Teacher.co.ke

KENYA CERTIFICATE OF SECONDARY EDUCATION
451/1 COMPUTER STUDIES
PAPER 1 (THEORY QUESTIONS)

FORM ONE - INTRODUCTION TO COMPUTERS

1. Explain the following terms as used in computer science:

   (a) Data.   (1 mark)
   (b) Program.   (2 marks)
   (c) Data processing.   (2 marks)
   (d) Information.   (2 marks)

2. What role(s) does each of the following units of a computer play during data processing?
   i).   Input unit.   (1 mark)
   ii).   Output unit.   (1 mark)
   iii). Central processing unit.   (2 marks)

3. List down four characteristics of a computer.   (4 marks)

4. State four different parts that make up a computer.   (2 marks)

5. (a) Explain the term System Unit.   (1 mark)
   (b) Name four components found in the System unit.   (4 marks)
   (c) Outline three features of a computer's System Unit.   (3 marks)

6. (a) What are peripheral devices?   (1 mark)
   (b) Give two examples of peripheral devices.   (1 mark)

7. (a) Match the following generations of computers with the technology used to develop them.
                                                                      (2 marks)

Generation	Technology
First generation	Very Large Integrated Circuit
Second generation	Integrated Circuits
Third generation	Transistors
Fourth generation	Thermionic valves (Vacuum tubes)

   (b) Computers have evolved through a number of generations. List any 4 characteristics of
       the First generation of computers.   (4 marks)
   (c) Give four differences between today's computers and the first generation computers.
                                                                      (4 marks)

8. (a) State and explain five factors considered when classifying computers according to
       generations.   (5 marks)

   (b) Briefly discuss the classification of computer according to historical development
       (generations)   (10 marks)

9. Explain four methods of classifying computers.   (4 marks)

10. Giving two points in each case, state the difference between the following types of
    computers.

    (a) Supercomputer and Mainframe computer.   (2 marks)
    (b) Digital computer and Analogue computer.   (2 marks)
    (c) Special-purpose (dedicated) computer and a General-purpose computer. (2 marks)
    (d) Desktop computers and Laptop computers.

Teacher.co.ke

11. (a) Explain the emerging trends in Microcomputer technology in relation to size. (1 mark)

(b) Give two reasons why smaller computers like Laptops tend to be more expensive than Desktop computers. (2 marks)

12. (i) Explain four reasons which make laptop computers suitable for personal computing work. (4 marks)

(ii) Recommend any two application areas that would require the use of laptop computers. (2 marks)

13. Give three reasons why a Mobile phone is regarded to be a computer. (3 marks)

14. State a specific example where each of the following types of computers can be used.

   (a) Supercomputer. (1 mark)
   (b) Mainframe computer. (1 mark)
   (c) Minicomputer. (1 mark)
   (d) Microcomputer / Personal computer. (1 mark)

15. (a) Differentiate between a Minicomputer and a Personal Computer. (2 marks)
   (b) List three factors to be considered when purchasing a microcomputer. (3 marks)
   (c) Explain four reasons which make microcomputers suitable for personal computing work. (8 marks)

16. (a). Explain how computers are used in the following areas to process data. (10 marks)
      i).   Supermarket.
      ii).   Hospitals.
      iii).   Banks.
      iv).   Hotels.
      v).   Homes.
      vi).   Schools/education centres.
      vii).   Industries.
      viii). Police station.
      ix).   Transport industry.
      x).   Offices.

   (b) Give three advantages of using computers for data processing over other types of office and business equipment. (3 marks)

17. (a) Define the term 'Computer laboratory' and give three factors to be considered when preparing a computer laboratory. (4 marks)

   (b) Mention any FOUR features which a standard computer laboratory should have.
                        bc   (4 marks)

18. (a) State and explain three safety precautions and practices in a computer laboratory. (3 marks)

   (b) State four precautions that should be taken when handling diskettes. (4 marks)

19. Njeru the lab technician wants to buy a fire extinguisher for the computer lab. Which type of extinguisher is the most suitable for the computer laboratory? (1 mark)

20. (a) Give one major environmental and one energy problem Kenya faces as far as computer installations are concerned. (1 mark)

   (b) How could these problems be avoided? (2 marks)

21. What actions should be taken in case of a fire outbreak in the computer laboratory?
                                                                        (4 marks)
22. Describe the ideal environment for a computer to work properly. (3 marks)

23. Identify three facilities that will ensure proper ventilation in a room. (3 marks)

24. For each of the following, give one reason why they are not allowed in a computer laboratory. (2 marks)

    (i)   Smoking.
    (ii)   Eating foods.
    (iii)   Beverages/liquids.

25. Why would it not be good to install Powder or Water-based fire extinguishers in the computer room? (2 marks)

26. (a) State one reason why a computer needs to be connected to a stable power supply. (1 mark)

    (b) Give two reasons why it would be necessary to have a UPS (Uninterruptible power supply) in a computer laboratory. (2 marks)

27. Mention two things that are likely to cause eye-strain in the computer room. (2 marks)

28. Identify three proper sitting postures while using the computer. (3 marks)

29. Computers are usually susceptible to dust, humidity, and heat. State two ways of how you would control each of the three hazards in a typical computer laboratory? (3 marks)

30. What do you understand by the term '*Write-protected'* with reference to a diskette?

31. List three things that can spoil a Printer if they are not of the correct specification, and explain what damage may be caused. (3 marks)

32. A computer teacher has put a rule that diskettes should not be used in the Computer Laboratory.

    (a). Give a reason for the rule. (1 mark)
    (b). State two alternatives that can be used to achieve the same objective. (2 marks)

33. State and explain three ways that computer technology could make office work more efficient. (6 marks)

34. (a) Explain the steps you would follow to set up a new computer. (3 marks)

    (b) Explain the correct procedure for shutting down the computers in the computer laboratory. (4 marks)

35. A computer must go through the process of booting/initialization before use.

    (a) Briefly explain the term "computer booting". (1 mark)
    (b) Explain what happens in the computer during the booting process. (2 marks)
    (c) Give and explain two types of booting. (2 marks)
    (d) What type of memory is used to store the boot up program (the first program to be executed on switching on a computer. (1 mark)

    (e) State two ways of warm booting a computer. (2 marks)

36. Classify the following keyboard characters. (6 marks)

    a)   A, B, C ……..Z
    b)   0, 1, 2 ………9
    c)   F1, F2 ……..F9
    d)   Del, Insert, Backspace
    e)   Home, End, Page Up, Arrow keys
    f)   CTRL, SHIFT, ALT

37. State five different types of keys found on a standard keyboard. (5 marks)

38. Name and explain the function of the keyboard keys represented by the following symbols.
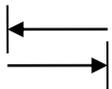
(i) ⇤⇥ (2 marks)

(ii) ↵ (2 marks)

(iii) ⇧ (2 marks)

39. (a) Explain the following terms associated with the use of a Mouse:

   i)   Left-clicking.
   ii) Double-clicking.
   iii) Right-clicking.
   iv) Drag and drop.

COMPUTER SYSTEMS

1. (a) Define the following terms as used in computing: (2 marks)

   i).   System.
   ii).   Computer system.

   (b) Differentiate between a Computer and a Computer system. (2 marks)

2. (a) List and explain three functional elements of a computer system (3 marks)
   (b) Using a well-labelled diagram, give a descriptive illustration of a computer system.
   (7 marks)

3. (a). The diagram below represents the essential features of a computer system. Study the diagram and answer the questions that follow:
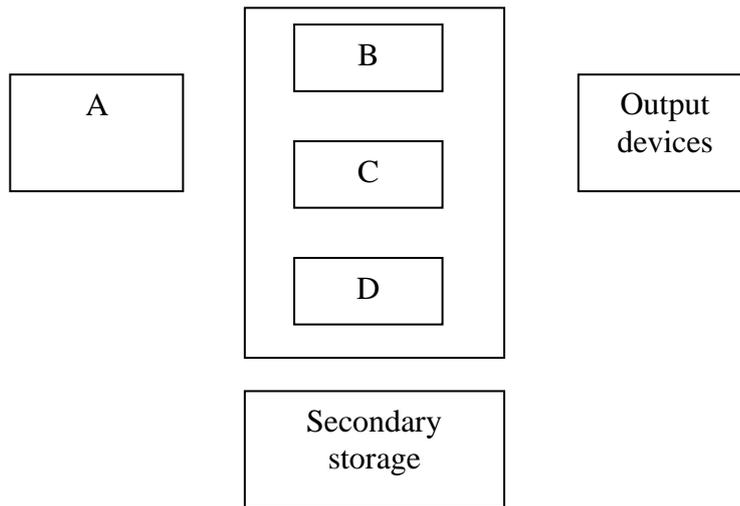

   (i).   Name the components A, B, C, and D (4 marks)
   (ii). On the diagram above, indicate the direction of the data flow using arrows.
   (3 marks)

4. Give an example of a: (3 marks)

   i)   Device that reads data.
   ii)   Pointing device.
   iii)   Voice input device.

5. (a) What are computer scanning devices? (1 mark)

   (b) Name the type of scanner used: (2 marks)

   i)   To capture prices of goods at points of sale terminals in supermarkets and superstores.

   ii)   To grade multiple choice examination

6. Briefly describe how each of the following I/O devices work.

   i)   Tracker ball.   (3 marks)
   ii)   Touch screen.   (3 marks)
   iii)   Light pen.   (3 marks)
   iv)   Graphic (Digitizing) Tablet.   (3 marks)
   v)   MICR.   (3 marks)
   vi)   OCR.   (3 marks)
   vii)   Speech (voice) recognition device.   (3 marks)

viii) Speech (voice) Synthesizer.   (3 marks)

7. (a) Explain the principle of a Kimball tag as a data input device.   (3 marks)
    (b) Outline any two advantages of a Light pen as an input device.   (2 marks)

8. (a) Identify two advantages and four limitations of the Speech recognition devices.
                                                                           (6 marks)
    (b) State two situations in which speech recognition devices may be useful as a method of
        data entry.   (2 marks)

9. (a) What are turnaround documents?   (1 mark)
    (b) Name any two data capture techniques that make use of turnaround documents.
                                                                           (2 marks)

10. Magnetic Ink Character Reader (MICR) technology uses the principle of magnetism to
    encode certain characters/data.

    i)   Recommend one application areas where this technology is used. (1 mark)
    ii)   Name any three data items that can be encoded using magnetized ink. (3 marks)

11. Name four factors one would consider when selecting a data input device. (4 marks)

12. (a) Describe three functions performed by the CPU.   (3 marks)

    (b) Explain the functions performed by each of the following central processing unit
        elements.
        i)   Control Unit.   (2 marks)
        ii)   Arithmetic and Logic Unit.   (2 marks)
        iii)   Registers.   (1 mark)
        iv)   The Main memory.   (2 marks)
        v)   The System clock.   (1 mark)

13. In reference to ALU, explain the meaning of *logic operations*, and give an example of this
    processing operation.   (2 marks)

14. (a) Give four types of registers found in the CPU.   (4 marks)

    (b) Explain how the CPU registers may be used to carry out a basic calculation such as:
        $2 + 3 = 5$ (4 marks)

15. State the function of each of the following computer bus.   (3 marks)

    (a) Data bus.
    (b) Address bus.
    (c) Control bus.

16. Computer systems are built from three types of physical components: Processor, memories
    and Input/Output devices.

        i)   State two tasks of a processor.   (2 marks)
        ii)   State the functions of I/O devices.   (2 marks)

17. (a) What is the computer Motherboard?   (1 mark)
    (b) State any four components found on the computer motherboard.   (2 marks)

18. (a) What is a read/write drive?   (2 marks)
    (b) State any two types of computer drives, giving an example of a storage device used by
        each.   (3 marks)

19. (a) Give two reasons why it is necessary for a computer to have secondary/backing storage
        facilities   (2 marks)

(b) List three different examples of auxiliary storage devices. (3 marks)

20. (a) The hard disk is composed of *Platters*, *Hard disk Drive*, *Access arm*, *Motor device*, *Read/Write heads*, and *Spindle*. State the function of each of these parts. (6 marks)

(b) State three advantages of using hard disks as medium of storage. (3 marks)

(c) Describe three precautions you would take to avoid damaging the hard disk. (3 marks)

(d) Explain the internal mechanism of the hard disk in reference to disk platters and read/write head. (3 marks)

(e) Describe the structure of a hard disk in reference to cylinders, tracks and sectors. (3 marks)

21. (a) Write down two advantages of storing data in a magnetic disk over a magnetic tape. (1 mark)

(b) State two reasons why Magnetic tapes are not commonly used as computer data storage medium today. (2 marks)

22. Differentiate between:
   i) Fixed and removable disks. (2 marks)
   ii) Volatile memory and Non-volatile memory. (2 marks)
   iii) Magnetic and Optical storage media. (2 marks)
   iv) CD-ROM and Floppy disk. (2 marks)
   v) Hardcopy and Softcopy. (2 marks)

23. Give three advantages of using a Scanner over the keyboard as an input device.(3 marks)

24. (a) Using a well-labelled diagram, differentiate between Sectors and Tracks as used in Magnetic disks. (4 marks)

(b) Draw a well-labelled diagram of a 3.5-inch floppy disk showing its parts. (7 marks)
(c) Explain four rules for handling magnetic disks. (4 marks)

25. (a) Give two uses of floppy disks in a computer system. (2 marks)
    (b) Draw a labelled diagram to illustrate the internal structure of a diskette. (7 marks)

26. The diagram below shows a formatted plate surface of a storage disk.
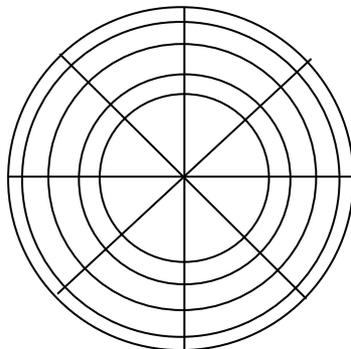
   Shade and label:
   (a) one sector (1 mark)
   (b) one block (1 mark)

27. RAM and Magnetic disks are both Random access devices. List four differences between the two devices. (4 marks)

28. State any three main differences between Primary and secondary computer storage. (3 marks)

29. Giving an example, explain the term memory Volatability? (2 marks)

30. (a) State four functions of Read-Only memory (ROM) (4 marks)
    (b) Give three characteristics of ROM (3 marks)
    (c) Name two different types of ROM (2 marks)

31. Mention any four types of programs or facilities that are stored in the Read Only Memory.
    (4 marks)

32. (a) Outline three characteristics of Random Access memory (RAM). (3 marks)
    (b) Name the two types of RAM clearly stating their differences. (3 marks)

33. Give two examples of special purpose memories found in the CPU. (2 marks)

34. Give two types of information that are found in the RAM. (1 mark)

35. What do the following phrases mean in reference to computers: (4 marks)

    i) 2 Ghz processor speed.
    ii) 128 KB Cache.
    iii) 256 MB RAM
    iv) 80 GB Hard disk

36. The diagram below shows an example of a secondary storage.
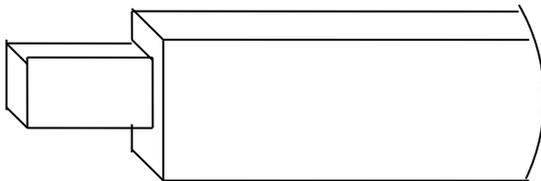
    i) Identify the name of the device. (1 mark)
    ii) List down two advantages of this device over a floppy disk in storage. (2 marks)

37. Calculate the capacity in MB of a two-sided floppy disk with 6 sectors per surface, and 512 bytes per sector. (2 marks)

38. (a) List any four examples of Optical storage devices. (4 marks)
    (b) Give two application areas that make extensive use of Optical disks. (2 marks)
    (c) Give two advantages of a Digital Versatile Disk over a normal Compact disk.
    (2 marks)

39. (a) Explain two features of a DVD that enables it to store more information than a CD-R.
    (4 marks)
    (b) How many Optical disks of 720 MB storage capacity are needed to store 20 GB storage of hard disk data? (Give your answer to the nearest whole number). (2 marks)

40. (a) Define the term Multimedia. (2 marks)
    (b) List down four components required to make a computer multimedia. (3 marks)

41. Giving reasons in each case, suggest the most suitable backing store medium for each of the following:

    i) Data for payroll program. (2 marks)
    ii) Documents for a word processing program. (2 marks)
    iii) A company's financial records for the last four years. (2 marks)

42. (a) List any four examples of computer output devices. (2 marks)

(b) Identify three functions of computer output devices. (3 marks)

43. Outline two advantages and two disadvantages of using a Monitor for output. (4 marks)

44. (a) Show two differences between a CRT monitor and a Flat-panel display. (2 marks)
    (b) Give three examples of flat-panel monitors available in the market today. (3 marks)

45. Describe five types of display video cards used in computers. (5 marks)

46. (a) What are pixels? (1 mark)
    (b) What role do pixels play in screen display? (1 mark)

47. List three possible factors that you would consider when buying a computer monitor.
    (3 marks)

48. (a) What are Character printers? (1 mark)
    (b) Give two examples of character printers. (2 marks)

49. State any four differences between Printer output and Monitor output. (4 marks)

50. Distinguish between Impact and Non-impact printers, and give two examples of each.
    (3 marks)

51. (a) State two advantages and one disadvantage of: (6 marks)

    i)   Laser printers.
    ii)   Inkjet printers.

