4.23 COMPUTER STUDIES (451)

4.23.1 Computer Studies Paper 1 (451/1)

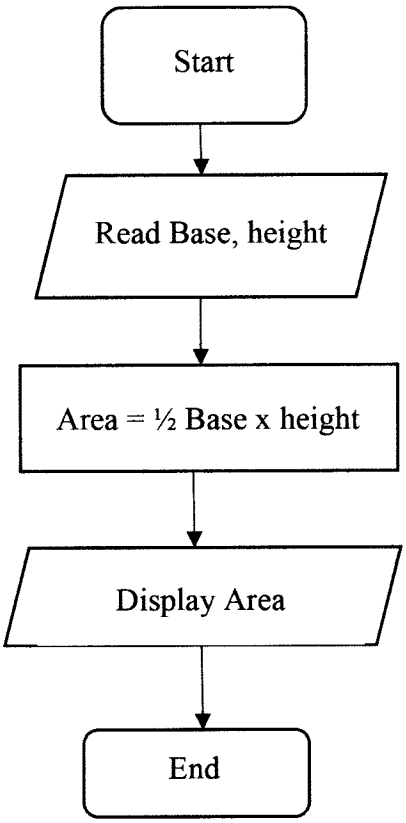
SECTION A

NO	ANSWER	MARKS
1.	**Computer input devices that capture data through the scanning method** - Image Scanner / camera / QRC (Quick Response Code) - Optical Mark Reader (OMR) - Magnetic Ink Character Reader (MICR) - Bar Code Reader(OBR) - Optical Character Reader (OCR) - Finger Print Scanner - Speech Scanner/Recognition - Facial Recognition Scanner - Gesture Scanner - Card Reader, Magnetic Strip Reader/Pin Card Reader - Retina/iris/eye Scanner **First 4 x ½**	
2.	**Possible outcomes arising from failure to restrict the use USB flash memory in a school's computer laboratory** - Computer hardware and peripheral devices may get damaged since flash disks may introduce viruses to the computers. - Students may copy software and games to play in the laboratory thereby distracting normal learning sessions. - Students may use it to copy software leading to infringement copy right act - Confidential data may be copied from the computers and disclosed to interested parties to the detriment of the school. **NB. No explanation 1 mark** **First 2 × 2**	**4**
3.	**Differences between a computer power cable and a computer interface cable** - A power cable has two or three wires whereas an interface cable has at least one wires. - Power cables are used to transmit electric current from a power source (such as a socket) to a computer whereas interface cables are used to connect devices with a computer/data. **Any 1 x 2=(2 marks)**	**2**
4.	**Factors to consider when selecting a laptop.** - The size of the screen, should be large enough to make the system design legible. - Processor speed. The processor speed must support complex computation involving large volume of data in a short period. - It should have memory capacity capable of loading both the database application and data of the on-going process. - Secondary storage (HDD) should be large to contain the database program and the data. - **Guide: Accept all laptop specifications except Portability** **First 2 x 2 = (4 marks)**	**4**

NO	ANSWER	MARKS
5.	**Operating systems that are not capable of supporting computer networks:** - Microsoft Disk Operating System (MS-DOS) - Personal Computer Disk Operating System (PC-DOS) - Windows Version 3.1, window 98, window 95, Windows 98, Windows 2000, Windows NT, Windows Millennium, Windows WANG - Android OS, Windows Mobile OS - Web OS, iOS, Palm OS - 2 BADA - Any OS for mobile devices **(Accept any valid OS)** **First 2 x 1 = (2 marks)**	**2**
6.	**(a) Explanation of process scheduling** This refers to the scheme through which an operating system arranges jobs as they queue for the processor. **(2 marks)** **(b) Explanation of interrupt handling** This refers to the mode of handling a job that interferes with the normal process of execution especially where the job being executed has a lower priority than the incoming job. **(2 marks)**	**4**
7.	**Examples of application packages: (Accept other valid answers)** (a) **Databases** - MS SQL, MySQL - SQL Server - Microsoft Access - Oracle - Foxbase - Paradox - Dbase - Lotus Approach - FoxPro - OpenOffice - Apache Database - Sybase - Libre Office database **First 2x½= (1 mark)** (b) **Word processors** - Microsoft word, lotus wordpro/ open office wordprocessor - Wordstar - Ami pro - Wordperfect - Open Office writer, Apple works, Libre Open Office writer - K-Word, MS Works **First** 2 x ½= **(1 mark)** (c) **Desktop publishing** Microsoft publisher - Corel Ventura - Page maker - Adobe Indesign - Serif PagePlus - Apple Page2 - QuarkXpress - Framemaker - Freehand - Adobe Photoshop - Adobe illustrator - Corel Draw - Adobe Pagemaker **First 2 x ½= (1 mark)**	**3**

