise the funds for the costume.

(a) (i) Kara's friend ordered some cakes. Write an algorithm using pseudocode to prompt for the quantity of cakes ordered, then calculate and output the total, if the price for each cake is $5.00.

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(6 marks)

(ii) Kara sold 25 cakes at $5.00 each. Explain how Kara would determine whether she has raised enough funds to purchase her costume.

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(4 marks)

GO ON TO THE NEXT PAGE

"*"Barcode Area"*"
Sequential Bar Code
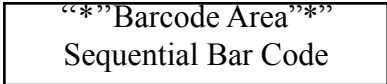
(b) Kara wants to create the spreadsheet shown below to track the orders placed for the items.

	A	B	C	D	E	F
1						**Cost of Costume**
2						$350.00
3	**Date**	**Item**	**Cost**	**Quantity Ordered**	**Total Due**	
4	11 July	Chocolate cake	$20.00	6	$120.00	
5	11 July	Sponge cake	$20.00	5	$100.00	
6	14 July	Swirl cake	$20.00	2	$40.00	
7	17 July	Cupcakes cake	$20.00	12	$240.00	
8						
9						
10						

(i) Using the spreadsheet above, write the functions and/or formulas in cell E8 or E9 to illustrate whether Kara has raised enough funds.

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(6 marks)

(ii) Write the function that would be entered in cell E10 to output 'Yes' if Kara would be able to purchase the costume, or 'No' if she has not raised enough funds.

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(3 marks)

(iii) Kara wants to insert another order for 10 July, in row 4. Explain what would happen to the data in row 4.

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(1 mark)

"*"Barcode Area"*"
Sequential Bar Code

(c)　Kara does not want others to see her sales from the cakes. Explain how she could protect her spreadsheet.

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(1 mark)

(d)　Kara is now very interested in learning more about spreadsheets. The courses that she prefers are offered during the day. Since she works during the day, she cannot register for them.

Suggest, with reasons, two other options that Kara could consider in order to take a similar course.

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(4 marks)

Total 25 marks

"*"Barcode Area"*"
Sequential Bar Code

4. (a) A local area network may be wired or wireless. Jennifer has a small apartment and has decided to set up a network that will connect all the devices in her home that she uses frequently. These devices are

- 1 desktop computer
- 1 laptop computer
- 1 android cellphone
- 1 android tablet
- 1 printer.

Draw lines that correctly map the devices on the left side of the table to the explanation on the right side of the table.

Router	Used to send messages to the right computer on a single network
Modem	Used when we two different networks need to be connected
Switch	Type of wired transmission media which is used on local area networks
Twisted Pair	Converts analogue signals to digital and digital signals to analogue
Network Interface Card	Prepares data, sends data, receives data, and controls data flow between a computer and the network to which it is connected

(5 marks)

"*"Barcode Area"*"
Sequential Bar Code

(b) Explain ONE advantage and ONE disadvantage of using a wireless network over a wired network.

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(4 marks)

(c) State the name of the protocol (technology) most commonly used to provide wireless computer networking in a home or office.

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(1 mark)

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"*"Barcode Area"*"
Sequential Bar Code

(d) Algorithms are used to express the steps required to solve a problem. Write an algorithm using simple pseudocode to do the following

- Prompt a user by displaying the following statement:

  Please enter positive integers one at a time and "−1" to indicate no further input.

- Accept the values from the user until −1 is entered

- Determine and display

  (i) the sum of the numbers

  (ii) the average of the numbers.

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(10 marks)

GO ON TO THE NEXT PAGE

"*"Barcode Area"*"
Sequential Bar Code

(e) Study the following pseudocode.

```
Begin
  Declare selected, number, count
  count = 0
  print "enter your integers"
  read number
  selected = number
  while (count < 10)
    if(number < selected)
        selected = number
    count = count+1
    read number
  end while
  print selection
End
```

State the problem the algorithm solves and explain how it solves it.

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(5 marks)

Total 25 marks

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.

GO ON TO THE NEXT PAGE

EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided.