    (b) Distinguish between a Line printer and a Page printer. (2 marks)

52. List three differences between a laser printer and a dot matrix printer. (3 marks)

53. (a) State two advantages of using a Printer for output. (2 marks)
    (b) Highlight four factors one should consider when purchasing a printer. (4 marks)

54. (a) Name two types of Plotters. (1 mark)
    (b) State the main difference between the plotters you have named in (a) above. (2 marks)
    (c) List three advantages of a Plotter over normal printer machines. (3 marks)

55. Give two advantages of using sound output devices. (2 marks)

56. George connected new multimedia speakers to his computer and tried to play his favourite
    music CD, but no sound came out. Suggest two problems that might have occurred.
    (2 marks)

57. Give one device which can perform both input and output functions in a computer.
    (1 mark)

58. (a) Define the following terms: (3 marks)

    i)   Port.
    ii)   Data interface cable.
    iii) Power cable.

    (b) State the function of the Power supply unit found in the System unit. (1 mark)

59. (a) Name any *two* peripheral devices that are connected to the computer through the PS/2
        port. (1 mark)
    (b) Give two major advantages of a USB interface cable over other cables in the computer.
        (2 marks)
    (c) Explain two differences between Serial (COM) and Parallel (LPT) communication ports
        of a computer. (2 marks)

60. In relation to cabling, give two reasons why a printer may not print work sent from the
    computer as expected? (2 marks)

61. (a) With reasons, briefly describe the most appropriate type of printer or output device for the output of: (6 marks)
    i) Customer invoices on multiparty stationery.
    ii) Letters to customers.
    iii) Detailed engineering designs.

    (b) Give three reasons why Optical disks are better storage devices compared to floppy disks.
    (3 marks)

62. Outline *three* precautions one should take when assembling a computer. (3 marks)

63. (a) Define computer Software. (2 marks)

    (b) Discuss the purpose and use of the following software found in microcomputers:

    i) System software. (8 marks)
    ii) Application software. (7 marks)

    (c) You have been asked by a local secondary school to assist them in selecting a microcomputer for their use. Discuss five hardware and five software factors you would consider in order to select the most suitable computer system. (10 marks)

64. (a). What is a utility software? (1 mark)
    (b). Give four examples of utility software. (2 marks)

65. Give two reasons why people prefer in-house developed application programs to general-purpose application packages. (2 marks)

66. (a) Why is it important to carefully study a warranty before committing yourself by signing it? (1 mark)
    (b) Give three reasons why one might purchase a computer with a one year warranty instead of a three year warranty. (3 marks)

67. (a) What is a Standard software? (1 mark)
    (b) Name five advantages and five disadvantages of off-the-shelf packages. (10 marks)
    (c) Discuss four factors you would consider when purchasing an Application package.
    (4 marks)

68. Differentiate between single-purpose programs and integrated software. (2 marks)

69. (a) A firm intends to purchase new software. List three items that should accompany the software. (3 marks)
    (b) When buying a new software product, usually an installation guide is needed by the buyer. State one reason for this. (1 mark)

70. State any two sources of an accounting application software for an organization.
    (2 marks)

71. Describe the following categories of software: (2 marks)
    (i). Firmware.
    (ii). Proprietary software.

72. (a) Explain the following software terms: (3 marks)

    (i) Authenticity.
    (ii) Portability.
    (iii) Modularity.

    (b) What is meant by the term User-friendly as used in software development?(1 mark)

73. Write the following acronyms in full: (3 marks)
    (i) BIOS

    (ii) EPROM

    (iii) WAP

74. Briefly state the need for: (2 marks)

    (i).   Software maintenance.

    (ii).   Software updates.

75. A school bought a computer system. The hardware items supplied include: a 800 MHz processor, 640 MB of RAM, a sound card, speakers, a monitor, a keyboard, a 120 GB hard disk, a floppy disk drive, a CD -Read/Write drive, a mouse, a modem, an inkjet printer, and a joystick.

   The software supplied include: an operating system, a BASIC interpreter, and the following packages: spreadsheets, graphics, word processor, art, database and games.

76. List three input devices from the given specifications.   (3 marks)

    (a). Explain the meaning of the following:

        (i).   800 MHZ   (2 marks)

        (ii). 640 MB of RAM   (2 marks)

        (iii). 120 GB hard disk   (2 marks)

    (c). Some of the students in the school use the computer to do homework.
        Name the package used to:

        (i)   Do calculations and draw graphs.   (1 mark)

        (ii). Write an essay.   (1 mark)

        (iii). Make a poster.   (1 mark)

    (d). Students enjoy playing noisy computer games.

        (i).   Which two hardware items are needed to produce sound?   (2 marks)

        (ii). Which input device is only used for playing games?   (1 mark)

OPERATING SYSTEMS

1. The central processor and peripheral devices of a computer system are coordinated by the operating system.

   (a) Define the term 'Operating system' (2 marks)

   (b) Other than the processor, list two other resources/components that an operating system manages. (2 marks)

   (c) There are several types of operating systems in use today. State two examples of operating systems with which you are familiar. (2 marks)

2. Explain why Operating systems are so important. (4 marks)

3. Explain any five basic functions of an operating system software. (5 marks)

4. Show the difference between the Control Unit of a processor and the Operating system in terms of functionality. (2 marks)

5. (a) Explain what is meant by system *Interrupt*? (1 mark)
   (b). Name any five examples of system interrupts and their possible causes. (10 marks)
   (c). Mention two advantages of using interrupts for input or output devices. (2 marks)

6. One of the tasks of an operating system is to allow communication between the computer and the user. State any four system messages from the computer to the operator. (4 marks)

7. (a) Why must an operating system be installed in the computer before installing any other software. (1 mark)

   (b) Differentiate between *scheduling* and *sequencing of tasks* by the operating system.
   (2 marks)

8. (a) Give three ways in which operating systems are classified. (3 marks)
   (b) Giving an example in each case, explain the following types of operating systems:

   i)   Single-user / Single-tasking (2 marks)
   ii) Multi-user / Multi-tasking (2 marks)

9. (a) Give two examples of single-user operating system. (1 mark)
   (b) State any three computer software that can be classified as a Multi-user operating system.
   (3 marks)

10. A computer user may interact with a computer either through Graphical User Interface (GUI) or through typed commands.

    (a) State two features of a graphical user interface. (2 marks)

    (b) Give two advantages of using GUI based operating system over a Command line interface. (1 mark)

    (c) Some computer systems still use Command line interfaces. State two advantages of command line interface. (2 marks)

11. State three merits of Menu driven interface over a Command based interface. (3 marks)

12. What is a *Deadlock* in reference to operating systems? (2 marks)

13. Explain briefly the following concepts as used in the Windows environment:

   (a) Desktop. (2 marks)
   (b) Window. (2 marks)
   (c) Icon. (2 marks)
   (d) Sidekick menu. (2 marks)
   (e) Taskbar. (2 marks)
   (f) Task (2 marks)

14. Describe three methods of opening an icon into a window. (3 marks)

15. Distinguish between Operating system software and Utility software. (2 marks)

16. Differentiate between a Toolbar and a Status bar. (2 marks)

17. (a) Identify three functions of each of the following window components: (2 marks)

   i) Taskbar.
   ii) Title bar.

   (b) List and explain down the three parts of the windows Taskbar. (3 marks)

18. (a) Identify three Application software that are installed in your computer. (3 marks)
    (b) Give three ways you can start an application in Windows. (3 marks)

19. (a) Explain each of the following commands used to manage files and folders. (5 marks)

   i) Rename
   ii) Copy
   iii) Sort
   iv) Properties
   v) Delete.

   (b). Name the command one would use to repair cross-linked files in Graphical user interface
      software. (1 mark)

20. (a) What is disk formatting? (1 mark)
    (b) Why should precautions be taken while formatting diskettes? (1 mark)

21. Differentiate between Hard-sectored and soft-sectored disk. (2 marks)

22. Distinguish between disk compression and disk defragmentation. (2 marks)

23. (a). Define 'Folder/ directory tree' (1 mark)
    (b). Give two examples of root directories you know. (1 mark)
    (c) Give three uses of sub-directories or subfolders. (3 marks)

24. Draw a directory tree showing how files and folders are organized by an operating system.
                                                                              (5 marks)

25. Identify two factors that you would consider when choosing an operating system for use in a
    computer. (2 marks)

26. You are employed in an organization as a computer operator in the Accounts department.
    The following are some of the tasks you are supposed to perform:
    • Data entry.
    • Ensuring that data entered in the computer is stored in a well-organized manner.
    • Backing up data.
    • Monitoring hard disk space of all computers in the department.

   (a) What is used in Microsoft Windows to store programs and files in a well-organized
      manner? (1 mark)

(b) Explain two methods of backing up data into a storage device in Windows.

(2 marks)

(c) Identify two reasons why a user needs to know the space available for data storage in the hard disk. (2 marks)

27. Explain how Windows organizes information in reference to files and folders. (1 mark)

28. Distinguish between System files and Application files. (2 marks)

29. Outline three reasons why it is important to first shut down the computer before turning it off.

(3 marks)

30. Outline the procedure of renaming a file or folder using windows operating system.

(3 marks)

31. Which keys in the keyboard should one press when he/she wants to:

i)   Cut
ii)   Copy
iii)   Paste
iv)   Rename an item

32. (a) What is meant by the term '*disk Partitioning*'? (1 mark)
    (b) Give two reasons why the hard disk may be partitioned. (2 marks)

33. (a) State two purposes of the Recycle Bin. (2 marks)
    (b) Give two advantages of using a password in Windows as an operating system.

(2 marks)

34. A computer specification has the following details:

Pentium III
1.44 MB Floppy disk drive
20 GB Hard disk
Full Multimedia
17" SVGA monitor
Pre-installed Operating system
Pre-installed Office Suite

(a).   What is meant by: - (3 marks)

(i).   1.44 MB floppy disk drive.
(ii).   20 GB
(iii). 17" SVGA

(b).   Which operating system might be pre-installed in this computer, and why? (2 marks)

35. A school organizes its work in directories. The directory WP contains the files CATS, EXAMS and ASSIGNMENTS. The directory SP contains the spreadsheet files. The directory DB contains the database files. The directory PROG is contained in the OTHERS directory. The directory WP also contains the PERSONAL directory. Given that the directory STUDENT contains directories SP, DB, WP and OTHERS.

(a). Draw the directory tree structure with C as the root. (7 marks)

(b). Write the path at which the contents of subdirectory DB can be erased or displayed.

(2 marks)

(c). Write the path for the directory PROG. (2 marks)

(d). Give two reasons for storing files in directories and subdirectories. (2 marks)

FORM TWO - WORD PROCESSING – MS WORD

1. (a) What is a Word processor?   (1 mark)
   (b) State 4 purposes of word processing.   (2 marks)
   (c) Name any three characteristics of a good word processor.   (2 marks)

2. State four editing and six formatting features of any good word processor.   (10 marks)

3. Give four uses of the Horizontal ruler in Microsoft Word.   (4 marks)

4. (a) What is a Template?   (1 mark)
   (b) State two advantages of using a template to create a document. (2 marks)
   (c) List five types of documents where you would use a template.   (5 marks)

5. Explain the difference between Type over and Insert mode in word processing. (2 marks)

6. Veronica tried to retrieve a document file following all the steps correctly. The filename did not appear in file list box. State three causes for this.   (3 marks)

7. (a) What is the function of the following combination of keys?   (4 marks)

   (i)   CTRL + A.
   (ii)   CTRL + Page Up.
   (iii) CTRL + Home.
   (iv)   CTRL + B
   (v)   CTRL + E
   (vi)   CTRL + Z
   (vii) CTRL + F
   (viii) CTRL + SHIFT + HOME

8. Explain the role/use of the following features in a word processor: (4 marks)

   (a) Find and Replace.
   (b) Undo and Redo.
   (c) Thesaurus.
   (d) AutoCorrect.

9. Differentiate between bolding and highlighting text.   (2 marks)

10. (a) Name and explain the use of any three buttons found in a Spell-check dialog box.
                                                                      (6 marks)
    (b) List the steps that you would use to correct wrongly-spelled words in a document using the spell-checking feature.   (3 marks)

11. Clearly explain the meaning of the following terms as used in word processing:

    (a) Blocking text.   (1 mark)
    (b) Word wrap.   (1 mark)
    (c) Italicizing text.   (1 mark)

(d) Page Break.   (2 marks)
(e) Header.   (2 marks)
(f) Footer.   (1 mark)
(g) Footnote.   (1 mark)
(h) Indenting.   (2 marks)
(i) Alignment.   (2 marks)
(j) Scrolling.   (1 mark)
(k) Wildcard.   (1 mark)

12. (a) What is document formatting?   (1 mark)
    (b) Give any five document formatting features.   (5 marks)
    (c) Differentiate between 'Superscript' and 'Subscript' font.   (2 marks)
    (d) State one function of Drop Cap in a document.   (1 mark)

13. (a) Explain the importance of Page numbers in a document.   (1 mark)
    (b) Explain how you can give different page numbering styles to different pages in a
         multipage document.   (1 mark)

14. Differentiate between:

    (a) A Hard page break and a Soft page break.   (2 marks)
    (b) Return address and Delivery address.   (2 marks)
    (c) AutoComplete and AutoCorrect.   (2 marks)
    (d) Drawing and inserting a table in a document.   (2 marks)
    (e) First line indentation and Hanging indentation   (2 marks)

15. (a) Distinguish between Copying and Moving text.   (2 marks)
    (b) Explain how a paragraph can be moved from one page to another using a word processor.
                                                                                                        (4 marks)
16. Distinguish between margins and borders as used in word processing.   (2 marks)

17. (a) What is Line spacing?   (1 mark)
    (b) Explain any three line spacing specifications used in Microsoft Word.   (3 marks)

18. Give any four alignment features.   (4 marks)

19. Give two advantages of using a Text box to write text in an advertisement.   (2 marks)

20. (a) Explain the concept of importing objects into a word processor.   (1 mark)
    (b) What is the difference between object Linking and Embedding?   (2 marks)

21. Give a reason why it may be necessary to merge cells in a table.   (1 mark)

22. (a) List two arithmetic operations that can be performed on a row of numeric data in a word
         processing table.   (1 mark)
    (b) In each case of (a) above, write the expression used.   (2 marks)

23. (a) Define Mail merging.   (2 marks)
    (b) Outline the three basic steps required to mail merge a document.   (3 marks)
    (c). List any two ways of merging a document with its data source.   (2 marks)
    (d) Give three advantages of mail merge over copy and pasting several times to mass mail a
         document?   (3 marks)

24. Give two advantages of previewing a document before printing.   (2 marks)

25. (a) Distinguish between Portrait and Landscape orientations.   (2 marks)

(b) State two reasons why it is necessary to specify the correct paper size before printing a document? (2 marks)

26. Name *two* functions performed by a word processor. (2 marks)

SPREADSHEETS – MS EXCEL

1. (a) What is Electronic spreadsheet software? (2 marks)
   (b). Explain the use of electronic spreadsheet software in business organizations.
   (4 marks)

2. Differentiate between the traditional analysis ledger sheet and an electronic spreadsheet.
   (5 marks)

3. (a) Describe the three components of a spreadsheet. (3 marks)
   (b) Apart from Microsoft Excel, give any two other application programs classified as spreadsheets. (2 marks)

4. Explain five application areas where spreadsheet software can be used. (5 marks)

5. Describe any five features (advantages) of electronic spreadsheet software. 5 marks)

6. Explain the following terms as used in spreadsheets. (4 marks)

   (a) Columns.
   (b) Rows
   (c) Cell.
   (d) Chart.
   (e) Automatic recalculation.

