

G12 ECZ COMPUTER STUDIES P1 2017 SOLUTIONS

Grade 12 ECZ Computer Studies Paper 1, 2017 (7010/1)

2 hours 30 minutes | 13 Qs (12 Section A + 1 Section B), 70 marks

The full question paper appears first — worked answers follow.

Candidate Name _____

Centre Number			Candidate Number				

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Computer Studies

7010/1

Paper 1

Tuesday

14 NOVEMBER 2017

Candidates answer on the question paper
No additional materials are required

Time: 2 hours 30 minutes

Instructions to Candidates

- 1 Write your **name**, **centre number** and **candidate number** in the spaces at the top of this page.
- 2 There are 13 questions in this paper, 12 in Section **A** and 1 in Section **B**. Answer **all** questions.
- 3 Write your answers in the **spaces** on the question paper.

Information For Candidates

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 70.

Cell phones are not allowed in the Examination Room.

For Examiner's Use	
Section A	
Section B	
Total	www.zedpastpapers.com

Section A

1 (a) What computer term do we use to refer to organised facts?

.....
..... [1]

(b) Give **one** advantage of soft copy.

.....
..... [1]

(c) Which portable device can be used to read soft copy?

.....
..... [1]

2 A biometric security system has been installed at a bank.

(a) Name the part of the human body apart from eyes, which the system can use to identify a person.

..... [1]

(b) Give **one** disadvantage of biometric input.

.....
..... [1]

(c) Describe **one** other automated security method that can be used at the bank.

.....
..... [2]

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- 3 Masomo School has computerised its library which uses barcodes and a relational database.

(a) Explain what is meant by a relational database.

.....
 [2]

(b) Name the device that would be used to read barcodes and **one** item in the library that can use barcodes.

Device [1]

Item [1]

(c) Each member's record has a unique number. Give **one** use of this number in the database.

.....
 [1]

- 4 (a) State the difference between octal and hexadecimal number system.

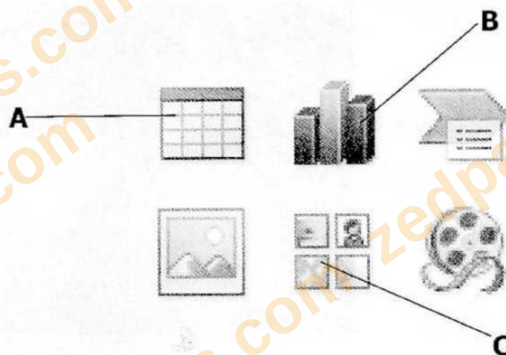
.....
 [1]

(b) Which number can the computer pick as greater, between 1100 (Octal) and IED (hexadecimal). Show your working.

.....

..... www.zedpastpapers.com
 [3]

- 5 The diagram below shows a screen from a Presentation package. Study it and answer the questions that follow.



- (a) State the names of the frames marked by **A** and **B**.

A [1]

B [1]

- (b) State the use of frame **C**.

..... [1]

- (c) State **one** device apart from a computer that is required to run a presentation.

..... [1]

- (d) State **one** similarity between a Word Processor and a Desktop Publishing Package.

.....

..... [1]

- 6 **AND**, **NOT** and **OR** gates have been used in the following truth table. Complete the outputs indicated.

A	B	C	E = NOT C	F = A OR B	E AND F
1	0	1	0		
1	1	0	1		

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[4]

7 Two typical user interfaces are shown below.



1



2

(a) Explain the meaning of the term, user interface.

.....
 [2]

(b) Mention the mouse function not applied in interface 1, but possible in interface 2.

.....
 [1]

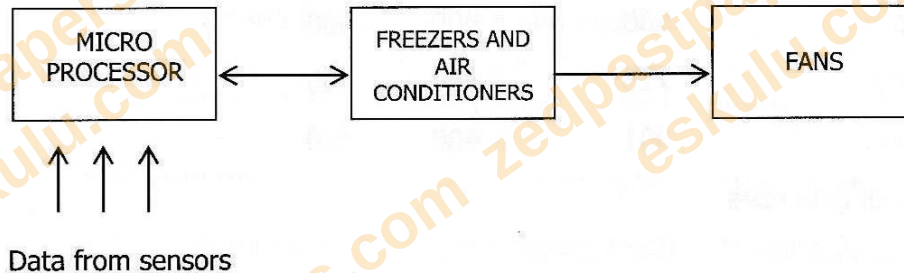
(c) State the application software that makes use of interface 1.