Question No. [ ]

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"*"Barcode Area"*"
Sequential Bar Code

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CANDIDATE'S   RECEIPT

INSTRUCTIONS TO CANDIDATE:

1. **Fill in all the information requested clearly in capital letters.**

    TEST CODE: | 0 | 1 | 2 | 2 | 9 | 0 | 2 | 0 |

    SUBJECT: _____INFORMATION TECHNOLOGY – Paper 02_____

    PROFICIENCY: _____GENERAL_____

    REGISTRATION NUMBER: | | | | | | | | | | |

    FULL NAME: _____

    (BLOCK LETTERS)

    Signature: _____

    Date: _____

2. **Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.**

3. **Keep it in a safe place until you have received your results.**

INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet collected by you.

I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: _____
                Supervisor/Invigilator

Date: _____

C A R I B B E A N   E X A M I N A T I O N S   C O U N C I L

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION

INFORMATION TECHNOLOGY

Paper 02 – GENERAL PROFICIENCY

KEY AND MARK SCHEME

SPECIMEN PAPER

2017

Information Technology
Paper 02 – General Proficiency
Key and Mark Scheme
SPECIMEN PAPER

SECTION I

SO	Question	Key	Mark
	1.		
(3:5)	(a)	Web developer Social media specialist	2
(3:5)	(b)	Any TWO of: Builds/creates/updates websites; oversees development of website; publishes the website	2
(3:3)	(c)	Any Two explanations: (Similar/suitable responses are acceptable) • Verify the authenticity of the email, • Verify whether the emails are spam • don't click on the website links if she is unsure	4
(3:3)	(d)	Any TWO of: a firewall or antivirus or malware detection to prevent viruses or malicious attacks (3:3)	2
6:3	(e)	Any TWO of: • email address • types of recipes user requests • country • username (Similar/suitable responses are acceptable)	2
6:4	(f)	Query Calculated field Report Sort (ed query)	4
4.11	(g)	Home page or webpage http://www.bakingwithelaine.com or 4baking.com Elaine@4baking.com Back to top, link for each baking item, email address, and video (4baking.com)	4
		TOTAL	20

Information Technology
Paper 02 – General Proficiency
Key and Mark Scheme
SPECIMEN PAPER

SO	Question		Key	Mark
	2.			
	(a)		• Input Device(s), Central Processing Unit/CPU, Memory, Secondary Storage, Output Device(s) ANY 4 correct [2 marks] ANY 2 or 3 correct [1 mark] 1 or 0 correct [0 marks]	2
	(b)		• Input Device(s) are computer system components that feed data into a computer; CPU or Central Processing Unit - is the hardware device in a computer that executes all the instructions from the software; Secondary Storage Devices – refers to non-volatile storage devices, such as hard disk drives; Output Devices – refers to peripheral devices that allow processed information or result to be converted into a format that is available outside of the computer system. Any one correctly explained [1 mark]	1
	(c)		Local Area Network [1 mark]	1
	(d)		• He could check the currency **[1]** of the information by looking at the date **[1]** of the article/information to ensure that the information is not so old that it is no longer useful [1]; he could check for biases **[1]** – he may need to look for objective sources **[1]** to get information on product quality as a seller may provide exaggerated views of the product quality **[1]**; He could check to ensure that the information is relevant [1] by checking to see if information on prices, technical specifications and delivery etc. are applicable to the region in which the school is located. **[1]** ANY 2 reliability tests and correct discussion (3 marks each as shown)	6
	(e)	(i)	Merge **[1]** and center **[1]**	2
		(ii)	=B4*C4 1 mark Correct cells 1 mark for *	2
		(iii)	=Sum(D4:D13)) *[1 for correct function and 1 for correct parameter in the function]*	2

Information Technology
Paper 02 – General Proficiency
Key and Mark Scheme
SPECIMEN PAPER

SO	Question	Key	Mark
	2. cont'd		
	(iv)	=Average(C4:C13) *[1 for correct function and 1 for correct parameter in the function]*	**2**
	(v)	Sort the items by column C – Cost Per Unit **[1]** in descending order **[1]**	**2**
		TOTAL	**20**