7. Explain the concept of 'What if' analysis. (2 marks)

8. (a) Explain the term 'Range'. (1 mark)
   (b) State two actions that can be performed on ranges in Microsoft Excel. (2 marks)

9. State any four data types used in a spreadsheet. (2 marks)

10. List four formatting features provided by Microsoft Excel. (4 marks)

11. Define the following terms as used in computer environment. (3 marks)
    (i). Operator
    (ii). Operands
    (iii). Operation

12. (a) Define the following terms as used in spreadsheets: (6 marks)
    (i) values
    (ii) formula
    (iii) Function
    (iv) Labels

    (b). List four mathematical functions provided by Microsoft Excel. (4 marks)

13. (a) The following is a simple payroll:

Teacher.co.ke

	A	B	C	D	E	F	G	H	I
1	Name	Hours Worked	Hourly Rate	Basic Pay	Gross Pay	Tax Deductions	NSSF Contributions	Allowance	Net Pay
2	John	8	200						
3	Peter	12	450						
4	Sam	22	300						
5	Njogu	30	286						
6	Mary	16	220						
7	Sally	45	468						
8	Jane	15	150						
9	Tina	3	280						

Write formulae using cell names for the following expressions. State where the formula is placed: (10 marks)

(i) Basic pay = Hours worked x Hourly rate.
(ii) Allowances are allocated at 10% of the Basic pay.
(iii) Gross pay = Basic pay + Allowances.
(iv) Tax deduction is calculated at 20% of the Gross pay.
(v) Net pay = Gross pay – Tax deductions.

(b). List four types of information that can be entered into a spreadsheet cell. (4 marks)

14. (a) What is a cell reference?   (1 mark)
    (b) Mention four examples of cell reference   (2 marks)
    (c) Distinguish between Absolute cell reference and Relative cell reference.   (2 marks)
    (d) For each of the following, state the type of cell reference.   (4 marks)

    i)   A5
    ii) F5
    iii) H$21
    iv) $D7

15. Compute: (2 marks)

    (i).   37 MOD 5

    (ii). 37 DIV 5

16. (a) A formula to add the contents of B5 and C4 was entered in cell F5. What will it become when it is copied to cell H8?   (1 mark)
    (b) Explain the reason for your answer.   (2 marks)

17. (a) Write the formulae =F10 + G20 as absolute.   (1 mark)
    (b) The formulae =A1+C2 is initially typed in cells D1. What will it be when copied to cell E1?   (1 mark)
    (c) What is the equivalent R1C1 reference for G20?   (1 mark)

18. Give at least five categories of functions that are available in Microsoft Excel. (5 marks)

19. What is the role of the following functions as used in a spreadsheet program? (5 marks)

    (a) Product
    (b) SQRT
    (c) Average
    (d) Max
    (e) IF

(f) COUNTIF
(g) SUMIF

20. A worksheet contains the data shown below:

Cell	A1	A2	A3	C1	C2	C3	G1
Entry	5	7	10	10	15	15	=SUMIF (C1:C3, "<> 10", A1:A3)

State the value displayed in G1. (2 marks)

21. Explain why a value such as 611233444555 may be displayed as ######### when typed on a spreadsheet. (2 marks)

22. (a). Assuming that the formula '= A5 * $B2' is in cell C10 of a spreadsheet. Show how it will appear after copying it to cell H12. (1 mark)

(b). Explain how you would select non-contiguous cells in spreadsheet. (2 marks)

23. A worksheet contains the data as shown below.

	A	B	C	D	E	F	G
1	5		10				
2	7		15				
3	10		17				
4							
5							
6							
7							
8							
9							
10							

(a) The formula =COUNTIF (C1:C3, "> 10") was entered at G1. Write down the value that was displayed. (2 marks)

(b) Write down the formula that would be entered at cell B7 to sum the values in column A whose values are greater or equal to 5. (3 marks)

(c) The formula = $C2 + C$3 is entered in cell C5 and then copied to D10. Write down the formula as it appears in the destination cell. (3 marks)

24. (a) What is a Chart wizard in spreadsheets? (1 mark)
    (b) Give two examples of charts that you know. (2 marks)
    (c). Outline the steps required when creating a simple chart. (6 marks)

25. Andrew, Jane, David and Zablon had Tea, Sausages and Bananas for breakfast. They took one sausage, two sausages, three sausages and one sausage respectively. In addition, they each took a cup of tea and two bananas. Tea, sausages and bananas cost Ksh. 10, 15, and 5 respectively.

(a) By naming columns A, B, C, ………and rows 1, 2, 3……….Construct a worksheet showing the above information. (7 Marks)

(b) State the expression you would use to obtain:

    i) Total expenditure by David. (4 marks)
    ii) Total number of sausages taken. (2 marks)
    iii) The cost of the cheapest item. (2 marks)

26. The following diagram is a Microsoft Excel worksheet containing the scores of Form 1 students of Excellent High school.

	A	B	C	D	E	F	G
1	STUDENT NAME	ENG	KISW	MATH	SCI		
2	Ali Shah	75	65	80	78		
3	Arthur Kamau	80	78	58	72		
4	Maalim Ahmed	75	78	64	80		
5	Harry Mutua	65	84	78	81		
6	Martin Mulama	90	81	57	74		
7	Keben Korir	73	65	85	78		

Write Microsoft Excel formula to calculate:

(a) Total score for each student. (1 mark)
(b) Highest score per subject. (1 mark)
(c) Mean score per subject. (1 mark)
(d) Best overall student. (1 mark)

27. What is a cell reference error as used in spreadsheets? (1 mark)

28. A worksheet contains the data shown below:

	A	B	C	D
1	Jane			
2	Kim			
3	June			
4	Jack			
5	Jane			

(a). The formula =IF(A1:A5 = "Jane", 1, 0) is entered in cell B1

   (i). State the value displayed (2 marks)
   (ii). If the formula in B1 is copied and pasted to cells B2, B3, B4 and B5 respectively, fill in what is displayed in each cell. (2 marks)

(b). Under what two conditions does a worksheet display # # # # # # (2 marks)
(c). A spreadsheet application can be used in analysis of trends of performance. List any three types of charts you can make. (3 marks)

29. Consider the entries made in the cells below:

Cell	B2	B3	C10	C11	C13
entry	200	100	B2	B3	=C10 + C11

State the value displayed in cell C13. (1 mark)

30. A student presented a budget in the form of a worksheet as follows.

	A	B	C
1	Item	Amount	
2	Fare	200	
3	Stationery	50	
4	Bread	300	
5	Miscellaneous	150	

6	Total		

The student intends to have spent half the amount by mid-term.

    (a). Given that the value 0.5 is typed in cell B9, write the shortest formula that would be typed in cell C2 and then copied down the column to obtain half the values in column B.   (1 mark)

    (b). Write two different formulae that can be typed to obtain the total in cell B6 and then copied to cell C6.   (2 marks)

31. The cells K3 to K10 of a worksheet contain remarks on students' performance such as Very good, Good, Fair and Fail depending on the average mark. Write a formula that can be used to count all students who have the remark "Very good".   (3 marks)

32. The following information shows the income and expenditure for "Bebayote" matatu for five days. The income from Monday to Friday was Kshs. 4,000, 9,000, 10,000, 15,000, and 12,000 respectively while the expenditure for the same period was Kshs. 2,000, 3,000, 7,000, 5,000, and 6,000 respectively.

    (i) Draw a spreadsheet that would contain the information. Indicate the rows as 1, 2, 3 …. and the columns as A, B, C …..   (4 marks)

    (ii) State the expression that would be used to obtain:

       I Monday's profit   (2 marks)

       II total income   (2 marks)

       III highest expenditure.   (2 marks)

33. (a) Distinguish between the following sets of terms as used in spreadsheets.
       (i)   Worksheet and workbook.   (2 marks)
       (ii)   Filtering and sorting.   (2 marks)

    (b) State one way in which a user may reverse the last action taken in a spreadsheet package.   (1 mark)

    (c) The following is a sample of a payroll. The worksheet row and column headings are marked 1, 2, 3 … and A, B, C … respectively.

	A	B	C	D	E	F	G	H
1	NAME	HOURS WORKED	PAY PER HOUR	BASIC PAY	ALLOWANCES	GROSS PAY	TAX DEDUCTIONS	NET PAY
2	KORIR	12	1500					
3	ATIENO	28	650					
4	MUTISO	26	450					
5	ASHA	30	900					
6	MAINA	18	350					
7	WANJIKU	22.5	500					
8	WANYAMA	24.5	250					
9	OLESANE	17	180					
10	MOSETI	33	700					
	TOTALS							

       Use the following expressions to answer the questions that follow:

       • Basic pay = Hours worked x pay per hour

- Allowances are allocated at 10% of basic pay
- Gross pay = Basic pay + allowances
- Tax deductions are calculated at 20% of gross pay
- Net pay = Gross pay – tax deductions

Write formulae using cell references for the following cells:

(i)   D2   (1 mark)

(ii) E4   (1 mark)

(iii) F10   (1 mark)

(iv) G7   (1 mark)

(v)   H5   (1 mark)

DATABASES – MS ACCESS

1. (a) Define a Database, and give two examples of database programs in use today. (2 marks)
    (b) List any two database objects.   (2 marks)

2. List five features found in an electronic database management system.   (5 marks)

3. State three advantages of an electronic database over the traditional file management system.
                                                                 (3 marks)
4. (a) Distinguish between the following terms in relation to a database: (6 marks)

    i)   Field type and field properties.
    ii)   Records and Fields.
    iii) AND and OR operators.

    (b). Explain three types of database models.   (3 marks)
    (c) Explain three major concerns in database systems.   (3 marks)

5. (a) Distinguish between Flat file and Relational databases. (2 marks)
    (b) State three operations that can be performed on a relational database files. (3 marks)

6. Identify five functions of a Database management system.   (5 marks)

7. Explain the importance of using Database management system in organizations. (2 marks)
8. State the components of a Database hierarchy in ascending order.   (2 marks)

9. State the use of the following objects in Databases.

    i)   Tables   (1 mark)
    ii)   Forms   (1 mark)
    iii) Query   (1 mark)
    iv)   Macros   (1 mark)
    v)   Reports   (1 mark)

10. Name *two* different types of tools one can use to search for data in a database. (1 mark)

11. (a) Differentiate between: (14 marks)

    i)   Primary key and Relationship.
    ii)   Tabular and Columnar form layout.
    iii) Database file and Database table.

iv) Primary key and Index.
v) Field name and Caption.
vi) Table and Query.
vii) Bound and unbound control.

(b) What is the importance of the Primary key? (1 mark)
(c) State three types of relationships that can be used to link tables in Databases.

(3 marks)

12. (a). Describe four major shortcomings of the conventional (paper) file structures that are being addressed by the database approach. (4 marks)
    (b). List any two methods used to secure data in a database. (2 marks)

13. A student's database comprises of students' details table and fees received table as shown below:

Students' details table   Fees Received table

| Surname |
| Middle Name |
| First Name |
| Admission Number |
| Course |

| Date |
| Amount |
| Receipt Number |

(i) State the primary key field for each table. (2 marks)

(ii) State the field which should serve as the linking field for the two tables.

(2 marks)

DESKTOP PUBLISHING (DTP) – MS PUBLISHER

1. (a) What is Desktop publishing? (2 marks)
   (b) Give three examples of desktop publishing software available in the market today.
   (3 marks)
   (c) State five features in desktop publishing. (5 marks)

2. Identify four common features in word processing and desktop publishing software.
   (4 marks)

3. List four areas of DTP application. (2 marks)

4. Differentiate between the following:

   (a) Pasteboard and Printable page. (2 marks)
   (b) Margins and Column guides. (2 marks)
   (c) Change case and drop cap. (2 marks)
   (d) Kerning and tracking. (2 marks)
   (e) Fill and line stroke. (2 marks)

5. Explain the following as used in DTP: (3 marks)

   (a) Master pages.
   (b) Layering.
   (c) Placeholders / selection handles.

6. Why are master pages important in a publication? (1 mark)

7. (a) What are non-printing guides? (1 mark)
   (b) Give three nonprinting guides used in PageMaker. (3 marks)

8. What does the term *Gutter* mean in relation to column setting? (1 mark)

9. What commands are used in place of portrait and landscape page orientation in PageMaker?
   (1 mark)

10. Explain the function of each of the following tools on the PageMaker's toolbox.
    (4 marks)

    i)   Pointer tool
    ii)   Text tool

iii)   Rectangle tool
iv)   Rotate tool
v)   Zoom (magnifier) tool

11. Mention the three main purposes of a desktop publishing software.   (3 marks)

12. Define the term *artwork*.   (1 mark)

13. Give three methods that are used to transform an object.   (3 marks)

14. (a) What is Text wrap?   (1 mark)
    (b) Give three ways you can wrap text on an object.   (3 marks)
    (c) Explain the concept of wrapping text around objects.   (1 mark)

15. Explain the following graphic terms: (2 marks)

    i).   Group.
    ii).   Rotate.
    iii). Crop.

16. State three ways of moving round the page in a Desktop Publishing window. (3 marks)

INTERNET & E-MAIL

1. Explain the following: (3 marks)

    (a)   Internet.
    (b)   Intranet.
    (c)   File Server.

2. List any three major services provided on the Internet.   (3 marks)

3. Name four facilities that are needed to connect to the Internet.   (4 marks)

4. Your manager wishes to be connected to the Internet. He already has a powerful Personal
    Computer (PC), a Printer, and access to a Telephone line. However, he understands that he
    will need a Modem.

    Required:

    (a) State why a modem is required to connect him to the Internet.   (2 marks)
    (b) Suggest any four application areas in which you would expect a supermarket retail
         manager to use the Internet.   (4 marks)

5. (a) What is a Website?   (2 marks)
    (b) Give the advantages and disadvantages of a Website.   (4 marks)

6. (a) What is meant by the term E-learning?   (1 mark)
    (b) A school intends to set-up an e-learning system. List three problems that are likely to be
        encountered.   (3 marks)

7. (a) What are network Protocols?
    (b) Write the following in full:

        i)   TCP/IP
        ii)   HTML
        iii)   HTTP
        iv)   FTP

8. (a) Explain the meaning of the following concepts as used in Internet: (6 marks)

i)   Internet service provider (ISP)
ii)   Web pages
iii)   Internet telephony
iv)   Browser software
v)   Hyperlink

(b) Name *three* examples of Internet Service Providers (ISP) in Kenya.   (3 marks)

9. Give two common examples of web browsing software.   (1 mark)

10. Briefly describe four advantages of using Internet to disseminate information compared to other conventional methods.   (8 marks)

11. (a) Identify the parts of the following e-mail address labelled A, B, C, and D. (4 marks)

Iat@africaonline.co.ke
    ↑   ↑   ↑ ↑
    A   B   C D

(b) Mention two examples of e-mail software.   (2 marks)

12. A school has its e-mail address as *mwangaza@school.co.ke*. Briefly explain this address code.   (3 marks)

13. State two benefits of saving information from the Internet to your hard disk.   (2 marks)

14. Explain the following internet address *http://www.google.com* in reference to the structure of a URL.   marks)

15. Identify institutions whose e-mail addresses end with the following extensions: (6 marks)
    i)   .org
    ii)   .edu
    iii)   .com
    iv)   .net
    v)   .mil
    vi)   .gov

16. (a) Discuss four advantages and two disadvantages that electronic mails have over regular mails.   (6 marks)
    (b) Give three differences between Post-office mail and Electronic mail (E-mail).
                                                                                (3 marks)

17. (a) What is a Search engine?   (2 marks)
    (b) Give four examples of search engines you know.   (2 marks)
    (c) State two ways that search engines use to locate Web pages.   (2 marks)

18. List *two* advantages of using Hyperlinks when browsing the Internet.   (2 marks)

19. Differentiate between a www server and a Host computer.   (2 marks)

20. The Internet can be used to source information about emerging issues that may not be available in print form. Give two advantages and two disadvantages of information obtained from the Internet.   (4 marks)

DATA SECURITY & CONTROL

1. (a) Differentiate between Data Security and Data Integrity. (2 marks)

    (b) Give the three types of data that should be protected in a computer. (3 marks)

2. State any three threats to data and information. (3 marks)

3. State five possible ways of preventing data loss from a computer. (5 marks)

4. (a) Define the term Computer crime. (2 marks)

    (b) Explain the meaning of each of the following with reference to computer crimes.

       i)   Tapping
       ii)   Piracy.
       iii)   Trespass.
       iv)   Industrial espionage
       v)   Data alteration
       vi)   Fraud
       vii)   Firewalls

5. Give two reasons that may lead to computer fraud. (2 marks)

6. Outline four ways of preventing piracy with regard to data and information. (4 marks)

7. (a) Differentiate between Hacking and Cracking with reference to computer crimes.
    (2 marks)
    (b) Describe the following terms with respect to computer security: (6 marks)
       (i)   Audit trail.
       (ii) Data Encryption.
       (iii) Log files.
       (iv) Firewalls.
       (v)   Physical security
       (vi) Logic bombs.