NO	ANSWER	MARKS
8.	**Ways of preventing underage children from accessing adult content** - Installing of blocking/filtering and monitoring software that will control the content they can access. - Installing of monitoring software that will control the content they can access. - Set rules on usage of internet and social media websites such as watching only in the company of an adult. - Install remote access software which allows the guidance to monitor their children activities in the internet - Discuss your family values with the child and be clear on what may be watched on the internet. **Marking guidelines** - **Blocking** - **Filtering** - **Coming up with rules** - **Monitoring** - **Teaching Values/Ethics** **First 2 x 1 = (2 marks)**	**2**
9.	**Ways of maintaining confidentiality of patients' details in a health centre** (i) Keeping the data in encrypted form. (ii) Using passwords when one intends to access the information. (iii) Keeping audit trail (iv) Using policies and rules on who and when to access the details. (v) Avoiding writing the details on paper (vi) Antivirus (vii) Log files (viii) User Access levels (ix) Backups (x) Safe disposal of records (xi) Restricting movement of portable storage devices/media **First 2 x 1 = (2 marks)**	**2**

NO	ANSWER	MARKS
10.	**Conversion of 9.25_{10} to binary** 2 | 9 2 | 4 Remainder 1 M1 – Integral part 2 | 2 Remainder 0 M1 – Fractional part 2 | 1 Remainder 0 M1 – Answer 0 Remainder 1 ✓ 0.25x2 = 0.5 0 0.5 x 2 = 1.0 1 ✓ $9_{10}=1001_{10}$ $0.25_{10} = 0.01_2$ $9.25_{10} = 1001.01_2$ ✓ **(3 marks)**	3
11.	**Explain Distributed data processing:** – A technique where data is split and processing is done on different geographically located sites but connected to a central location **(2 marks)**	2

NO	ANSWER	MARKS
12.	**Flowchart for computing the area of a triangle.** **Guidelines** **Start ½** **Input ½** **Process ½** **Output ½** **Stop ½** **Logic ½**  Logic ✓ ½ **3 marks**	3
13.	**Circumstances that may necessitate the use of a questionnaire in systems development** – When there is need to cut costs. – When responses are urgently required. – When the audience population is large. – When the respondents require to be guaranteed anonymity. – When the respondents are scattered – When the respondents are literate/ can read & write – When the response required does not require explanation **(Evidence of inaccessibility of respondent)** **First 2 x 1 = (2 marks)**	2

NO	ANSWER	MARKS
14.	**Ways of saving costs through connecting computers to constitute a computer network** – Less communication costs since the communication can be done across the network directly. – Saving on labour since the network can be controlled from a single terminal by one person. – There is sharing of resources across the network thereby reducing the number of peripheral devices and services required. **First 2x1 = (2 marks)** **(Evidence of cost saving)**	**2**
15.	**Benefits that may be realized by using ICT to manage automobile traffic operations** – There is accuracy of *time/fairness slices* allocated to traffic at a junction. – There is safety of officers handling traffic since they do not have to be on the road physically. – Data on traffic can be available for reference at any time. – Data/Record Availability – Machines never get tired unlike humans so they maintain continuous control. – May be used to track vehicles involved in offences and crime. – ICT would maintain order on the roads and prevent traffic jam. – Costs effectiveness **(NB. Look for evidence of enhancement in the answer)** **First 3 x 1 = (3 marks)**	**3**
	Total	**40**

SECTION B (60 Marks)
Question 16 compulsory and any other three

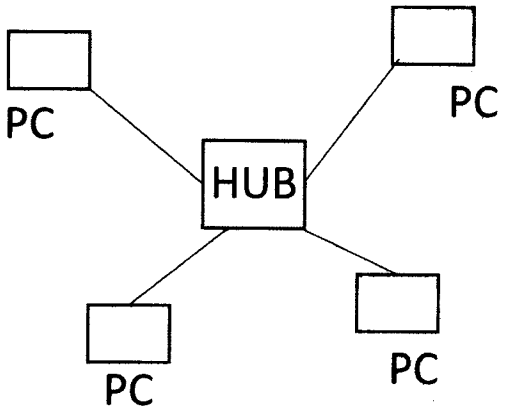
NO	ANSWER	MARKS
16. (a)	**Ways used to identify the existence of errors in a program:** (i) Desk check (dry run) - A manual technique for checking the logic of an algorithm (ii) Using the debugging tools /translators that are provided in the computer (iii) Using test data to validate the desired input/output **First 2 × 2 = (4 marks)**	**4**
(b)	(i) The type of translator required in this model is an **Assembler**. **(1 mark)** (ii) Reason for the conversion: To enable a computer to understand the program during execution. **(2 marks)**	**3**