Information Technology
Paper 02 – General Proficiency
Key and Mark Scheme
SPECIMEN PAPER

SO	Question		Key	Mark
	3.			
7.6	(a)	(i)		6

Algorithm	Comment	Marks
Price = 5.00	Declarations and initialisation	1 mark
Prompt "Enter Quantity"	Prompt	1 mark
Accept Quantity	Input data	1 mark
TotalDue = Quantity * Price	Correct calculation of total due Error in calculation -1	2 marks
Print TotalDue	Output result	1 mark

7.2	(ii)		4

Algorithm	Comment	Marks
Sum (or total) the amount of money for all sales;	Calculation of sales	(1 mark)
Then find the difference: 350 - total sales	Finding difference	(1 mark)
If the total due is equal to or greater than 350, Then she has raised enough funds.	Determine whether enough funds were raised	(2 marks)

Information Technology
Paper 02 – General Proficiency
Key and Mark Scheme
SPECIMEN PAPER

SO	Question	Key	Mark
	3. cont'd		
	(b) (i)		**6**

Cell **E8**: =SUM(E4:E7) OR =SUM(E4..E7) OR =E4+E5+E6+E7	Correct SUM function: Correct Range: Correct brackets **and** equal sign **and** (colon or two dots):	1 mark 1 mark 1 mark
5.4 Cell **E9** Possible options to calculate the difference: =F2-E8 OR =F2-E8	Both cell references correct Equal sign Minus sign	1 mark 1 mark 1 mark

5.3	(ii)		3

=IF(E9>F2,"Yes","No") OR =IF(E9>0,"No","Yes")	=IF Condition Y/N Options	1 mark 1 mark 1 mark

Information Technology
Paper 02 – General Proficiency
Key and Mark Scheme
SPECIMEN PAPER

SO	Question	Key	Mark
	3. cont'd		
5.6	(iii)		**1**

5.6 Data in row 4 would <u>move to row 5</u> Or is pushed <u>down by one row</u>	Explanation showing that data is row 4 becomes data in row 5	1 mark

(c)	3.3			**1**	

She could <u>encrypt</u> her file or use a <u>password</u> to protect it	Encrypt or Password (other suitable/appropriate responses can be accepted)	1 mark

(d)	3.6			**4**	

<u>Any two:</u> <u>Access to information:</u> Purchase a book and learn on her own Watch you tube videos Access information on the Internet Online learning (class) Online tutoring	<u>Suitable reasons</u>: E.g. Level of knowledge could determine if she wants to learn on her own (book, watch videos) Or prefer an online class /tutor	<u>Two options</u> (1 mark each) = 2 marks <u>Suitable reason for each option</u> (1 mark each) = 2 marks

			TOTAL	15

Information Technology
Paper 02 – General Proficiency
Key and Mark Scheme
SPECIMEN PAPER

SO	Question	Key	Mark
	4.		
1.9	(a)	<table><tr><td>Switch</td><td>Used to send messages to the right computer on a single network</td></tr><tr><td>Router</td><td>Used when we wish to connect two different networks together</td></tr><tr><td>Twisted Pair</td><td>Type of wired transmission media which is used on local area networks</td></tr><tr><td>Modem</td><td>Converts analogue signals to digital and digital signals to analogue</td></tr><tr><td>Network Interface Card</td><td>Prepares data, sends data, receives data, and controls data flow between a computer and the network to which it is connected</td></tr></table>	5
	(b)	Advantage – reducing clutter by reducing wires; allowing her to print from anywhere in her home rather than needing to take the device and connect it to her printer; easier installation of new devices (provided they are wireless compatible); allowing her to print from the mobile phone and tablet which would not have traditional printing ports etc. [2 marks for identifying and explaining ANY ONE advantage] Disadvantages – Can require greater care in relation to security as the transmission media lends itself more easily to interception; Some persons have concerns related to their health and wireless signals in their homes.[2 marks for identifying and explaining ANY ONE disadvantage]	4
	(c)	WiFi	1