8. (a) What is a Computer virus? (2 marks)
    (b) Outline four symptoms of a virus infection in a computer system. (4 marks)
    (b) State two damages which a computer virus may cause to a computer. (2 marks)
    (c) Explain three control measures you would take to protect your computers from virus attacks. (3 marks)

9. List three functions of an antivirus software. (3 marks)

10. Computer systems need maximum security to prevent an unauthorized access. State six precautions that you would expect an organization to take to prevent illegal access to its computer-based systems. (6 marks)

11. (i) Explain what is meant by the term "computer security" (2 marks)
    (ii) State two environmental factors that can affect operations of a computer. (2 marks)
    (iii) State two control techniques or measures that can be implemented to prevent the effect in (i) above. (2 marks)

12. Explain why the following controls should be implemented for computer based systems.

    i)   Backups (2 marks)
    ii)   Air conditioning (2 marks)
    iii) Uninterruptible power supply (UPS) (2 marks)
    iv)   Segregation of duties (2 marks)
    v)   Passwords (2 marks)

13. Give four rules that must be observed in order to keep within the law when working with data and information. (4 marks)

14. (a) Define the term Computer ethics. (1 marks)
    (b) Give two examples to show how a person who has committed a computer crime can help to improve a computer system. (2 marks)

FORM THREE - DATA REPRESENTATION IN COMPUTERS

1. Data in a computer is represented in one major form. Define the term 'Data representation' in a computer. (1 mark)

2. (a) Differentiate between Analogue data and Digital data. (2 marks)
   (b) Draw a sketch of:

       (i). Analogue data signal. (1 mark)
       (ii). Digital data signal. (1 mark)

3. Give two reasons for the popularity of binary number representation. (2 marks)

4. Explain the role of a Modem in communication. (2 marks)

5. Distinguish between the following terms as used in data representation in computers:

       (i). A Byte and a Nibble. (2 marks)
       (ii). Word and Word length. (2 marks)

6. Arrange the following data units in ascending order of size.

       BYTE, FILE, BIT, NIBBLE. (2 marks)

7. Write out what A, B, C and D represent in the table below. (4 marks)

Number System	Values
A	0, 1
B	0, 1, 2, 3, 4, 5, 6, 7
C	0, 1, 2, 3, 4, 5, 6, 7, 8, 9
D	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F

8. Perform the following computer arithmetic. In each case, show how you arrive at your answer.

       (a) Convert the following Decimal numbers to their Binary equivalent.

    i)   11   (1 mark)

    ii)   001   (1 mark)

    iii)   457

(b) Convert the following Octal numbers to their Binary equivalent.

    i)   77   (2 marks)

    ii)   0000001   (2 marks)

(c) Use Binary addition to solve the following decimal summations.

    i) $4_{10} + 3_{10}$ (2 marks)

    ii) $13_{10} + 2_{10}$ (2 marks)

(d) Convert the following Hexadecimal numbers to their Binary equivalent.

    i)   C3   (3 marks)

    ii)   13   (3 marks)

(e) Convert the following Binary numbers to their Hexadecimal equivalent.

    i)   110111.11   (2 marks)

    ii)   1.1110101   (2 marks)

    iii)   110000111111111111   (2 marks)

9. (a) State one use of hexadecimal notation in a computer.   (1 mark)

    (b) Convert 767_8 to hexadecimal.   (2 marks)

10. Use One's compliment to solve the following sums:

    i)   9 – 6   (3 marks)

    ii)   17 – 15   (3 marks)

    iii)   1110 – 1011   (2 marks)

    iv)   111010 – 110011   (2 marks)

11. Perform the following conversions:

    i) 20.2_{16} to decimal.   (3 marks)

    ii) 11101_2 to Decimal.   (3 marks)

12. (a) Perform the following Binary arithmetic: 75 + 45   (2 marks)

    (b). Use Two's compliment to perform the following Binary subtraction:

    i)   10111 – 10001   (2 marks)

    ii)   11000 – 10011   (2 marks)

13. Use Two's compliment to solve the following SUMS (the numbers are in decimal notation)

    i)   23 – 20   (3 marks)

    ii)   17 – 14   (3 marks)

14. Perform the following binary arithmetic:

    (i).   11100111 + 00101110   (1 mark)

    (ii). 1000 – 101 (using 2's complement)   (2 marks)

15. Convert the decimal number 4 ¾ into binary form.   (4 marks)

16. Convert the binary coded decimal number given into its hexadecimal equivalent.
    10001001_2 (show your work clearly)   (2 marks)

17. Work out the 8-bit binary two's complement of the number -2_{10} (3 marks)

18. Convert the hexadecimal number FC1 to its binary equivalent. (6 marks)

19. Convert $7AE_{16}$ to a decimal number. (2 marks)

20. State three methods of representing data in binary number system. (3 marks)

21. (a) Explain Binary Coded Decimal code of data representation. (1 mark)
    (b) Write the number 451_{10} in BCD notation. (1 mark)

22. (a) Subtract 0111_2 from 1001_2 (1 mark)
    (b) Using two's complement, subtract 7 from 4 and give the answer in decimal notation.
    (4 marks)

    (c) Convert:

        (i) $91B_{16}$ to octal (3 marks)
        (ii) 376_8 to hexadecimal (3 marks)
        (iii) 9.625_{10} to binary (4 marks)

DATA PROCESSING

1. Distinguish between Data and Information. (2 marks)

2. Using an illustration, describe the four primary stages of the data processing cycle. (6 marks)

3. Clearly differentiate between the following processing terms:

    i)   Data collection and Data capture. (2 marks)
    ii)   Verification and Validation. (2 marks)

4. (a) Give four methods of data collection. (4 marks)
   (b) Outline the stages of data collection. (3 marks)

5. (a) Explain the relevance of the term Garbage in Garbage out (GIGO) in reference to errors in
       data processing. (1 mark)
   (b) Explain two main types of errors in data processing. (2 marks)

6. (a) Name and explain the two types of transcription errors. (3 marks)
   (b) State three types of computational errors. (3 marks)

7. (a) Define the term *Data integrity* (1 mark)
   (b) State three ways of minimizing threats to data integrity. (3 marks)

8. (a) Briefly explain the following data processing modes:

    i)   Online processing. (2 marks)
    ii)   Real-time processing. (2 marks)
    iii) Batch processing. (2 marks)
    iv)   Distributed processing. (2 marks)
    v)   Multi-programming (multi-tasking). (2 marks)
    vi)   Multi-processing. (2 marks)

vii)   Interactive processing.   (2 marks)
viii)   Remote job entry.   (2 marks)

(b) Differentiate between:
    (i). CPU bound jobs and I/O bound jobs.   (4 marks)
    (ii). Command files and Text files.   (2 marks)

9. (a) Mention five features of a Real-time system.   (5 marks)
    (b) Name two industries that extensively use Real-time processing.   (2 marks)
    (c) Give three advantages and two disadvantages of a Real-time system. (5 marks)
    (d) In Real-time systems, Front-End Processors are quite useful. State any three reasons why you think they are important.   (3 marks)
    (e) State why an online data processor should be a real-time processor in a multi-access plant.   (2 marks)

10. Most companies are now shifting from the use of centralized mainframe computers to the use of geographically distributed personal computers. This method of data processing is known as Distributed Data Processing (DDP).

i)   Name any three computing resources that can be distributed.   (3 marks)

ii)   Explain three ways in which microcomputers/personal computers can be networked to form a distributed data processing system.   (6 marks)

iii)   Name four examples of industries and business organizations that extensively use distributed processing systems.   (4 marks)

iv)   List down two benefits and three risks that might be associated with the distributed data processing system.   (5 marks)

11. Explain time sharing data processing mode, giving two advantages and two disadvantages of its application.   (6 marks)

12. (a) Give two benefits that are derived from Multi-programming.   (2 marks)
    (b) In a Multiprogramming environment, how does the Operating system ensure that users' input and output do not get jumbled (cluttered) up?   (1 mark)

13. List three factors to be considered when deciding on the choice of an electronic data processing method.   (3 marks)

14. (a) What is a Computer file?   (2 marks)
    (b) Name the three constituent parts of a computer file.   (3 marks)
    (b) State and explain five different types of data processing files. (5 marks)

15. Distinguish between Logical and Physical computer files.   (2 marks)

16. Arrange the following components of the information system data hierarchy in ascending order of complexity:

Field, Database, Byte, Record, Bit, and File   (4 marks)

Provide a brief description for each component.   (4 marks)

17. (a) State *three* advantages of storing data in computer files over the manual filing system.   (3 marks)

    (b) List four problems faced when using <u>standard files</u> for data processing systems.   (4 marks)

18. (a) What is File organization?   (2 marks)
    (b) Describe what is meant by each of the following filing systems: (4 marks)

    i)   Serial.
    ii)   Sequential.
    iii)   Indexed sequential.

iv)   Random.

(c) State three advantages of random file organization.   (3 marks)

19. State four file processing methods in a computer.   (4 marks)

20. State why it is important to have the following computer file components: Beginning-of-file marker and End-of-file marker.   (1 mark)

21. Differentiate between "Serial access" and "Direct access". Give an example of a storage media in each case.   (4 marks)

22. A serial file comprises of records placed in positions 1 to 10. State the position of the end of file marker.   (1 mark)

PROGRAMMING

SECTION A:

1. Define the following terms: (6 marks)

    i)   Computer Program
    ii)   Programming.
    iii)   Programming language.
    iv)   Program portability.
    v)   Algorithm
    vi)   Pseudocode.

2. (a) What are low-level languages? Give their features.   (4 marks)
    (b) State 2 advantages and disadvantages of low-level languages.   (4 marks)
    (c) Identify two types of Low-level languages.   (2 marks)

3. Distinguish between Machine language and Assembly language.   (2 marks)

4. Most computer programming is carried out using High-level languages.

    (a) What are High-level languages?   (2 marks)
    (b) Give three features of high-level programming languages.   (3 marks)
    (c) Give three advantages of High-level languages as opposed to Low-level languages.   (3 marks)

5. List three considerations which are present in Assembly language programming but not in high-level programming.   (3 marks)

6. (a) Examine two features of fourth generation languages (4GLS)   (2 marks)

(b) Highlight four advantages of fourth generation languages (4GLS)   (4 marks)
(c) List three examples of fourth generation programming languages.   (3 marks)

7. Describe the main feature of fifth generation languages.   (1 mark)

8. (a) Define the term Object-Oriented programming.   (2 marks)
   (b) List two examples of:

   (i)   third generation languages   (2 marks)
   (ii)   object oriented languages.   (2 marks)

   (c) Give an advantage of using an object-oriented programming language.   (1 mark)

9. Explain the meaning of the following as used in computer programming.   (2 marks)

   (ii). Syntax
   (iii). Semantic

10. Describe 5 factors to be considered while choosing a programming language. (5 marks)

11. Differentiate between the following as used in programming:

    (a) Source program and object code.   (1 mark)
    (b) Flowchart and Pseudocode.   (2 marks)

12. What does the following abbreviations stand for: (2 marks)

    i)   FORTRAN
    ii)   COBOL
    iii) OOP

13. (a) Define a Language translator.   (1 mark)
    (b) What is the purpose of the following translator programs?

    i)   Assembler.   (1 mark)
    ii)   Compiler.   (1 mark)
    iii) Interpreter.   (1 mark)
    (c) For each of the following programming languages, give their respective translators.
    (2 marks)
14. Give *two* advantages of compiling a program rather than interpreting it.   (2 marks)

15. Outline the seven stages in program development cycle in their logical sequence. (7 marks)
16. In program development cycle, what takes place in:

    (a) Problem definition.   (1 mark)
    (b) Program documentation.   (1 mark)

17. Give two reasons why it is necessary to have a program design.   (2 marks)

18. Using illustrations, explain at least six symbols used in flowchart design.   (6 marks)

19. (a) Identify and briefly describe two types of flowcharts.   (4 marks)
    (b) State any four rules you would follow when: (8 marks)

    i)   Writing a pseudocode.
    ii)   Drawing a flowchart
    (c). Give *two* advantages of pseudocodes over flowcharts.   (2 marks)

20. Define the following types of computer program errors:

    (a) Syntax error.   (2 marks)

(b) Logical error.   (2 marks)
(c) Run-time (Execution) error.   (2 marks)
(d) Semantic error.   (2 marks)

21. What do you understand by the following terms:

(a) Dry running.   (1 mark)
(b) Structured walkthrough.   (1 mark)
(c) Test data.   (1 mark)
(d) User Defined Function/ Procedure (UDF)   (1 mark)

22. (a) What is Program Documentation?   (2 marks)
    (b) In what stage of the development does program documentation take pace? (1 mark)
    (c) State two reasons for documenting all the stages of program development. (2 marks)
    (d) Describe three types of program documentation in reference to programming. (6 marks)

23. Briefly explain the purpose of the following types of program documents.   (3 marks)

(i).   User manual/guide
(ii). Reference guide
(iii). Quick reference guide.

24. (a) Explain the meaning of Program control structures.   (2 marks)
    (b) State the three basic types of program control structures.   (3 marks)
    (c) Draw simple flowcharts to illustrate the following program control structure:

    i).   The Nested IF selection
    ii).   The FOR loop
    iii). REPEAT…UNTIL loop.   (3 marks)

25. Name the control structure depicted by the flowchart below.   (1 mark)
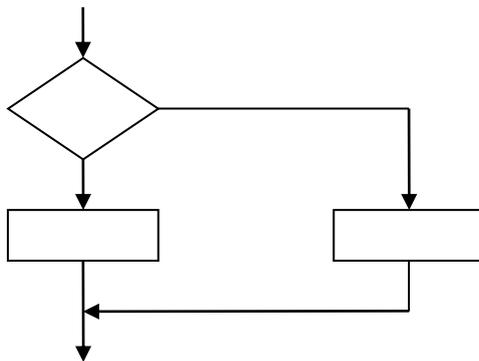
26. Highlight *two* disadvantages of monolithic programs.   (2 marks)

27. (a) Define the term Structured programming.   (2 marks)
    (b) List any two characteristics of Structured programming.   (2 marks)
    (c) Give two benefits of Structured programming.   (2 marks)

28. Structured programming language and Object-oriented programming language are the two
    main forms of high-level languages. State the difference between the two?   (4 marks)

29. (a) Define the term *Selection* in relation to program control structures.   (1 mark)
    (b). List four selection control structures used in writing a program.   (4 marks)

30. State four features of a user-friendly program.   (4 marks)

SECTION B:

1. Draw a flowchart for a program that would enable the user to enter student marks. The program should then determine whether the mark entered is a pass or fail given that the pass mark is 50.   (5 marks)

2. Write a pseudocode that reads temperature for each day in a week, in degree celcius, converts the celcius into Fahrenheit and then calculate the average weekly temperatures. The program should output the calculated average in degrees Fahrenheit.   (5 marks)

3. Draw a flowchart to be used to develop a program to calculate the Area and Perimeter of a Rectangle. The user is required to input the Length and Width of the rectangle after which she then chooses either to calculate area or perimeter using the input data. The program then outputs the results of the chosen calculation.   (8 marks)

4. (a). Develop a Pseudocode which will simulate the processing of Student's report. The simulation should be such that the user <u>repeatedly inputs</u> marks per subject for six subjects using a looping control structure. The computer processes the total marks and mean score of the student.