(c)	**Pseudocode**
	Option A
	1. Start
	2. Count = 0
	3. TotalFees = 0
	4. AmountPaid =0
	5. TotalDiscount = 0
	6. Read AmountPaid and Date
	7. If Date <=opening Date and AmountPaid=2000 then
	a) Discount = AmountPaid *0.14
	b) DiscountAmount = 2000- Discount
	c) TotalFees = Total Fees + Discount+Discount
	d) TotalDiscount = TotalFees + AmountPaid
	Else
	e) TotalFees = TotalFees + AmountPaid
	End if
	8. Count = Count + 1
	9. If Count < 25 go to 6
	10. Print Total Discount, TotalFees
	11. Stop
		8

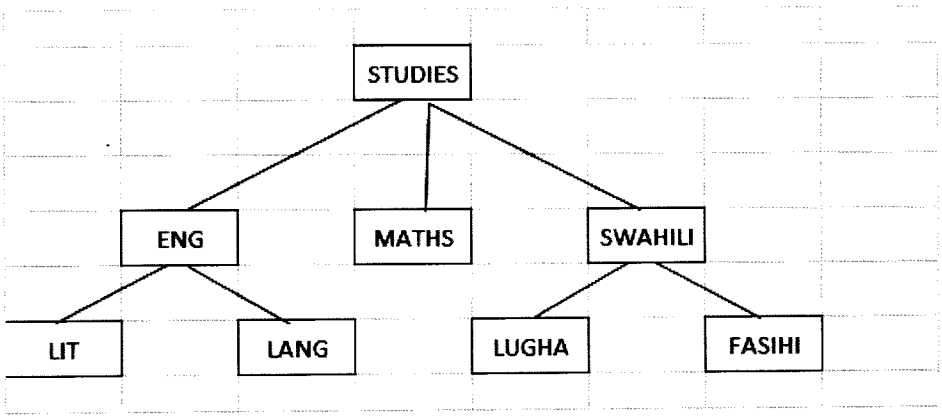
NO	ANSWER	MARKS

	Option B, C, D
	INITIALISE Count, Totalfees, DiscountAmount, TotalDiscount to zero
	REPEAT /while count<25/FOR COUNT=1 To 25 Do
	Amountpaid = 0
	Input amountpaid and Date
	IF Date<=openningdate AND Amountpaid =2000
	THEN
	Discount = Amountpaid =2000*0.14
	Discount + Amount=2000 - Discount
	Totalfees = Totalfees + Discount + Amount
	TotalDiscount = TotalDiscount +Discount
	ELSE
	Totalfees =Totalfees + Amountpaid
	ENDIF
	Count = Count + 1
	UNTIL Count =25 /ENDWHILE/ENDFOR
	PRINT Totaldiscount, Totalfees
	STOP
	Marks distribution
	– Atleast one variable initialized = 1
	– Atleast "IF" decision used to determine discount = 1
	– A loop used in an attempt to capture 25 students = 1
	– Atleast one implementation /process = 1
	– Input of amountpaid & date = 1
	– Output Amount & Discount = 1
	– Start & stop = 1
	– Logic = 1	

17. (a)	**Benefits of using twisted pair cables in a local area network** – The connectors are similar to those used in the telephone network hence it is easy to link the LAN to the telephone network./Compatible. – The twisted pair cables are relatively easy to install since they do not require any special equipment to terminate/Easy to set-up – Installation cost is cheap because the cost of the cable and associated accessories is low. – Guided media have relatively higher speeds of data transmission and better network utilization. – Readily available in the market – Cheap due to mass production **First 3 x 2 = (6 marks)**	**6**