Information Technology
Paper 02 – General Proficiency
Key and Mark Scheme
SPECIMEN PAPER

SO	Question	Key	Mark
	4. cont'd		

	(d)	Begin
		      Declare number, sum, average, count [1]
		    count=0
		    sum=0
		    print "Please enter…."
		    read number
		    while(number!=-1)
		      sum=sum+number
		      count=count + 1
		      read number
		    end while
		    count=count+1
		    read number
		    end while
		    print "sum=", sum
		    print "average=" sum/count
		      End
		
		Declare appropriate variable [1 mark]
		Initialise the variable [1 mark]
		Read first value [1 mark]
		Loop control condition [2 marks]
		Statements in loop [3 marks]
		Print Sum [1 mark]
		Print Average [1 mark]
			10

	(e)	The algorithm <u>allows the user to enter 10 numbers</u> **[1]** after which <u>it displays the smallest of the numbers entered</u> **[1]** **(2 marks)** It does this by <u>checking each number entered to see if it is smaller that the smallest number received thus far.</u> **[1]** If it is, <u>then that number is recorded as the smallest number by storing it in the variable selected.</u> **[1]** When the program exits the loop <u>any value stored in the variable selected will be the smallest</u> **[1]** – so it is displayed using the print statement. **(3 marks)**	5
		TOTAL	25

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SPECIMEN PAPER

FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE | 0 | 1 | 2 | 2 | 9 | 0 | 3 | 2 |

SUBJECT _____INFORMATION TECHNOLOGY – Paper 032_____

PROFICIENCY _____GENERAL_____

REGISTRATION NUMBER

SCHOOL/CENTRE NUMBER

NAME OF SCHOOL/CENTRE

CANDIDATE'S FULL NAME (FIRST, MIDDLE, LAST)

DATE OF BIRTH | D | D | M | M | Y | Y | Y | Y |

SIGNATURE _____

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C A R I B B E A N   E X A M I N A T I O N S   C O U N C I L

**CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION**

INFORMATION TECHNOLOGY

Paper 032 – General Proficiency

ALTERNATIVE TO SCHOOL-BASED ASSESSMENT

2 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of FIVE questions. Answer ALL questions.

2. Write your answers in the spaces provided.

3. Do NOT write in the margins.

4. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**

5. **If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

6. Please remember to save your work done on the computer frequently.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

"*"Barcode Area"*"
Sequential Bar Code

Answer ALL questions.

1.   **WORD PROCESSING**

Below is a sample letter which is to be sent to customers of Cars Inc. As the secretary of the organization, you are to prepare ten letters for appropriate customers using mail merge.

<div style="border:1px solid">

Cars Inc

May 18, 2017

<Title> <first name> <last name>

<Position>

<Company>

<Address>

Dear <title> <last name>,

We are writing you this letter reminding you of your outstanding balance of <amount> which has been due for over <period>. As a result, if this payment is not made within 30 days, we will then be forced to take legal action.

Thanks for your co-operation.

Sincerely,

Peter King

Sales Manager

Making a world of difference

</div>

(a)   Type the letter indicated above as your primary document.
       Save as Cars1

                                                                             (1 mark)

(b)   Insert an appropriate logo into the header and add ONE other feature to the letter.
       Save as Cars2

                                                                             (2 marks)

(c)   Populate the letter by including merge fields for the ten customers.
       Save as Cars3

                                                                             (5 marks)

(d)   Merge the documents.
       Save as Cars4

                                                                             (1 mark)

(e)   Protect the merged document by restricting editing.
       Save as CarsInc   **(1 mark)**

                                                                  Total 20 marks

GO ON TO THE NEXT PAGE

"*"Barcode Area"*"
Sequential Bar Code

2. SPREADSHEET

(a) Retrieve the workbook DELEARSHIP, and perform the following tasks on the STOCK worksheet. The data should reflect what is shown below.