   Note. 1. It is assumed that the student does six subjects.
         2. The outputs required are; Average score and Total marks.   (5 marks)

   (b). Draw a fitting flowchart for question 1 (a) above.   (5 marks)

5. Study the following flowchart diagram.
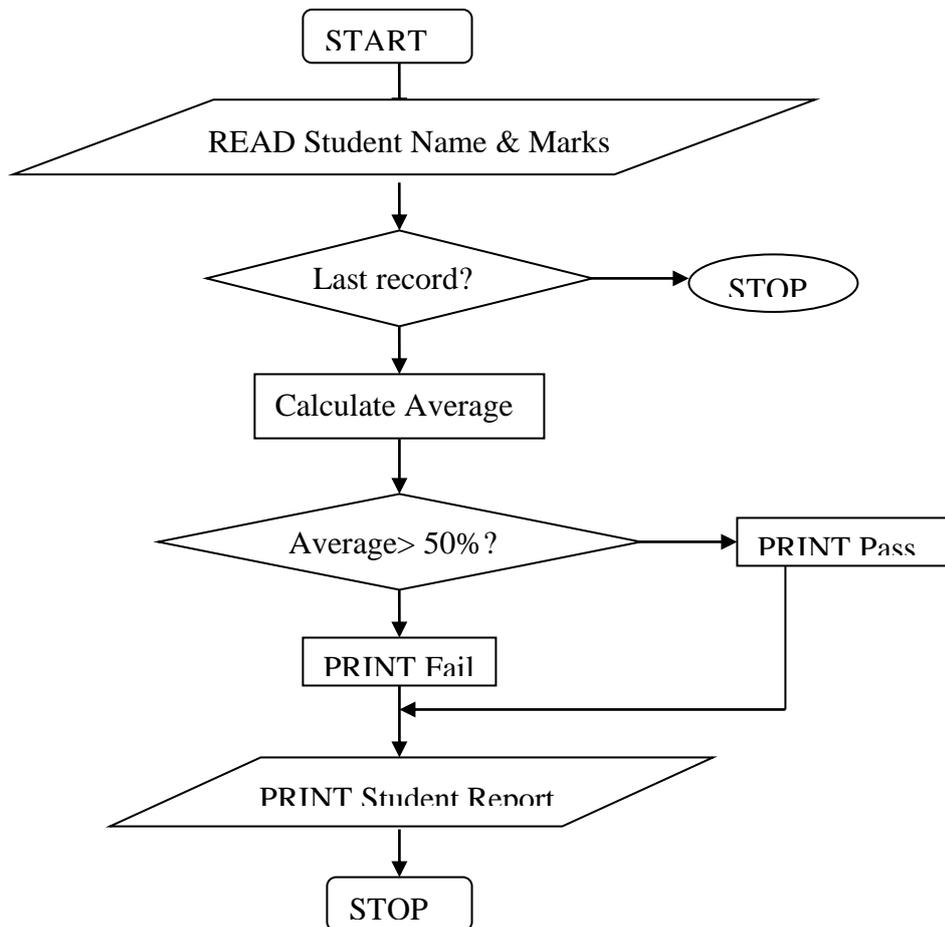
i) Identify three problems with this flowchart (3 marks)
ii) Describe briefly what this program is supposed to do. (2 marks)
iii) Modify this flowchart using a loop such that it processes a number of students records starting with the first until there are no more student records. (3 marks)

6. Mwalimu Savings Society (MSS) pays 5% interest on shares exceeding 100,000 shillings and 3% on shares that do not meet this target. However, no interest is paid on deposits in the member's MSS bank account.

   (a) Design a pseudocode for a program that would:

   i). Prompt the user for shares and deposit of a particular member.
   ii). Calculate the interest and total savings.
   iii). Display the interest and total savings on the screen for a particular member of the society. (7 marks)

   (b) Draw a flowchart for the above pseudocode. (8 marks)

7. The following is a Pseudocode developed for processing employees' payslips. Read through the Pseudocode carefully, then draw a fitting flowchart. (5 marks)

Start
    Initialize employee count to 0
    Open employee file
    Repeat
            Read employee record
            Compute gross pay
            Compute deduction amount

Compute net pay
Output employee ID, gross pay, deduction, and net pay
Add 1 to count
Until end of employee file
Close employee file
Stop

8. A man deposits 1,000 in a bank at an interest rate of 10% per year. At the end of each year, the interest earned is added to the amount on deposit and this becomes the new deposit for the next year.
Develop a pseudocode to determine the year in which the amount accumulated first exceeds 2,000. Also for each year, print the year (starting from 1), the deposit, the Interest earned, and the total accumulated at the end of the year.

9. Classify the following examples in any of the three program control structures. (3 marks)

i)   Statement 1
        Statement 2
        .
        .
        Statement n

    …………………………...………………………………………………………...……

ii)   IF YourMarks > Mean THEN
            PRINT Universal Donor
        ELSE
            PRINT UniversalReceiver

    …………………………...………………………………………………………...……

iii)   WHILE ExamTime Is Not Over
            Read question carefully
            Understand question
            Think clearly
            Answer appropriately
        ENDWHILE

    …………………………...………………………………………………………...……

10. Show exactly what is printed (output) by the following program: (3 marks)

PROGRAM MockExam (Input, Output);

CONST

    Adjustment = 5;

VAR A, B, C: Integer;

Begin

    Readln (A, B, C);

    A: = A*B+A+Adjustment;

    B: = B+Adjustment;

Writeln ('The Answers are', B, C, A, Adjustment);

END. (*PreExam*)

Use these data items: *1 2 3* as test for a, b, and c respectively.

…………………………...………………………………………………………………...…………

…………………………...………………………………………………………………...…………

11. Study the flowchart diagram below and answer the questions that follow:


```
            Start
              |
              v
         Sum: = 0
         R: = 0
              |
              v
         R = R + 1
         TERM: = R + (2)^R
         SUM: =SUM + TERM
              |
              v
                        NO
         R =3?  ----------->
              |
             YES
              |
              v
         PRINT Sum
              |
              v
            STOP
```
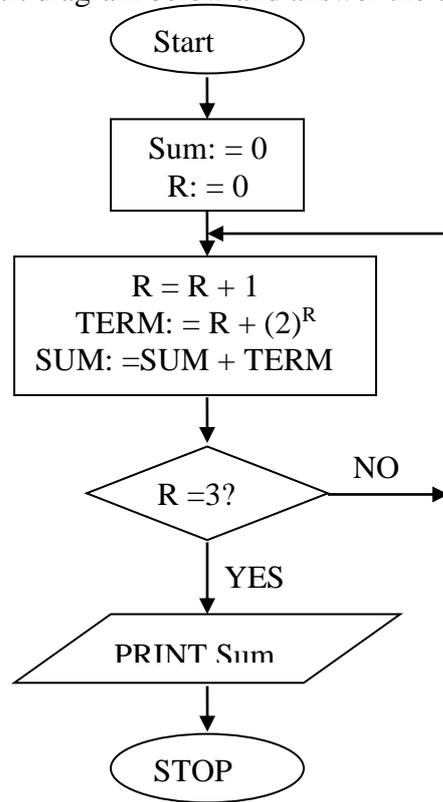
(a) What will be the value of sum when printed? Show your workings.   (5 marks)

(b) Write a Pseudocode for the above flowchart.   (10 marks)

12. A program is required for reading in a students' name and the scores obtained in two subjects. The output of the program will consist of the student's name, the two scores, the average of the two scores and a comment. The comment is based on the average as follows:

Average	Comment
>=70	Good
<70	Poor

Write a program to solve the problem using a high-level language.   (10 marks)

13. Draw a flowchart that will read a number N and then output the sum of squares from 1 to N.
                                                                        (10 marks)

14. (a) Draw a flowchart that can be used to write a program for displaying the first 1000 integers in the series of 2, 4, 6….   (7 marks)

(b) Modify the flowchart to sum up the numbers in (b) i above.   (3 marks)

15. The gross salary of employees of Mutson Chemist is based on the Basic salary and additional benefits. Employees with more than 10 year's experience get an additional pay of 10% of their basic salary. Bonuses are given as per employees sales of the month as:

Teacher.co.ke

>200,000	15%
100,000 – 200,000	10%
Below 100,000	5%

Draw a flowchart for the program that will calculate Gross salary and output each employees Basic salary, Gross salary and all benefits. (15 marks)

16. The following flowchart can be used to list the even numbers between 1 and 100 inclusive.
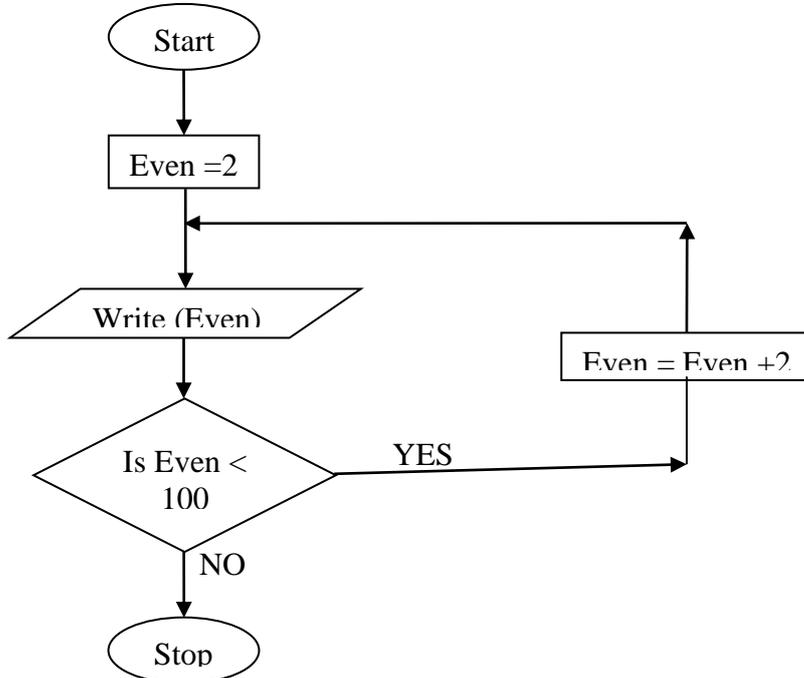
(a) What will be the output from the flowchart if the statement in the decision box is changed to: (6 marks)

  (i) Even = 100
  (ii) Even =< 100
  (iii) Even > 100.

(b) Modify the flowchart so that it prints the sum of all the even numbers between.
  (5 marks)

(c) Suppose a 10 element array A contains the values 9, 10, 5, 6, 7, 1, 0, 20, 21, and 11. Find the values in A after executing the loop below. (4 marks)

REPEAT for K = 1 TO 10
Set A [K + 1] = A [K]
End Loop

17. Bidii wholesalers has two categories of customers for order processing. Category 'A' obtains 10% discount on all orders up to Ksh. 10,000 otherwise the discount is 20% on the entire order. Category 'B' obtains 30% discount on all orders if the debt repayment is 'good' otherwise the discount is 15%. Draw a flowchart for the order processing. (15 marks)

18. (a) State the stage of program development in which: (2 marks)
  (i) a flowchart would be drawn

  (ii) the programmer would check whether the program does as required

  (iii) the user guide would be written

  (iv) the requirements specifications would be written.

(b) State the output of the following flowchart segment.

```
         │
         ▼
    ┌──────────┐
    │  A = 30  │
    └──────────┘
         │
         ▼
    ┌──────────┐
    │  B = 28  │
    └──────────┘
         │
         ▼
    ┌──────────┐
    │  B = A   │
    └──────────┘
         │
         ▼
    ┌──────────┐
    │  A = B   │
    └──────────┘
         │
         ▼
    ╱──────────╲
   ╱  Write A, B ╲
   ╲──────────────╱
         │
         ▼
```
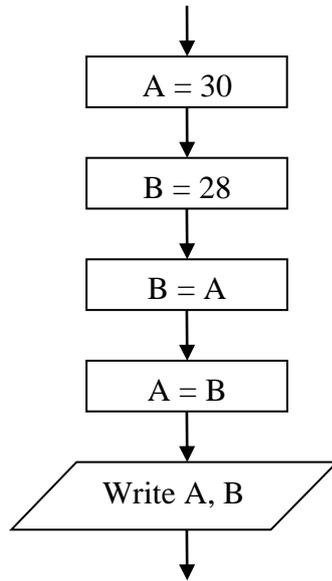
(2 marks)

(c) Draw a flowchart to compute the combined resistance (R) of two resistors R_1 and R_2 in parallel using the formula;

$$R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}$$

(5½ marks)

19. Draw a flowchart to compare three non-equal numeric values A, B, C and print the largest of the three. (11 marks)

SYSTEMS DEVELOPMENT

1. (a) What is a System? (2 marks)
    (b) Differentiate between soft systems and hard systems. (2 marks)
    (c) Explain five characteristics of a system. (5 marks)

2. (a) Define the term *Information system*. (2 marks)
    (b) State and explain three purposes of information systems in organizations. (3 marks)
    (c) Highlight three circumstances that necessitate the development of new information systems. (3 marks)

3. State four roles played by an Information system analyst. (4 marks)

4. Define the following terms:

    i)   System control.
    ii)   System boundary.
    iii) Online analytical processing.

5. Explain three system development theories and methods. (6 marks)

6. (a) State one disadvantage of the Traditional approach in system development. (1 mark)

(b) State one advantage and one disadvantage of Rapid Application Development method.
(2 marks)

7. (a) Define the term *System development lifecycle*. (2 marks)

   (b) Outline seven stages followed when creating an information system. (7 marks)

8. (a) Define the term Feasibility study as used in system development. (2 marks)
   (b) List four contents of a feasibility study report. (4 marks)

9. Your school has a plan to acquire and install computers.

   (a) List six criteria considered when deciding between the various computer suppliers who have submitted their tenders. (6 marks)
   (b) The school's Board of Governors has employed an independent expert to carry out the feasibility study of the project. List four essential components of this study. (4 marks)
   (c) State any five in-depth fact findings about the existing school system. (5 marks)

10. (a) State the importance of information gathering (fact-finding) in system development.
(2 marks)
    (b) State four methods that can be used to gather information during system development.
(4 marks)

11. (a) Identify two advantages and two disadvantages of Observation method used in fact-finding. (4 marks)
    (b) State two advantages and two disadvantages of the Interview method when used for information gathering. (4 marks)

12. Explain the concept of *Proxemics* in interviews. (1 mark)

13. (a) State three merits and three demerits of using a questionnaire in information gathering.
(6 marks)
    (b) Name *three* circumstances in which it is better to use a Questionnaire than an Interview for gathering information. (3 marks)

14. (a) Explain the importance of using Automated methods in fact finding. (1 mark)
    (b) Give one example of Automated information gathering technique. (1 mark)

15. Mention the four areas that are considered during the requirements specification stage.
(4 marks)

16. Explain three factors that should be considered during output design. (6 marks)

17. (a) State four factors that may be considered in order to design a good file. (4 marks)
    (b) Explain why it is important to consider file backup and recovery strategies during file design. (1 mark)

18. Define the term "Attribute" (1 mark)

19. Outline three factors that should be considered when sourcing for hardware and software resources required for a new system. (3 marks)

20. State two methods/tools that a system Analyst may use to design a system. (2 marks)

21. (a) Differentiate between a System flowchart and a Program flowchart. (2 marks)
    (b) Draw four system flowchart symbols and explain their functions. (4 marks)

22. Explain three tasks that are carried out during system implementation. (3 marks)

23. (a). What is systems documentation. (2 marks)
    (b) In the context of information systems development, illustrate the significance of systems documentation. (8 marks)

(c) List any four tools that systems analysts may use to document their findings or design options during Systems analysis and design. (4 marks)

(d) Outline four contents of a User manual. (4 marks)

24. Most information systems are reviewed or critically examined 3 – 6 months after they have been implemented or put into operation.

i) State the purpose or objective of this review. (4 marks)

ii) List four areas of systems operation on which the review focuses. (4 marks)

25. The company you work for has decided to replace its inventory control system. The current system was implemented ten years ago but has restricted reporting facilities and has a text-based interface. As the project manager, you are now considering details of implementation. You have been advised that you should consider both 'Parallel running" and "direct changeover/conversion".