..... [1]

(d) State the system software that uses interface 2.

..... [1]

- 8 A modern meat storage cold room uses computer systems to control the freezing equipment. The cold room is equipped with sensors that monitor room conditions and feed data back to the micro processors.



- (a) Give **one** example of data captured from sensors in the cold room.

[1]

- (b) When loading and offloading the meat stocks, the freezers go off while the air conditioners come on. Explain how the system is able to do this automatically.

[2]

- (c) Give **one** reason why data is fed back to the micro processors from sensors.

[1]

- 9 Chinyemba runs a small business of sewing clothes. To keep a record of the cost of business, he uses a software package as shown below.

	Material	Wages	Rent	Tax	Total
April	830	1 400	400		
May	715	1 400	400		
June	901	1 400	400		
Total Expenses					

- (a) What software package is suitable for this record?

..... [1]

- (b) Each month, Chinyemba types in the cost of various items. Explain why he does not need to type in the total cost.

.....

 [1]

- (c) When "Total Expenses" was typed, it could not appear fully. What could be done so that it is fully displayed?

.....
 [1]

- (d) Explain how the amounts can be changed to show ngwees, that is 830.00.

.....
 [1]

10 Mwikisa runs a small trading business. He wants to change from a manual wages system to a computerised one.

- (a) Give **one** reason why it is important for him to undertake a feasibility study before considering the change to a new system.

.....
..... [1]

- (b) Give **one** advantage to Mwikisa of buying a software package instead of writing the program for calculating wages.

.....
.....
..... [1]

- (c) Mention **two** types of tests he can carry out to check if the system works well.

Type 1 [1]

Type 2 [1]

11 Most big organisations depend on large networks to run their businesses. One of their main concerns is data security.

- (a) Give a type of network on which security is critical.

..... [1]

- (b) Give **one** type of security threat common on networks.

.....
..... [1]

- (c) Give **one** advantage of a bus topology.

.....
..... www.zedpastpapers.com [1]

- 12** The following algorithm in pseudo code is used to calculate the area of a triangle, given base (b) and height (h).

START

Enter (b)

Enter (h)

IF (b < 0) or (h < 0) THEN

PRINT input error

ELSE

Calculate Area = $\frac{1}{2} * b * h$

Print Area

END IF

STOP



Rewrite the algorithm using a flow chart in the box on the right.

[4]

Section B

13 Read the following scenario carefully and use it to answer the questions that follow.

At Channa School, a charity has been formed for student donations and profits from school fundraising events. Each class competes to win the school charity shield for the most money collected in the year. The records for this are manually done.

When a student donation is recorded, the following details are always written in the class record book.

- Student name
- Date
- Class
- Amount of donation

When a profit from a fundraising event is recorded, the following details are written in the class record book.

- Event name
- Date
- Class
- Profit made

Description of current system

- Paper based
- donations recorded by each claim
- all class records recorded in school donations master file

(a) A Systems Analyst will take up the project to computerise this system. Give **two** tools he could use to check the progress on this project.

.....

.....

.....

.....

[2]

- (b) The analyst must study the existing recording system from the students who have used it. State **one** method that would **not** be suitable to study this system. Explain why the Systems Analyst should not choose that method.

Method: [1]

Explanation: [2]

- (c) In the choice of hardware to be used, the analyst has proposed that a laptop computer and smart phone be used to run the system.

(i) Give **one** use of the laptop for this system. [1]

(ii) Give **one** use of the smartphone for this system. [1]

- (d) State what you would use the following symbols for in the project.



A



B



C

A [1]

B [1]

C [1]

- (e) If the two sets of details are used to create databases, which **two** fields can be used to link the two databases?

Field name 1 [1]

Field name 2 [1]

- (f) When the new system is finally in place, what effect would it have on the venture and the users of the system?

The Venture
..... [2]

The Users
..... [2]

- (g) What type of maintenance would be appropriate for this system?
..... [2]

- (h) Describe **one** future development note that can be included in this system.

.....
.....
..... [3]



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Question Q1. (a) What computer term do we use to refer to organised facts? [1] (b) Give one advantage of soft copy. [1] (c) Which portable device can be used to read soft copy? [1]

(a) Organised facts are called INFORMATION (raw facts become information once they have been organised/processed to have meaning).