	A	B	C	D	E
1	**MANUFACTURER**	**OPENING STOCK**	**CLOSING STOCK**	**PRICE**	**REVENUE FROM SALES**
2	NISSAN	5	3	85 000	
3	TOYOTA	5	4	100 000	
4	MITSUBISHI	5	1	90 000	
5	MAZDA	5	5	75 000	
6	SUZUKI	5	2	55 000	
7					
8					
9					

(i) Format the labels in row 1 to Arial font, bold, 12 point, and centre the data in the cells horizontally and vertically.

(2 marks)

(ii) Insert a formula in cell E2 to calculate the REVENUE FROM SALES for cars from the Nissan Manufacturer, and **replicate** your formula in cells E3:E6.

(2 marks)

(iii) In the range A8:A9, enter the following text:

TOTAL REVENUE
AVERAGE REVENUE

Then insert appropriate functions in range B8:B9 which will compute the total and average revenue from the sales of all vehicles.

(2 marks)

(iv) Apply currency and two decimal places to the data in cells D2:E6.

(1 mark)

GO ON TO THE NEXT PAGE

"*"Barcode Area"*"
Sequential Bar Code

(b) Retrieve the worksheet SALES, copy of the worksheet is provided below, and perform the following tasks.

SALES

	A	B
1	**2018 Revenue**	
2	**QUARTER**	**REVENUE ($)**
3	Quarter 1	1 155 000.00
4	Quarter 2	925 000.00
5	Quarter 3	1 290 000.00
6	Quarter 4	

(i) Link the missing value in cell B6 with cell B8 from the STOCK sheet in the DEALERSHIP workbook to complete the 2018 Revenue.

(1 mark)

(ii) Filter the REVENUE data for the quarters where the revenue was less than $1 000 000.00. Set up the extraction range in a blank area of the STOCK sheet in the DEALERSHIP workbook.

**Save your workbook with the filename
DEALERSHIPCANDIDATENUMBER** **(2 marks)**

Total 20 marks

"*"Barcode Area"*"
Sequential Bar Code

3.   DATABASE

(a)   The following questions relate to database management.

The owner of a car dealership uses a stock card system to record the details of vehicles in his inventory. A sample stock card is shown below.

Make	**Model**	**Registration Number**	**Colour**
Audi	A4	PCE 427	Silver
Audi	S4	PCS 4	White
BMW	X3	PBH 2340	Red
BMW	X5	PCY 888	Blue
Mercedes	C180	PBB 3962	Green
Mercedes	E200	PBR 4747	Black
Mercedes	E200	PCT 6531	Gold
Mercedes	S500	PDM 1	Black

Design the structure of a database table to correspond to the stock card. Your table structure should include appropriate field names, data types and field sizes.

(3 marks)

(b)   Which field in the table is the MOST appropriate to use as a key field?

....

(1 mark)

(c)   Suggest ONE additional field which could be added to the table.

....

(1 mark)

(d)   Suggest ONE database feature that can be used by the dealer to simplify the entry of new vehicles and their details into his inventory.

....

(1 mark)

(e)   Describe ONE validation check that could be used on the Registration Numbers as they are entered.

....

....

(1 mark)

GO ON TO THE NEXT PAGE

"*"Barcode Area"*"
Sequential Bar Code

(f) Identify the database feature that could be used to arrange the registration number of vehicles in ASCENDING order.

....

(1 mark)

(g) The report below is to be generated from your database.

Make	Model	Registration Number	Colour
Audi	A4	PCE 427	Silver
Audi	S4	PCS 4	White
BMW	X3	PBH 2340	Red
BMW	X5	PCY 888	Blue
Mercedes	C180	PBB 3962	Green
Mercedes	E200	PBR 4747	Black
Mercedes	E200	PCT 6531	Gold
Mercedes	S500	PDM 1	Black

Generate this report and save your database.

(2 marks)

**Save your database with the filename
DEALERSHIPCANDIDATENUMBER**: cars(candidate#) eg. cars(12345667).

Total 20 marks

4. WEBPAGE DESIGN

Amery created a website for his small photography business and was eager to have it published. However, he was told that he should consider completing some checks before doing so.

(a) Insert 1st, 2nd and 3rd in the following table to indicate the order in which the activities must be completed.