(a) Explain the following terms as used in program implementation: (2 marks)

i) Parallel running.
ii) Direct changeover

(b) Give one advantage of Direct changeover over Parallel running. (1 mark)

(c) Identify two main risks of direct changeover, and suggest how these risks might be reduced for the inventory control system implementation. (6 marks)

26. Your school wishes to replace the original filing system with an Information and Communication Technology (ICT) system.

(a) Name two things the school must be sure of before replacing the old system. (2 marks)

(b) Mention four problems that may arise incase the manual system is phased out completely and replaced with the ICT system. (4 marks)

(c) Give two advantages of running both the manual system and the ICT system simultaneously. (2 marks)

(d) Mention any two disadvantages of running the two systems simultaneously. (2 marks)

(e) Outline five basic qualifications of the IT manager should the school need to employ one. (5 marks)

FORM FOUR - NETWORKING & DATA COMMUNICATION

1. Define the following terms: (2 marks)

(i). Computer network.
(ii). Data communication.

2. (a) Describe the three methods of data transmission on a network. (3 marks)
(b) State the factors to be considered while selecting a data transmission system. (3 marks)

3. Differentiate between a MODEM and a MULTIPLEXER. (2 marks)

4. Differentiate between: (8 marks)

(a) A baseband and broadband signal.
(b) A Network server and a workstation.
(c) Remote client and remote host.
(d) Half duplex and full duplex transmissions.

5. A student typed an e-mail to send over the Internet through a modem working at a speed of 100 Mbps. Calculate the maximum number of characters that can be sent per second if each character consists of 8 bits. (2 marks)

6. Explain the meaning of the following terms as used in networking:

   (i). Baud. (1 mark)
   (ii). Baud rate. (1 mark)
   (iii). Band. (1 mark)
   (iv). Bandwidth. (1 mark)
   (v). Guard band. (1 mark)
   (vi). Broadband (1 mark)
   (vii). Base band (1 mark)
   (viii). Resource (1 mark)
   (ix). Server (1 mark)
   (x). Client / workstation (1 mark)
   (xi). Peer. (1 mark)

7. Explain three advantages and three disadvantages of computer networking. (6 marks)

8. (a) State the type of data communication media that could be used in an electronically noisy environment. (1 mark)
   (b) Explain your answer in (a) above. (1 mark)

9. (a) Examine the major characteristics of each of the three types of computer networks. (9 marks)
   (b) Briefly explain four important benefits of using Local Area Networks (LANs) at an institution such as a college. (8 marks)
   (c) List three differences between Wide Area Network (WAN) and Local Area Network (LAN). (3 marks)

10. (a) Define the term Transmission media. (1 mark)
    (b) Give two advantages and two disadvantages of each of the following network transmission media.

    i) Twisted pair cables.
    ii) Coaxial cables.
    iii) Fibre optic cables.
    iv) Wireless / Microwave / Radio transmission.

11. Explain the *line of sight principle* in wireless communication. (1 mark)

12. (a) Explain the function of each of the following on a network:

    i) Network Interface Card (1 mark)
    ii) Repeater (1 mark)
    iii) Gateway. (1 mark)

    (b) Differentiate between a router and a gateway as used in networking. (2 marks)

13. (a) Study the diagram below and answer the questions that follow:

B ⟶
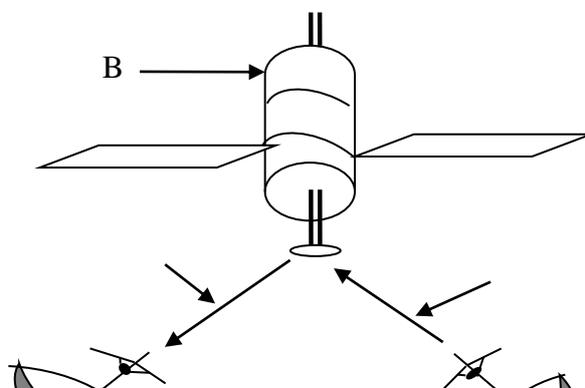
    C   D

  A

    i)   Name the communication media depicted in the above diagram.   (1 mark)
    ii)   Name the parts labelled A, B, C and D.   (4 marks)
    iii)   List three advantages of the above communication media.   (3 marks)

14. (a) Compare and contrast a Brouter and a Router.   (2 marks)
    (b) Give one disadvantage of a Hub on a network.   (1 mark)

15. (a) Define a computer terminal as used in a communication network.   (1 mark)
    (b) List any two items that may be referred to as Data Terminal Equipment in a network
        (2 marks)
    (c) Distinguish between an intelligent terminal and a dump terminal.   (2 marks)

16. (a) List two types of network software.   (2 marks)
    (b) Outline five functions of network operating system.   (5 marks)

17. (a) Give three examples of protocols used in networking.   (2 marks)
    (b) Outline the seven open system interconnection (OSI) reference model layers.
        (7 marks)

18. (a) Define the term Network topology.   (2 marks)
    (b) Distinguish between Logical and Physical network topology.   (2 marks)

19. State and briefly describe any five types of physical network topologies used in LAN.
        (10 marks)

20. (a). Briefly explain the following terms as used in networking: (2 marks)
    (i).   Remote communication.
    (ii).   Distributed processing.
  (b). State three advantages and two disadvantages of a mesh network topology. (5 marks)

21. (a) With the aid of a diagram, explain hierarchical (tree) network topology.   (3 marks)
    (b) List two advantages and two disadvantages of hierarchical network topology.
        (4 marks)

22. State the purpose of each of the following: (2 marks)
    (i)   file server software
    (ii)   communication software

23. (a) The diagram below shows four common network topologies A, B, C and D.
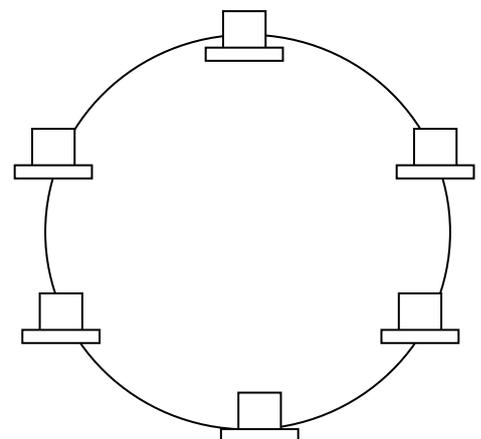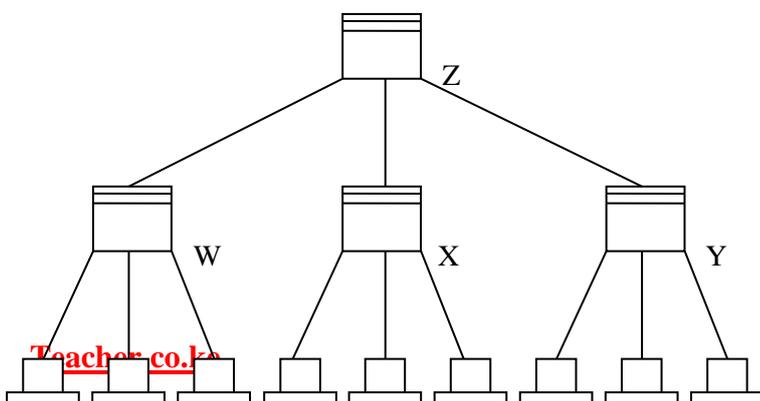
1 2 3 4 5 6 7 8 9

TOPOLOGY A

TOPOLOGY B

TOPOLOGY C

TOPOLOGY D

Server

Terminal

Printer

    (i)   Name the network topologies labelled A, B, C and D.   (4 marks)

    (ii)   Explain what happens if server X in topology A fails.   (1 mark)

    (iii) List two problems associated with network topology B.   (2 marks)

    (iv) List two disadvantages associated with network topology D.   (2 marks)

(b) Differentiate between Internet and World Wide Web.   (2 marks)

(c) Describe the following network services and identify their applications.

    (i)   Voice mail.   (2 marks)
    (ii)   Video conferencing.   (2 marks)

APPLICATION AREAS OF ICT

1. What is ICT? (1 mark)

2. Name the type of processing that would be required by a payroll system. (1 mark)

3. Outline two ways in which computers can be used in hotels. (2 marks)

4. State two ways on how Information & Communication Technology (ICT) can be used to reduce the spread of HIV/AIDS. (2 marks)

5. (a) Identify two benefits of using computers in accounting systems. (2 marks)

(b) List down any four modules within an accounting package, stating the purpose for each
(6 marks)

6. (a) List four functions of a computerized Stock control system. (4 marks)
   (b) Name two organizations that would benefit the most from computerized stock control systems. (2 marks)

7. (a) How is a point of sale terminal used in a business organization? (2 marks)
   (b) State four components of an electronic Point-of-sale terminal. (4 marks)
   (c) Give two advantages of using electronic point-of-sale terminals as opposed to manual entry at a supermarket checkout counter. (2 marks)

8. Write the following abbreviations in full: (4 marks)

   i) ATM
   ii) EFTPOS
   iii) CAD/CAM

9. Define the following terms:

   (a) Biometric analysis
   (b) Telecommuting
   (c) Video conferencing.

10. Outline four devices required in order to conduct a video conference. (4 marks)

11. With the improvement in price and performance of computers and communication equipment, it will be possible for people in various business organizations to work from home. Such working using a PC as a remote terminal is often described as teleworking. State three advantages and three disadvantages of working from home. (6 marks)

12. (a) Define the term *E-commerce*. (2 marks)
    (b) List down two advantages and two disadvantages of e-commerce as used in modern business environment. (4 marks)
    (c) Explain two ways in which ICT can enhance commerce. (2 marks)

13. (a) Explain the term "Virtual Reality" (2 mark)
    (b) List three areas where virtual reality is used. (3 marks)
    (c) List down four interactive sensory devices used in virtual reality. (3 marks)

14. (a) What is an Expert system? (1 mark)
    (b) State and explain any *three* components of an Expert system. (6 marks)
    (c) Identify at least two areas where Expert systems are used. (2 marks)

15. Describe how computing has been applied to each of the following areas:

    (a) Educational systems. (2 marks)
    (b) Transportation systems. (2 marks)
    (c) Financial systems. (2 marks)
    (d) Scientific research. (2 marks)
    (e) Entertainment systems. (2 marks)
    (f) Reservation systems (2 marks)
    (g) Law enforcement (2 marks)
    (h) Library management systems (2 marks)

16. State three areas where computers are used in financial systems: (3 marks)

17. Differentiate between:
    i).   An electronic point of sale terminal and a Cash register
    ii).   Computer aided instruction and Computer aided learning
    iii). Computer aided design and Computer aided manufacturing
    iv).   Teletext and Videotex
    v).   Simulation and Virtual reality

18. (a) Despite the introduction of the ATM card, human resource is still necessary in the banks. Give two reasons why humans are still needed. (2 marks)

    (b) State four advantages to the users of the cards. (4 marks)

    (c) Give two safety precautions that the card owners should observe to ensure security of their money. (2 marks)

19. (a) Define Process control. (2 marks)
    (b) Name four different industries where computerized process control systems can be found (4 marks)

20. Simulation is one of the application areas of computers.

    (a) What is meant by the term simulation? (1 mark)
    (b) Name two application areas of simulation. (2 marks)
    (c) State *three* advantages of computer based simulation. (3 marks)
    (d) Give two actual dangers in projecting using computer models. (2 marks)

21. (a) Define Computer Aided Design and Manufacturing (CAD/CAM) (2 marks)
    (b) List five features of CAD. (5 marks)
    (c) State any three areas where CAD is applied in the society today. (3 marks)
    (d) State one advantage of using CAD software. (1 mark)

22. (a). Explain the role of robots in a motor vehicle assembling plant. (1 mark)
    (b). Mention four areas where robots are used. (4 marks)
    (c). Identify two advantages of using of robots in industries. (2 marks)

23. (a) Explain how computers are used in the medical field. (2 marks)
    (b) In what ways have computers enhanced space exploration? (2 marks)

24. Give any three uses of computers in the shipping industry. (3 marks)

25. Suggest how computers may in future be made user-friendly for persons that are:

    (a) Blind. (1 mark)
    (b) Without hands. (1 mark)

26. Give at least four reasons why a firm may decide to computerize its operations. (4 marks)

IMPACT OF ICT ON SOCIETY

1. Identify four benefits that may be derived from increased use of information technologies. (4 marks)
2. Identify four problems associated with the introduction of computers in a society. (4 marks)
3. State two health issues that may result from prolonged use of computers. (2 marks)

4. (a) A recent breakthrough in the manufacturing industry is the development of a full manufacturing plant that can produce vehicles using robots only. Give three advantages and two disadvantages of fully automated manufacturing. (5 marks)

   (b) Apart from manufacturing, state three other areas where automation is applicable. (3 marks)

5. Computers have proved to be useful in many areas of life though with negative effects to the user.

   (i). State any two negative effects of computers to human health. (2 marks)
   (ii). State two practices that can be observed in order to ensure the safety of computer users. (2 marks)

6. Explain three ways by which computer users can protect their eyes from harmful emissions from the computer screen. (6 marks)

7. (a) Explain how the use of ICT may affect the environment. (3 marks)
   (b) Explain three ways in which computers have impacted on education. (3 marks)

8. (a) Define the term *artificial intelligence*. (2 marks)
   (b) Discuss the applications of Artificial Intelligence in each of the following fields:

   i) Expert Systems. (2 marks)
   ii) Natural language processing. (2 marks)
   iii) Artificial Neural Networks. (2 marks)
   iv) Robotics. (2 marks)

9. List and explain four advantages of using:

   i) A computerized system. (4 marks)
   ii) A database system. (4 marks)

10. ITCity Inc has been performing quite well in the past year. The management strongly feels that by automating all operations, the company will have a competitive edge. However, most of the staff and part of the management are strongly opposed to the idea of automating the company's operations.