(b) Advantage of soft copy: it can be stored, copied and shared easily/electronically (e.g. by email) without using any paper, and takes up far less physical storage space than a paper (hard) copy.

(c) A portable device that can read soft copy: a TABLET or an E-BOOK READER (also acceptable: a smartphone/laptop).

Question Q2. A biometric security system has been installed at a bank. (a) Name the part of the human body apart from eyes, which the system can use to identify a person. [1] (b) Give one disadvantage of biometric input. [1] (c) Describe one other automated security method that can be used at the bank. [2]

(a) The part of the body (apart from the eyes) that a biometric system can use to identify a person: the FINGERPRINT (also acceptable: the face, or the voice).

(b) Disadvantage of biometric input: the equipment/scanners needed are EXPENSIVE to buy and maintain compared to ordinary password systems.

Answer: (c) Another automated security method: a PASSWORD/PIN system, where each authorised user must correctly enter a secret code known only to them before the system's computer will grant them access to the bank's accounts/systems.

Question Q3. Masomo School has computerised its library which uses barcodes and a relational database. (a) Explain what is meant by a relational database. [2] (b) Name the device that would be used to read barcodes and one item in the library that can use barcodes. [2] (c) Each member's record has a unique number. Give one use of this number in the database. [1]

Answer: (a) A relational database is a database made up of several separate but LINKED tables, where each table stores data about one type of thing (e.g. members, books), and the tables are joined together using a common/shared field (a key), so that related data can be combined and retrieved together without needlessly repeating it in every table.

(b) Device: a BARCODE READER/SCANNER. Item in the library that can use barcodes: a BOOK (each book has a barcode label attached to it).

(c) Use of the unique member number: it acts as a PRIMARY KEY, used to uniquely identify each member's record and to link that member to the books they have borrowed, without confusing two members who might share the same name.

Question Q4. (a) State the difference between octal and hexadecimal number system. [1] (b) Which number can the computer pick as greater, between 1100 (Octal) and 1ED (hexadecimal)? Show your working. [3]

(a) The difference is their BASE: the octal number system is base 8 (using only digits 0-7), while the hexadecimal number system is base 16 (using digits 0-9 and letters A-F to represent values 10-15).

Answer: (b) Convert both to decimal. $1100 \text{ (octal)} = (1 \times 8^3) + (1 \times 8^2) + (0 \times 8^1) + (0 \times 8^0) = 512 + 64 + 0 + 0 = 576 \text{ (decimal)}$. $1ED \text{ (hex)} = (1 \times 16^2) + (14 \times 16^1) + (13 \times 16^0) = 256 + 224 + 13 = 493 \text{ (decimal)}$. Since $576 > 493$, the computer would pick 1100 (Octal) as the GREATER number.

Question Q5. The diagram shows a screen from a Presentation package: icons for a table (A), a chart/shape/document (B), and images/pictures/media clips (C). (a) State the names of the frames marked by A and B. [2] (b) State the use of frame C. [1] (c) State one device apart from a computer that is required to run a presentation. [1] (d) State one similarity between a Word Processor and a Desktop Publishing Package. [1]

(a) A = TABLE (insert-table icon). B = CHART (insert-chart/graph icon).

(b) Use of frame C: it is used to insert PICTURES/IMAGES (and clip art/media) into a slide of the presentation.

(c) A device apart from the computer required to run a presentation: a PROJECTOR (also acceptable: a large display screen).

Answer: (d) Similarity between a Word Processor and a Desktop Publishing Package: both allow the user to enter, format and arrange TEXT (e.g. changing font, size, bold/italic) on a page before printing it.

Question Q6. AND, NOT and OR gates have been used in a truth table with columns A, B, C, E=NOT C, F=A OR B, E AND F. Row 1: A=1,B=0,C=1,E=0. Row 2: A=1,B=1,C=0,E=1. Complete the missing F and E-AND-F outputs.

Answer: Row 1 (A=1,B=0,C=1): $E = \text{NOT}(C) = \text{NOT}(1) = 0$ (given). $F = A \text{ OR } B = \text{OR}(1,0) = 1$. $E \text{ AND } F = \text{AND}(0,1) = 0$. Row 2 (A=1,B=1,C=0): $E = \text{NOT}(C) = \text{NOT}(0) = 1$ (given). $F = A \text{ OR } B = \text{OR}(1,1) = 1$. $E \text{ AND } F = \text{AND}(1,1) = 1$.