Activity	Rank
Use a test audience.	
Maintain a website.	
Verify that all the hyperlinks work correctly.	

(3 marks)

(b) Give ONE example of a hyperlink that could be used on the webpage. Explain its purpose.

....

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(2 marks)
Total 5 Marks

GO ON TO THE NEXT PAGE

"*"Barcode Area"*"
Sequential Bar Code

5. PROBLEM-SOLVING AND PROGRAMMING

Mr Smith is the CEO of Techno Store, which is a local distributor for computers and other electronic devices. He has solicited your help to make his business efficient.

Using pseudocode, write an algorithm to

1. accept the name and cost for EACH type of device
2. ask the user if the item is taxable or non-taxable
3. calculate VAT of 16% using conditional branching
4. calculate the total cost of the item after adding VAT
5. output the name and total cost for the device

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Total 15 Marks

END OF TEST

"*"Barcode Area"*"
Sequential Bar Code

EXTRA SPACE

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Question No. [ ]

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C A R I B B E A N   E X A M I N A T I O N S   C O U N C I L

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®

INFORMATION TECHNOLOGY

PAPER 032

MARK SCHEME

SPECIMEN

C A R I B B E A N   E X A M I N A T I O N S   C O U N C I L

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INFORMATION TECHNOLOGY
PAPER 032
MARK SCHEME

1. **Specific Objectives:**

   a)   1 mark for typing the letter accurately

                         1 mark

   b)   1 mark for the logo placed in the header

          1 mark for use of another formatting feature.

                         2 marks

   c)   1 mark for every *two* field names entered correctly.
          (There are 10 fields to be entered)

                         5 marks

   d)   1 mark for merging the documents.

                         1 mark

   e)   1 mark for use of protection feature.

                         1 mark

                         Total 10 marks

2. **Specific Objectives:**

   a) (i)   Arial font, Np;d, 12 pt - 1 mark

             Centre - 1 mark

                         2 marks

     (ii) $= (B2 - C2) * D2$ 1 mark

             Replication - 1 mark   **2 marks**

     (iii) Next to total revenue: = sum(E2:E6)

             Next to Average Revenue: = avg(E2:E6) or =(A8/5)

                         2 marks

     (iv) All cells with currency format - 1 mark

                         1 mark

   (b) (i) Links data correctly - 1 mark

                         1 mark

     (ii) Filter correctly applied - 1 mark

             Extraction range setup correctly - 1 mark

                         2 marks

                         Total 10 marks

INFORMATION TECHNOLOGY
PAPER 032
MARK SCHEME

3.   **Specific Objectives:**

a)   Correct field names [1], data types [1} and field
sizes [1]

3 marks

b)   Make   **1 mark**

c)   Any appropriate field eg. Year   **1 mark**

d)   Any appropriate feature   **1 mark**

e)   Eg. Must start with the letter 'P'   **1 mark**

f)   Sort   **1 mark**

g)   Data sorted [1 mark]

Data grouped [1 mark]

No report - award no marks   **2 marks**

Total   10 marks

4.   **Specific Objectives**: 4.11, 4.12

a)

Item	Rank
Use a test audience.	2
Maintain a website	3
Verify that all the hyperlinks work correctly.	*1*

3 marks

INFORMATION TECHNOLOGY
PAPER 032
MARK SCHEME

b)

One Example (1 mark)	Explanation (1 mark)
Http://www.anotherlink.com	Link to another web page.
BacktoTop	Link to a location within the webpage.
EmailUs or MailTo: specimen@cxc.org	Link to an email address.
Download Here	Link to user-created files.