    Required:

    (a) State and explain five reasons why the staff may be opposed to the idea of automating the company's operations. (6 marks)
    (b) List three ways in which this resistance may manifest itself. (3 marks)
    (c) How can this resistance be overcome? (6 marks)

CAREER OPPORTUNITIES IN ICT

1. Give a brief description of the following careers available in the computing field.

   i) Software engineers. (2 marks)
   ii) Database administrators. (2 marks)
   iii) Data Processing Managers (DPM). (2 marks)

iv)   Systems Analysts.   (2marks)
v)   Computer Programmer   (2 marks)
vi)   Network Administrators.   (2 marks)
vii) Computer Technicians.   (2 marks)
viii) Information Systems Managers.   (2 marks)

2. Outline the roles of a Network administrator.   (3 marks)

3. State the role of a computer Scientist.   (2marks)

4. Distinguish between:

   (a) A software engineer and a computer engineer.   (2 marks)
   (b) A system analyst and a programmer.   (2 marks)

5. List three types of job opportunities that are available in the field of computer hardware.
                                                                    (3 marks)
6. Identify three courses you would enrol in at the Post graduate university level. (2 marks)
7. (a) State three public universities where one can further her Computer Studies. (3 marks)

   (b) Identify at least three ICT related courses offered at

       i)   polytechnic level
       ii)   college level
       iii) university level

4. Explain three factors considered before joining an ICT course.   (2 marks)

5. Identify two external Examining bodies for Diploma and Higher Diploma in Computer

   courses.   (2 marks)

8. List three duties of the following personnel:

   (a). Database administrator.   (2 marks)
   (b). Data processing manager.   (2 marks)
   (c). Computer programmer.   (3 marks)

6. Name three responsibilities that are carried out by:

   (a) Web administrator.   (3 marks)
   (b) Computer Trainer.   (3 marks)

7. An employee in a business company is charged with the responsibility of putting the
    company advertisements on the internet.
   (i)   State the professional title of the employee.   (1 mark)

   (ii)   Give an example of software used by this employee to carry out the above task.
                                                                    (1 mark)

ROADMAP TO K.C.S.E: FORM 2 COMPUTER

STUDIES REVISION GUIDE (PAPER 1)

Teacher.co.ke

1. WORD PROCESSING

SUB-TOPICS	CONTENT
Definition of terms / Purposes of word processing	• Define the terms (a) word processing (b) a word processor. List 3 examples of word processors available in the market today. List 5 editing and 5 formatting features of a word processor. • Identify 6 advantages and 4 disadvantages of using word processor to prepare documents over a manual typewriter. • Write down 6 uses of a word processor. State any 3 factors to consider when choosing a word processor. • List down the 2 types of typing modes in a word processor.
Running a word processor / Creating a document	• Explain the uses of the following parts of Ms-Word application window (a) title bar (b) menu bar (c) rulers (d) work area (e) scroll bars. • Identify 2 uses of (i) horizontal ruler (ii) vertical ruler. • What is toolbar? Describe how toolbars help users of the word processor. • State the function of status bar. List down 4 types of information displayed in the status bar. • Clearly explain the meaning of (i) creating a document (ii) word wrap (iii) scrolling (iv) text deleting. • Describe 2 procedures of creating a new document using Ms-Word. • State the difference between templates and wizards as used in computers. Give 2 advantages of using a template to create a document. • Explain the functions of the following keys in word processing (a) Enter key (b) Backspace key (c) Delete key (d) Caps Lock key (e) Shift key (f) Tab key (g) Insert key (h) End key (i) Ctrl + Home (j) Page Down • Differentiate between soft return and hard return of the cursor in a document.
Saving of documents / Editing a document	• What is (a) saving a document (b) retrieving a document (c) closing a document. State 2 reasons for saving a document. Differentiate between (a) Save and Save As commands (b) closing a document and exiting from an application. • Give 3 reasons why one would retrieve a saved document. • Describe how you would set up automatic saving after every five minutes. • Define the terms (a) editing a document (b) selecting/highlighting of text (c) blocking of text (d) scrolling. State 3 operations that may require blocking in Ms Word. • Name the mouse shortcut for selecting the following (a) word (b) line of text (c) graphic (d) large block of text (e) sentence (f) multiple lines of text (g) paragraph (h) an entire document. • State the difference between (a) type over and insert mode (b) copying and moving text (c) Cut-and-Paste and Drag-and-drop editing. Explain how a paragraph can be moved from one area of a page to another. • State the use of the find and replace command. • What is a wildcard? How can wildcards be used to search for a word that starts with the letter "O" in a document?
Proofreading a document	• Define proofreading. State 2 importance of proofreading a document. List down 4 facilities used to proofread a prepared document. • What is Spelling and grammar checker? Give 2 importance of using the spelling and grammar checker. Explain 2 types of dictionaries used by the spell-checker program. Explain the use of the following buttons in spell-checking (a) Change (b) Change All (c) Ignore Once (d) Ignore All/Ignore Rule (e) Add to Dictionary. Give 2 reasons why it is important to add extra words to the dictionary when spell-checking. • What is Thesaurus? State 2 uses of Thesaurus. • Distinguish between the AutoComplete and AutoCorrect feature in word processing. • Explain the use of undo and redo commands.

Formatting a document	• What is document formatting? Give any 6 text formatting features. Describe the following terms (a) Boldface (b) Font type (c) Font size (d) Underlining (e) Italicizing (f) Changing font colour. What unit is used to measure Font size? • What is the difference between text editing and text formatting? • Differentiate between (i) bolding and highlighting text (ii) superscript and subscript. • Explain you would (i) Bold, italicize and double underline a block of text (ii) apply superscript or subscript to text. • List 6 paragraph formatting activities in word processing. • What is (a) Change case (b) Drop capping (c) Drop cap (d) Bullet. State the meaning of (i) Sentence case (ii) Lowercase (iii) Uppercase (iv) Title case (v) Toggle case. • State 2 functions of drop cap in a document. Highlight the steps taken to drop a letter. Differentiate between Dropped and In Margin as applied in drop capping. • State the importance of bullets and numbering in a document.
	• Define alignment. Name and explain 4 text alignment features. • Distinguish between line spacing and paragraph spacing. Explain 5 types of line spacing. • Outline how to create a page with two columns and a line between them. Explain how you would break from one column to another. • Define Indentation. Explain 4 types of paragraph indents. State the difference between first-line indentation and hanging indentation. • What is (a) a Tab (b) Tab stop (c) Tab spacing (d) Tab leader? Give 3 reasons for setting tab stops. Draw and name illustrations of any 3 types of tab stops that can be set in a document. • Distinguish between page margins and borders as used in word processing. State 2 importance of applying borders to a given text. • Explain how you would accomplish the following tasks (a) convert a paragraph to All uppercase (b) Insert bullets and numbering to a given list of items (c) apply a drop cap to a paragraph (d) apply a hanging indent to a paragraph (e) align text to the right margin. • State 6 page formatting features in word processing. • Define (a) Break (b) a Section (c) a Section Break. Identify 5 formatting elements that can be set for sections. Explain 4 types of section breaks. • What is a Page Break? Distinguish between (a) a soft page break and a hard page break (b) an orphan and a window.
	• Name 4 things that are carried out during page setup in Ms-Word. Explain the difference between a header and a footer. • State 2 importance of setting page margins. Explain the following types of page margins (a) top margin (b) bottom margin (c) left margin (d) right margin (e) gutter (f) mirror margins (g) book fold. • What is the difference between a page header and a page title? How would you insert footer to your document? • Give 2 reasons why you should specify the correct paper size before printing a document. • What is page orientation? Name and explain 2 methods of paper orientation. Name the appropriate orientation for (a) a large print name sign for a classroom (b) a price list in a shop. • Explain the importance of page numbers in a document. How can you insert page numbers in a multipage document when working with Ms-Word?

Creating and editing a Table	• Define a table as applied in Ms Word. Define the following terms while working with tables (i) Cell (ii) Row (iii) Column. Give 3 importance of creating tables in word processing. • Differentiate between (a) Drawing and inserting a table in a document (b) Clearing a table and deleting a table (c) Splitting of table cells and splitting a table. • What would happen to the text cursor when the following actions are done in a table (a) press the Tab key (b) press the Enter key (c) press the Shift + Tab key. • Define the term 'merging of cells' as used in tables. Give 2 reasons for merging cells in a table. • Outline the steps to be followed in order to (i) merge cells in a word processing table (ii) Insert a blank row in a table (iii) Delete two rows from a table (iv) Add borders around a table. • What is a function when working with calculations in word processing? List 4 paste functions that can be used to perform mathematical calculations in a word processing table. • List 4 arithmetic operations that can be performed on a row of numeric data in a word processing table. Write the expression used in each case. Define the term 'sorting text.'
Mail-merging / Inserting graphics	• What is the meaning of mail merging? Give 2 advantages of using mail merge. State the difference between main document and data source in mail merge. • Outline 3 basic steps required to mail merge a document. List 4 ways of merging a document with its data source. What 3 types of documents are created by the user in mail merge? • Define the term 'graphic'. Give 3 types of graphics used in a word processor. List any 3 sources of graphics in Ms-Word. • What is ClipArt? Apart from ClipArt, name 2 other sources of graphics. • What is (i) AutoShape (ii) Textbox (iii) WordArt? Give 2 advantages of using a Text Box to write the text in an advertisement. • Explain the concept of importing objects into a word processor. What is the difference between object linking and embedding? • Explain how you would do the following tasks (i) Enter text into an AutoShape (ii) Insert a Clip Art picture into a document (iii) Fill a drawing object or an AutoShape with colour (iv) Change the brightness of a graphic (v) Change the thickness of an AutoShape outline (vi) increase the size of a Clip art.
Printing a document	• What is printing? Explain 4 reasons for previewing a document before sending it to the printer. • In word processing, what is a hard copy? Why do we need a hard copy? • Explain the difference between printing of multiple pages and printing of multiple copies of a document. • In printing, what is to collate a document? State 1 advantage and 1 disadvantage of collating a document. • Show how you can print a document with the following conditions: (a) pages 2, 3, 6 to 10, 13 to 20, 23 and 28 (b) a quick printout for temporary use. • The printer is producing funny characters when you order Word to print the worksheet. What could be the most likely problem? • Name 4 functions performed by a word processor.

2. SPREADSHEET

SUB-TOPICS	CONTENT

Definition of a spreadsheet / Components of a spreadsheet / Application areas of a spreadsheet	• Define a spreadsheet. Distinguish between a manual worksheet and electronic spreadsheet. State 5 advantages of electronic spreadsheets over manual worksheets. Give any 4 application programs classified as spreadsheets. • Name 3 components of a spreadsheet. Distinguish between (a) workbook and worksheet (b) sorting and filtering. • Explain 5 application areas of spreadsheet software. What is automatic recalculation? • Describe any 5 features (advantages) of electronic spreadsheet software. State 5 features that make spreadsheet useful in calculating the wages of the employees in a company.
Creating a workbook	• Name the operating system environment in which Ms-Excel operates. Explain 3 methods used to start Ms-Excel. • Explain the purpose of following Excel elements (a) Formula bar (b) Name box (c) Active cell (d) Column identifiers (e) Row identifiers (f) Gridlines (g) sheet tabs. • Give 4 common File features between a word processor and the spreadsheet. • Explain the following worksheet terms (i) rows (ii) columns (iii) cell (iv) range. List 4 types of information that can be entered into a worksheet cell.
Cell data types	• Explain 4 types of data in spreadsheet. Define (a) function (b) formula (c) value (d) label (e) range. State 4 actions that can be performed on ranges in Ms-Excel. • Describe 2 ways to complete an entry into a cell. Describe the procedure to be followed when entering (a) a negative number in a cell (b) a fraction in a cell. • How does Ms-Excel determine that an entry is a text or a formula? Any entry that is not a number or a formula in a spreadsheet is treated as a label. State any 2 rules that a label must conform to. Explain how you would write the number 0005 as a label. • Format the number 34567.123 in three distinctive ways that convey different meanings. Write the date 11th May 2009 in any 3 formats in a cell. • Briefly explain the concept of AutoFill. • State one way a user may reverse the last action taken in a spreadsheet package. • State the effect of pressing the following key combinations on the cell pointer (i) Right Arrow key (ii) SHIFT+TAB (iii) CTRL+HOME.
Cell referencing	• What is a cell reference? Explain 4 types of referencing methods used in spreadsheets. • What is a name reference? How can you accomplish this in Ms-Excel? • Differentiate between (a) single and multiple cell referencing (b) relative and absolute cell referencing. • Write the equivalent R1C1 reference for G20. Write the formulae =F10 + G20 as absolute. For each of the following, state the type of cell reference (i) A5 (ii) F5 (iii) H$21 (iv) $D7. • The formula =B5+C4 was entered in cell F5. What will it become when it is copied to cell H8? Explain the reason for your answer. • The formula = $C2 + C$3 is entered in cell C5. Write down the formula as it appears when is copied to D10. • The formula = K20 + P$18 was typed in cells L2. Write the formula as it will appear when copied to cell M24.

Basic functions and formulae / Editing of worksheet	• Define the terms (a) operator (b) operand (c) operation. • What is a function? List 4 mathematical functions provided by Ms-Excel. State the role of the following spreadsheet functions (a) Sum (b) Product (c) SQRT (d) Round (e) Today ( ) (f) Average (h) Max (i) Count (j) IF (j) SumIf (k) CountIf. • Compute (i) 37 DIV 5 (ii) 37 MOD 5. Calculate the output from the following, given that X = 4 and Y =2 (i) X DIV Y (ii) X MOD Y. • Write down a function to calculate the mean of a range of values in cells B1 to B10. • Write down the formula that would be entered at cell B7 to sum the values in column A1 to A3 whose values are greater or equal to 15. • Explain the meaning of the following errors as displayed in worksheet cells (a) #VALUE! (b) #NAME? (c) #N/A (d) #NUM! (e) #REF! (f) #DIV/0! Show how we can solve them. • Describe 2 methods of copying a formula. • Explain step-by-step how you would (a) select a range of cells (b) select non-contiguous cells or cell ranges (c) edit cell contents. • Differentiate between (a) copying and moving data in a worksheet (b) clearing cells and deleting cells. Describe 2 ways of erasing the contents of a cell in a worksheet.
Worksheet formatting	• What is worksheet formatting? State 2 importance of worksheet formatting. List 4 formatting features provided by Ms-Excel. • Explain 2 ways of changing the font size in Ms-Excel. • State 2 conditions under which a worksheet cell would display # # # # # #. How can this problem be rectified? • Explain step-by-step how you would (a) adjust a column width to accommodate the longest cell entry in a range of cells (b) insert rows in a worksheet (c) make text in a worksheet cell bold, italic and double-underlined. • Identify 2 reasons for hiding columns in a worksheet. • What are worksheet borders? State 3 importance of adding borders in worksheet cells. Explain how to add borders in worksheet cells. • What is the AutoFormat feature? Give 3 number formats in Ms-Excel. The number 435273.7865 is entered into a cell. How will the number look like if the cell is formatted as commas and 2 decimal places?
Data management / Creating of Charts and Graphs	• Explain 4 data management functions of a spreadsheet. What is meant by the following terms (a) sorting (b) filtering data? Identify 2 importances of data sorting. • Briefly describe the importance of "What-if analysis" in spreadsheets. • What is a chart? State the major function of charts in spreadsheets. List any 4 types of charts in Excel and give the purpose of each. • What is a chart wizard in spreadsheets? Outline the steps required when creating a simple chart. • Explain the following terms as used in charts (a) data series (b) data ranges (c) data labels (d) axis (e) legend. • Distinguish the purpose of (i) a title and legend (ii) chart title and axis title. • Differentiate between an embedded chart and a chart sheet. Explain how you can change the chart type in Excel.
Printing / Managing worksheets	• State 3 importance of setting the page setup. • State the difference between printing a range and printing a whole workbook. • What is orientation? Differentiate between landscape and portrait orientation. Explain how you would (a) print a worksheet in landscape orientation (b) print a portion of an Excel worksheet. • State the importance of printing gridlines around worksheet cells. • By default, how many worksheets are there in a workbook? Explain how you would do the following operations on a worksheet in Ms-Excel (a) insert a single new worksheet (b) move from one worksheet to another (c) rename a worksheet (d) delete a worksheet

3. **DATABASES**

SUB-TOPICS	CONTENT
Definition of Database / Database Concepts / Data Organization	• Define a database. Explain 5 importance of using DBMS in organizations. • Briefly describe the traditional file management system. State 4 limitations of using the traditional method of data management. • What are database management system software? What is the difference between PC-based databases and corporate databases? List 4 commercial database programs that may be installed in a computer. • Identify 6 functions of a DBMS. State 4 advantages and 2 disadvantages of using an electronic database system. • Briefly explain database maintenance. List 3 tasks involved in the maintenance, and briefly explain how each is done. • What is a database model? Explain following types of database models (i) flat file database (ii) relational model (iii) hierarchical model (iv) network model (v) object-oriented model. Distinguish between flat file and relational databases. Identify 3 advantages of the relational database system. What are the disadvantages of using (a) hierarchical database systems (b) network database systems?
	• Distinguish between (a) entity and attribute (b) primary key and foreign key. State 2 properties of a primary key. State 2 importance of a primary key in a database. • What is a relationship in a database? Using diagrams, describe the following types of relationships applied (i) one-to-one (ii) one-to-many (or, many-to-one) (iii) many-to-many. • Explain how 'parent' and 'child' tables are related in relational database. • What is the usefulness of data integrity? What is referential integrity as used in database? Explain what happens when invalid data is entered into a related table for which referential integrity has been reinforced. • Outline 5 features of an electronic database management system. • Arrange the following components of the database hierarchy in ascending order of complexity: Field, Database, Record, Character and File. Explain each of the components.
Creating and editing a database	• State the use of the following database objects (a) Tables (b) Queries (c) Forms (d) Reports (d) Modules. • State the procedures followed when designing a database. List 4 factors to consider when designing database files. • Define the following terms as used in database design (a) redundancy (b) normalization. State 3 objectives of normalization. • Distinguish between (a) primary key and index (b) input mask and design (c) record and field (d) field name and caption. • When do you use the following field data types? (a) Text (b) Memo (c) Date/Time (d) Number (e) Currency. • What are field properties? Name and explain 4 field properties used in table design in Ms-Access. • A teacher keeps the following student details in a database: Name, Adm No, Gender, Date of birth, Address, Town, Marks scored, Fees paid, Pictured (scanned); (i) Indicate the appropriate data type for the fields (ii) name the most appropriate primary key. Give a reason. • Define the terms (a) sorting of records (b) filtering of records (c) freezing of columns.