Question Q7. Two typical user interfaces are shown: Interface 1 is a blank text-editor window with a 'File Edit Format View Help' menu bar (e.g. Notepad); Interface 2 is a Windows desktop showing icons and a Start menu. (a) Explain the meaning of the term, user interface. [2] (b) Mention the mouse function not applied in interface 1, but possible in interface 2. [1] (c) State the application software that makes use of interface 1. [1] (d) State the system software that uses interface 2. [1]

(a) A user interface is the means by which a person interacts with/controls a computer system — the menus, windows, icons and pointers (or, in a text interface, the typed commands) through which the user gives instructions and the computer displays feedback.

Answer: (b) Mouse function not applied in interface 1 but possible in interface 2: DOUBLE-CLICKING (or DRAGGING) an ICON to open a program/file — interface 1 is just a blank text-editing area with no icons to double-click or drag, whereas interface 2's desktop has icons that can be double-clicked/dragged.

(c) Application software using interface 1: a WORD PROCESSOR / text editor (e.g. Notepad).

(d) System software using interface 2: the OPERATING SYSTEM (e.g. Microsoft Windows).

Question Q8. A modern meat storage cold room uses computer systems to control freezing equipment: sensors feed data back to a Microprocessor, which controls Freezers and Air Conditioners, which in turn control Fans. (a) Give one example of data captured from sensors in the cold room. [1] (b) When loading and offloading the meat stocks, the freezers go off while the air conditioners come on. Explain how the system is able to do this automatically. [2] (c) Give one reason why data is fed back to the micro processors from sensors. [1]

(a) Example of data captured from sensors in the cold room: the TEMPERATURE inside the room (also acceptable: whether the door is open/closed, humidity).

Answer: (b) A sensor (e.g. a door/temperature sensor) detects that the cold room door has been opened (or that the temperature has risen) for loading/offloading; this data is sent to the microprocessor, which is pre-programmed to automatically switch the freezers OFF and switch the air conditioners ON whenever this loading condition is detected, then reverse this once loading is finished — all without any human needing to operate a switch.

(c) Reason data is fed back from sensors: so the microprocessor can continuously COMPARE the current room conditions against the desired/pre-set values, and automatically adjust the freezers/air conditioners to keep the room at the correct temperature.

Question Q9. Chinyemba runs a small business of sewing clothes and records costs (Material, Wages, Rent, Tax, Total) for April/May/June in a software package, with a Total Expenses row. (a) What software package is suitable for this record? [1] (b) Each month, Chinyemba types in the cost of various items. Explain why he does not need to type in the total cost. [1] (c) When 'Total Expenses' was typed, it could not appear fully. What could be done so that it is fully displayed? [1] (d) Explain how the amounts can be changed to show ngwees, that is 830.00. [1]

(a) A SPREADSHEET package (e.g. Microsoft Excel) is suitable for this record.

Answer: (b) He does not need to type in the total cost because it is calculated AUTOMATICALLY by a formula/function (e.g. a SUM formula) that adds up the values of the other cells in that row, and updates itself whenever any of those values change.

(c) To make 'Total Expenses' display fully: WIDEN the column (increase the column width) so the whole label fits and is fully shown.

(d) To show amounts in ngwees (e.g. 830.00): change/format the cells to display TWO DECIMAL PLACES (apply a number/currency format with 2 decimal places).

Question Q10. Mwikisa runs a small trading business and wants to change from a manual wages system to a computerised one. (a) Give one reason why it is important for him to undertake a feasibility study before considering the change to a new system. [1] (b) Give one advantage to Mwikisa of buying a software package instead of writing the program for calculating wages. [1] (c) Mention two types of tests he can carry out to check if the system works well. [2]

(a) A feasibility study is important because it checks WHETHER the new computerised system is technically possible and worth the cost/time (economically worthwhile) BEFORE Mwikisa commits money to it, avoiding a costly failed project.

(b) Advantage of buying a ready-made software package: it is CHEAPER and much FASTER to start using, since it is already written, tested and ready to install, instead of having to pay a programmer to write, test and debug a brand new wages program from scratch.

Answer: (c) Two types of tests: testing with NORMAL/valid data (to check the system correctly processes typical, expected wage figures); and testing with ABNORMAL/invalid data (to check the system correctly detects and rejects incorrect entries, e.g. a negative number of hours worked).