2 marks

Total 5 marks

5.   **Specific objectives:**

Key 1 – Using REPEAT Loop

Header: Techno_Store   appropriate heading   (1)

Declaration: The purpose of this algorithm is to output the name and total cost for a device.   Declaration   (1)

Constant

     Vatpercent = 0.16   Use of constant (1)

Variables

Name1, answer of string   Use of datatypes - three or more (2)

Cost, total_cost, vat of real

Response of char

Body

Step 1: Start   (1)

Step 2: Repeat   (appropriate use of iteration (1)

Step 3: Print (Enter the name of device)

                              use of Output statement (1)

INFORMATION TECHNOLOGY
PAPER 032
MARK SCHEME

Step3: Read name1   use of Input statement (1)

Step 4: Print(Enter the cost of, name1)

Step 5: Read cost

Step 6: Print (Enter "Y" if item is taxable or "N" if it is non-taxable)

Step 7: Read Response

Step 8: If (Response = "Y")then   (use conditional branching

            1 mark for If-then and 2 marks for If-then-else)2mks

Set vat ◄─────── Vatpercent * cost

        Else

                Set vat ◄─────── 0

        Endif

Step 9: set total_cost   ◄─────── vat + price

            1 mark for assignment variable and 1 for correct variables used

Step 10: Print (The total cost for a , name1 , is, total_cost)

            1 mark for each output (2 marks)

Step 11: Print (Do you have another item?)

Step 12: Read Answer

Step 13: Until (answer = "No")

Step 14: Stop   Terminator 1 mark

Key 2 – Using FOR Loop

Header: Techno_Store   appropriate heading   (1)

Declaration: The purpose of this algorithm is to output the name and total cost for a device.   (1)

Constant

            Vatpercent = 0.16   Use of constant (1)

Variables:

Name1, of string   Use of datatypes - three or more (2)

Cost, total_cost, vat of real

Response of char

Num of integer

INFORMATION TECHNOLOGY
PAPER 032
MARK SCHEME

Body:

Step 1: Start   (1)

Step 2 : Print (how many items did you purchase?)

Step 3: Read num

Step 4: For I = 1 to num do   appropriate use of iteration (1)

Step 4i:Print (Enter the name of device)   use of Output statement (1)

Step4ii: Read name1   use of Input statement (1)

Step 4iv: Print(Enter the cost of, name1)

Step 4v: Read cost

Step 4vi: Print (Enter "Y" if item is taxable or "N" if it is non-taxable)

Step 4vii: Read Response

Step 4viii: If (Response = "Y")then

(use conditional branching - 1 for If-then and 2 for If-then-else)2mks

            Set vat   ◄——————   Vatpercent * cost

        Else

            Set vat   ◄——————   0

        Endif

Step 4ix: set total_cost   ◄——————   vat + price

    (1 for assignment variable and 1 for correct variables)

Step 4x: Print (The total cost for a , name1 , is, total_cost)
    (Output results 1 mark for each output) 2 marks

Step 4xi: Endfor

Step 5: Stop   Terminator (1)

Key 3 – Using WHILE Loop

Header: Techno_Store   appropriate Heading   (1)

Declaration: The purpose of this algorithm is to output the name and total cost for a device.   (1)

Constant

        Vatpercent = 0.16   Use of constant (1)

Variables:

Name1, of string   Use of datatypes - three or more (2)

Cost, total_cost, vat of real

INFORMATION TECHNOLOGY
PAPER 032
MARK SCHEME

Response of char

Num, count of integer

Body:

Step 1: Start   (1)

Step 2 : Print (how many items did you purchase?)

Step 3: Read num

Step 4: While count<=num do   appropriate use of iteration (1)

Step 4i: Print (Enter the name of device)   Output statement (1)

Step4ii: Read name1   Input statement (1)

Step 4iv: Print(Enter the cost of, name1)

Step 4v: Read cost

Step 4vi: Print (Enter "Y" if item is taxable or "N" if it is non-taxable)

Step 4vii: Read Response

Step 4viii: If (Response = "Y")then

       (use conditional branching - 1 for If-then and 2 for If-then-else)

                    Set vat ◄———   Vatpercent * cost

          Else

              Set vat ◄——— 0

          Endif

Step 4ix: set total_cost ◄——— vat + price calculation

     (1 for assignment variable and 1 for correct variables used)

Step 4x: Print (The total cost for a , name1 , is, total_cost)

      (1 mark for each output) 2 marks

Step xi   Count ◄———   count +1

Step 4xii: Endwhile

Step 5: Stop   Terminator (1)

                                    Total 15 marks