NO	ANSWER	MARKS
(b)	(i) **Diagram for star network topology**  M1 =label M1 = shape **2 marks** (ii) Reasons that prompted for the use of star topology – The star topology is easy to set-up since it requires only one cable for each computer/easy to configure/easy to install. – In star topology if one computer breaks down, it doesn't affect the rest of the network. – It is easy to identify network faults/Easy to troubleshoot – It is easy to extend the network when need arises. – High speed of data transmission. – Allows centralization of resources such as concentrator/ server. – Gives network admin a focal point for diagnosing network faults. **First 3 x 1 = (3 marks)** (iii) **Requirements needed to connect the network (LAN) to the internet.** – ISP – Internet Service Provider who will provide internet services. – Router/Modem/Switch to be used to link the LAN to the internet. – Cables to link devices in the LAN to together. – Firewall to protect the network from intrusion. **First 2 x 2 = (4 marks)**	**9 marks**

NO	ANSWER	MARKS
18. (a)	**Ways through which advancement in ICT has benefited national security** – Keeping of records obtained from CCTV cameras aids in investigations and ascertaining evidence. – Surveillance cameras are used to help predict possible crime. – Offenders can be tracked as they escape and thereby block the escape routes. – Faster search of records helps in fast tracking prosecution of offenders. **Guideline** Look for Technology or Enhancement **First 3 x 2= (6 marks)**	**6**
(b)	Conversion of the binary number 1101.011_2 to its decimal number equivalent. 1101.011 $1x2^{-3} = \frac{1}{8} = 0.125$ M1 = Integral Part $1 \times 2^{-2} = \frac{1}{4} = \underline{0.250}$ M1 = Decimal part $0 \times 2^{-1} = 0 = 0.375$ M1= Answer $1 \times 2^0 = 1$ ✓ 1 $0 \times 2^1 = 0$ $1 \times 2^2 = 4$ $1 \times 2^3 = \underline{8}$ ✓ 1 13 $=\underline{13.375}_{10}$ ✓ 1 **(3 marks)**	**3**
(c)	(i) I. Formula to compute the mean of the scores = **Average (C4:C38)** (Ignore =) **(1 mark)** II. Number of scores exceeding 50 = **Count if (C4:C38,">50")** (Ignore =) **(2 marks)** (ii) Display "pass" if the score is greater than or equal to 30 and "fail" if otherwise. = **IF(C4>=30, "Pass", "Fail")** (Ignore =) **(3 marks)**	**6**
19. (a)	**Unit of measure for:** (i) Processor speed Hertz, Hz **(1 mark)** (ii) Memory capacity Byte, KB, MB, TB **(1 mark)** (iii) Data transmission speed Bits per second (BPS) **(1 mark)**	**3**

NO	ANSWER	MARKS
(b)	**Functions of a query in a database.** – Queries can be used to filter desired records based on some specified criteria. – A query may be used to perform computations based on field values within a table or on another query. – A query may be used to display records that are from different tables instead of displaying each from its own table. – A query can be used to update existing records as well as to delete unwanted records. – Append – Find/search – Filter fields – Sorting records – Make another table/create table – Create relationships **First 3 x 2 = (6 marks)**	**6**
(c)	(i) **Directory tree structure for the folders created.**  **@½ x 8 = (4 marks)** Level 0 = 1 Level 1 = 1 Level 2 = 1 (ii) Path for a file named Revision.Doc stored in the Lugha folder. **D:/STUDIES/SWAHILI/LUGHA/:REVISION.DOC** **(2 marks)**	**6**

NO	ANSWER	MARKS
20. (a)	**Ways of protecting computer components from theft** – Restricting access to the lab so that only accompanied learners access the room. **(Physical access to LAB).** – Use of monitoring cameras that will record all activities in the lab (CCTV). **(Deterrence).** – Use of locks to block access to the internal components of the computer. **(Locking component).** – Imposing stiff penalties to any person who may be involved in theft of components. **(Legal remedies)** – Using physical security such as burglar proof doors and human security **(Personnel security).** **First 3x2 = (6 marks)**	**6**
(b)	**Benefits of computer knowledge to an engineer** – Use of computer Aided Design software eases the work of an engineer during design. – Computers produce accurate documents than humans. – Computers can be used for teaching through simulation. – Work done during a computer may be re-used since only minor changes would be required. – **(Guideline – Look for evidence of enhancement in the answer)** **First 3 x 1 = (3 marks)**	**3**
(c)	**Challenges that a school may face by using wireless technology to link to the internet** – The network is hard to control since any user who has the password can access the network. – The network lacks centralized control and therefore there could be data security issues. Can lead to malware/virus attacks – It is not possible to control what particular categories of users can access, therefore some students may be exposed to inappropriate content. – Wherever there are many users accessing the internet, there is a likelihood of congestion which would slow the network. – Susceptible to hacking. – **Marking guideline - Any unauthorized access as a point on its own.** **First 3 x 2 = (6 marks)**	**6**