Question Q11. Most big organisations depend on large networks to run their businesses. One of their main concerns is data security. (a) Give a type of network on which security is critical. [1] (b) Give one type of security threat common on networks. [1] (c) Give one advantage of a bus topology. [1]

(a) A type of network on which security is critical: a WIDE AREA NETWORK (WAN) (especially one connected to the internet, e.g. a bank's network).

(b) A common network security threat: HACKING (unauthorised access) (also acceptable: viruses/malware).

(c) Advantage of a bus topology: it uses the LEAST amount of cabling of the common topologies, making it cheap and simple to install.

Question Q12. The pseudocode algorithm calculates the area of a triangle given base (b) and height (h): START; Enter(b); Enter(h); IF (b<0) or (h<0) THEN PRINT input error ELSE Calculate Area = $1/2 \times b \times h$; Print Area; END IF; STOP. Rewrite the algorithm using a flow chart. [4]

Answer: Flowchart (top to bottom): START (oval) -> Input box 'Enter b' -> Input box 'Enter h' -> Decision diamond 'Is b<0 OR h<0?' -> if YES, follow the branch to an Output box 'Print input error', then to STOP (oval); if NO, follow the other branch to a Process box 'Calculate Area = $1/2 \times b \times h$ ', then to an Output box 'Print Area', then joining back to the same STOP (oval).

Question Q13 (Section B). At Channa School, a charity has been formed for student donations and profits from fundraising events; each class competes for a shield for most money collected; records are currently manual. Donation records: Student name, Date, Class, Amount of donation. Fundraising-profit records: Event name, Date, Class, Profit made. Current system is paper-based, donations recorded per claim, all class records combined in a school donations master file. (a) A Systems Analyst will computerise this system. Give two tools he could use to check the progress on this project. [2] (b) State one method that would NOT be suitable to study the existing recording system, and explain why. [3] (c)(i) Give one use of a laptop for this system. [1] (ii) Give one use of a smartphone for this system. [1] (d) State what you would use flowchart symbols A (rectangle), B (wavy-bottom document shape) and C (cylinder) for in the project. [3] (e) Which two fields can be used to link the donation and profit databases? [2] (f) What effect would the new system have on the venture and the users? [4] (g) What type of maintenance would be appropriate for this system? [2] (h) Describe one future development note that can be included in this system. [3]

(a) Two tools to check project progress: a GANTT CHART (shows tasks against a timeline so progress can be tracked); and a PERT CHART (shows the sequence/dependency of tasks and how delays affect the whole project).

Answer: (b) Method NOT suitable: a QUESTIONNAIRE. Explanation: many students may not take the questionnaire seriously, may not understand the questions properly, or may simply fail to return it, giving the analyst unreliable or incomplete information about how donations are actually recorded — an INTERVIEW would be more suitable since the analyst can ask follow-up questions and clarify answers directly.

(c)(i) Use of the laptop: to enter/process and store all the donation and fundraising-profit records in the new database (the main data-entry and processing device). (ii) Use of the smartphone: to allow a class representative to record a donation instantly on the spot at a fundraising event, without waiting to reach the laptop.

(d) Symbol A (rectangle) = a PROCESS (a processing/calculation step, e.g. totalling a class's donations). Symbol B (document shape) = a DOCUMENT/REPORT (a printed output, e.g. a class's donation statement). Symbol C (cylinder) = DATA STORAGE (a file/database where the records are stored, e.g. the donations master file).

Answer: (e) Two linking fields: DATE and CLASS — both the donation records and the fundraising-profit records include a Date and a Class field, so these two shared fields can be used together to link/match entries between the two databases.

(f) Effect on the venture: the charity shield winner can be calculated much FASTER and more ACCURATELY each year, since totals no longer need to be added up by hand, improving trust in the results. Effect on the users: class representatives/teachers will need some TRAINING to learn to use the new system, but will SAVE TIME since they no longer have to manually add up donation and profit figures.

(g) Appropriate maintenance: PERFECTIVE maintenance — regularly updating/improving the system's features over time in response to user feedback and changing needs (e.g. adding new types of reports).

(h) One future development: adding an online/mobile-money donation feature, so that donors can send money directly to the school's account from their phone, with the system automatically recording the donation and adding it to the correct class's running total.

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