Form Design	• Define a form. Describe any 4 reasons for using forms. • What are controls? Explain the following types of controls used in forms (i) Label (ii) Textbox (iii) Command button (iv) List box (v) Check box/Option button or Toggle button. • Explain when the following controls are used (a) Bound (b) Unbound (c) Calculated. Distinguish between bound and unbound controls. • Explain the following form layouts (a) columnar form (b) tabular (c) datasheet (d) justified. • Give the difference between the following in form layout (i) Form Header and Page Header (ii) Form Footer and Page Footer. • Explain how you would move from one record to another in a form. • Explain 3 advantages of using input screens compared to entering data directly to a table.
Queries	• What is a query? Outline 3 uses of a query in database design. • Differentiate between (a) a table and a query (b) an action query and select query. Explain 4 types of action queries. • Explain the following parts of the query design grid (i) Field row (ii) Show row (iii) Sort row (iv) Criteria row. • Explain how you would (a) sort data in a query (b) Create a select query that can calculate total score and average in ten subjects. • Giving examples, describe the use of the following logical operators in queries (i) AND (ii) OR (iii) Between (iv) Wildcards (v) Not. • Write down the criteria you would use to display employees' details from a payroll database who earn between 80000 and 200000. • The following car details are to be entered in a database: Make, Date-of-manufacture, colour, and cost; (a) prepare a suitable database structure showing field names and their field data types (b) write a statement that can be used to select cars of colour green (c) give an instruction that would (i) select cars whose cost is between 500000 and 1000000 (ii) determine the average cost of all cars.
Reports layout / Automating the database / Database security	• What is a report? State 2 importance of a report generated from a database. • What is a report wizard? Explain how you would create a report that displays subtotals and grand totals. • Explain the following parts of a report layout (i) Report Header (ii) Page Header (iii) Detail (iv) Page Footer (v) Report Header. • Describe the following tools used to automate a database in Ms-Access (a) Switchboard (b) Macros. Give 4 advantages of using macros. • List any 4 methods used to secure data in a database.

4. DESKTOP PUBLISHING

SUB-TOPICS	CONTENT
Definitions / Purpose of DTP / Types of DTP software	• What do you understand by the following terms (a) Publishing (b) Desktop publishing? • Mention the 3 main purposes of DTP software. • What is (a) layering (b) artwork? Why is layering very useful in a desktop publisher? • What is Desktop Publishing software? State and briefly explain the 2 main types of DTP software, and give 3 examples of each type. • State 4 application areas of DTP software. • What is a publication? Name any 6 types of printed publications that can be created with DTP software. • What information do you normally find on a business card? What is the main difference between a newspaper and a newsletter? • Explain 6 features of DTP software. Give 2 reasons why DTP software is preferred in designing documents than a word processor.

Designing a publication / Editing a Publication	• List any 4 application window layout components found in a typical desktop publisher. • Differentiate between (a) pasteboard and printable page (b) an inside margin and an outside margin. • Explain the functions of the following tools as used in DTP (a) Text tool (b) Pointer tool (c) Cropping tool (d) Rectangle tool (e) Rotate tool (f) Zoom tool. • What is a text frame? State the purpose of frames. Explain how you would create text using (a) Text tool (b) Text frame. • Explain what is meant by a master page? Why are master pages important in a publication? • What commands are used in place of portrait and landscape page orientation in PageMaker? • Define the terms (a) editing a publication (b) story. • Explain 2 editing tools in DTP. State the purpose of the following spell-check options (i) Change To (ii) Ignore (iii) Replace (iv) Add.
Formatting a Publication	• Define formatting of a publication. • What is a control palette? How would you use a control palette to format (a) Characters in a text (b) Paragraphs. • Explain how you would change the boldface and the font size of selected text at once. What is a leading? • Distinguish between (a) tracking and kerning (b) superscript and subscript (c) change case and drop cap (d) fill and stroke. • State 3 ways of moving round the page in a DTP window. • What are non-printing guides? List down 3 nonprinting guides used in a desktop publisher. Distinguish between margin guides and column guides. • Why do we need ruler guides when creating a publication? How do you (a) place a ruler guide in the pasteboard (b) hide a ruler guide from the pasteboard? • What does the term gutter mean in relation to column setting?
Working with Graphical objects / Working with Tables / Printing	• Give 3 methods that are used to transform an object. Distinguish between fill and stroke. • What is text wrap? Explain the concept of wrapping text around objects. Give 3 ways you can wrap text on an object. • Explain the following graphic terms (a) crop (b) rotate (c) object grouping (d) locking an object. Give a real life example of using cropping. In what way is cropping different from resizing? Explain why you would need to lock margins or objects in a publication. • What is the use of Tables in a publication? Explain how you can create a Table with 5 rows and 3 columns. • How would you ensure that all text typed in a cell remains visible? What option is used to make row 1 of a Table into single cell?

5. INTERNET AND E-MAIL

SUB-TOPICS	CONTENT
Definition of Internet / Development of Internet	• What is (a) networking (b) a network (c) a computer network. State 3 examples of communication networks. Briefly explain 3 basic types of computer networks. • Precisely define what an internet is. Why is the internet referred to as an information superhighway? • Differentiate between internet and intranet. • Discuss the growth of Internet in recent days. What was the original intention of creating the Internet? Who runs the Internet? Describe the first Internet network in terms of its name, the sites connected and link speeds. Describe 3 functions of the Internet.

Teacher.co.ke

Internet connectivity	- Name 5 facilities that are needed to connect to the Internet. Explain the meaning of (a) internet service provider (b) modem. State why a modem is required when connecting to the internet. - What are protocols? Distinguish between transmission control protocol and internet protocol. - What 2 devices are used to connect your computer to the ISP? Name 3 services offered by an ISP. State 6 considerations when choosing an ISP. Give 5 companies providing ISP services in Kenya. - Briefly explain the following types of Internet connection (a) Dial-up connection (b) Direct connection. What unit is used to measure connectivity speed on the Internet? - State the professional title of the employee whose responsibility is to put company advertisements on the internet. Give 2 examples of software used by this employee to carry out the above task. - What do the following abbreviations stand for (i) ISDN (ii) ISP (iii) DARPA (iv) DCA (v) ARPA (vi) ARPANET (vii) TCP/IP (viii) HTTP (ix) FTP (x) WWW.
Internet services	- State and explain any 6 uses of the Internet. - Describe 3 communication services provided by the Internet. Mention 2 education services that benefit from using the Internet, and state how they benefit. - What is meant by e-learning? List 3 problems that a school is likely to encounter as it attempts to set-up an e-learning system. Identify 3 advantages of e-learning. - Outline 3 ways in which the Internet can help you find a suitable job. - State 3 services that can be provided by the Internet through the mobile telephone. - State one advantage of being able to use Internet and cell phone to (a) access your bank account (b) send out Short Message Service (SMS).
Internet terminologies	- Differentiate between internet and World Wide Web. Explain the concept of the Web page. Describe the term 'home page' as applied in the internet. - Define the following web related terms (a) e-commerce (b) sign in/log on (c) browse/surfing the web (d) hypertext document (e) inbox (f) downloading. - Differentiate between a host computer and a web server. - What is a website? Give 2 advantages and 2 disadvantages of a website. - What is web browser? Name 2 examples of software used in Internet browsing. - Write the following abbreviations in full (a) HTML (b) URL (c) WAP.
Accessing Internet	- State the necessary steps required to connect the computers to the internet. - State the use of the following details when logging on to the Internet (a) User ID (b) password. - Name 2 important displays on the Status bar of a browser. - Identify 3 ways you can use to navigate through the internet. - What is a search engine? Name 4 examples of search engines. - Distinguish between HTML and a hyperlink. List 2 advantages of using hyperlinks when browsing the internet. - Explain the 'History' feature with reference to a web browser. - List down 3 benefits of saving information from the Internet to your hard disk. - What is file download? Explain the procedure of downloading a file from the Internet. Name 3 precautions to take when downloading software from the Internet. - Briefly describe 4 advantages of using Internet to disseminate information. Describe briefly 4 problems of using of the Internet.

Electronic Mail (E-Mail) / Use of Internet to access information on emerging issues	• What is e-mail? State the use of e-mail software. Name 3 commonly used e-mail software. Write down 6 features of electronic mail. • Name 3 types of files that you can send via e-mail. • Name and explain the underlined parts of the e-mail address given: *ggitau*@*moest*.*edu*.*ke* • State the purpose of the Uniform Resource Locator (URL) in the Internet. Explain the following internet address *http://www.yahoo.com* in reference to the structure of a URL. Identify institutions whose e-mail addresses end with the following extensions (i) .org (ii) .gov (iii) .edu (iv) .com (v) .net (vi) .mil • Give 5 differences between e-mail and the Post office mail. Explain 5 advantages and 3 disadvantages of using e-mail over the use of the postal address system. List 4 facilities/services of an e-mail.
	• Give 2 reasons why one would create and send an e-mail message. Explain why it is good practice to compose mail offline. Explain how one can check a mail from the internet. • Where does the e-mail program place messages that have been (a) Composed but not sent (b) Received (c) Deleted (d) Sent. • Name 3 actions you may want to take after receiving a message. Give one reason for deleting files from the mailbox. • State one advantage of using the Address Book when working with e-mails. • What is file attachment in relation to e-mail? Explain how you can attach a file to an e-mail document. • What is a spam mail? State 3 undesirable effects caused by spam mail. • State 4 advantages and 3 disadvantages of using the Internet to search for information. • Briefly describe 4 factors hindering Internet growth and access in Kenya.

6. DATA SECURITY AND CONTROL

SUB-TOPICS	CONTENT
Definition of terms / Security threats and control measures	• Define the terms (i) data security (ii) information privacy (iii) data control. Differentiate between personal data and confidential data. • Give the 3 types of data that should be protected in a computer. • Why is information called a resource? How do computers reduce a person's privacy? • Name 3 examples of personal information that can be legitimately gathered about a person by an insurance company. • State 2 rights of a person about whom data is kept. • Write down any 4 threats to data and information. • Define a computer virus. Explain 5 types of computer viruses. Suggest 2 reasons why people may write virus programs. List 5 types of risks that computer viruses pose. Describe 6 ways in which viruses may enter a computer system. Outline 8 symptoms of virus infection in the computer. List down 5 ways through which computer viruses may be controlled. Explain how each of the 5 ways stated assist in controlling viruses. List 4 functions of antivirus software.

	• Outline 6 forms of unauthorized access. Give 6 control measures taken to avoid unauthorized access to data and information. • Explain the meaning of (i) electronic eavesdropping (ii) surveillance (iii) industrial espionage. • What is a computer error? Name 2 types of accidental computer errors by users that may affect computer results. Name 4 ways of controlling the threat of user's errors to data and information. • What is a program bug? • Identify 4 control measures against theft of information, hardware or software. • What is data backup? Using an example, state why it is important to store backups separately from the original data.
Computer Crimes	• Define the term computer crime. State 10 different types of computer crimes. • Define the following types of computer crimes (i) Trespass (ii) Tracking (iii) Tapping (iv) Cracking (v) Fraud (vi) Sabotage (vii) Time bomb (viii) Trap door (ix) Logic bomb. • Define (a) computer hacking (b) computer hacker. Identify 6 motives for hacking. Briefly describe 4 ways in which computer systems can be protected against hacking.
	• What is a program patch? Why are patches important? • What is piracy? State 4 ways in which piracy can be minimized. Name 2 sources of unlicensed software. • Give 2 reasons that may lead to computer fraud. Identify 4 security measures put in place to prevent fraud. • Briefly describe phantom withdrawals in regard to electronic fraud. State 2 ways in which the risk of phantom withdrawals can be reduced. • What is data alteration? Give 3 ways in which alteration of data may take place. Explain 2 effects of alteration on data. Outline 2 security measures to prevent alteration. • Define data stealing.
Detection and protection against computer crimes / Laws governing protection of information systems / Computer security	• Describe 4 ways of protecting information systems against computer crime. • Describe the following terms with reference to security of data (i) physical security (ii) log files. • Give 4 physical precautions that can be taken to secure data. State 2 disadvantages of using passwords. • State a precaution you need to take in order to avoid each of the following when dealing with computer passwords (i) forgetting the password (ii) hacking. • What is an audit trail? Identify 4 benefits of using audit trails. How can an audit trail be used to (a) recover from unauthorized changes in data after a breach of the system (b) detect a trespass.
	• Define (i) data encryption (ii) encryption key (iii) decryption. State 2 ways in which data encryption help to promote data privacy. • What is a computer firewall? Explain the 2 types of computer firewall. Write down 2 functions of a firewall that help to protect the computer system. Who normally configures and controls the firewall in a large organization? • State 4 reasons why it is difficult to detect and prevent computer crimes. • Give 5 provisions provided by the laws governing protection of data and information. • What is computer security? Mention 5 threats to computer security. • Discuss 8 environmental problems affecting the operation of computers.
	•

ROADMAP TO K.C.S.E: FORM 4 COMPUTER STUDIES REVISION GUIDE (PAPER 1)

7. NETWORKING AND DATA COMMUNICATION

SUB-TOPICS	CONTENT
Definition of terms / Data communication	• Define the following terms (a) computer networking (b) computer network (d) server (c) client (workstation). • List 4 network systems that are not computer-based. • State the purpose of (i) file server software (ii) communication software. • Define data communication. Explain 3 modes of data communication, and give examples. Distinguish asynchronous and synchronous data transmission. Give 5 factors considered when selecting data transmission system.

	• Define data signal. Using suitable diagrams, explain digital and analogue signals. • Explain the following terms (a) signal modulation (b) signal demodulation (c) multiplexing (d) demultiplexing (e) frequency (f) baud (g) baud rate (h) band (i) bandwidth (j) guard band (k) baseband signal (l) broadband transmission. • What is attenuation? How can attenuation be rectified? • What is the relationship between bit rate and bandwidth? • What is the work of a multiplexer in networking? • Differentiate between (a) modem and a multiplexer (b) a baseband and broadband signal (c) a network server and a workstation (d) remote client and remote host (e) simplex and duplex data transmission. • Write in full the following acronyms as relates to multiplexing: (a) FDM (b) TDM (c) STDM. • A student typed an e-mail to send over the internet through a modem working at a speed of 100 Mbps. Calculate the maximum number of characters that can be sent per second if each character consists of 8 bits.
Types of computer networks / Purpose and limitations of networking	• Examine 5 major characteristics of each of the following types of networks (i) local area network (LAN) (ii) metropolitan area network (MAN) (iii) wide area network (WAN). Give 3 advantages and 3 disadvantages of each type of network. • List 6 differences between LAN and WAN. • State any 4 hardware requirements you will require to setup a local area network (LAN). • Briefly explain 4 benefits of using LAN at an institution such as a college. • Highlight 6 advantages and 6 disadvantages of networking computers. • Explain how information can be exchanged between standalone computers. • What is a resource? Give 5 examples of network resources. • Briefly explain (a) remote communication (b) distributed processing. State 4 advantages and 4 disadvantages of distributed processing.
Transmission media (data communication media)	• State and briefly describe 3 network elements in a LAN giving an example in each. • Define data transmission media. Distinguish between bounded and unbounded transmission media, and give 2 examples in each. • Mention 4 types of bounded transmission media. • Discuss two-wire open line cables. • Discuss twisted pair cables. Differentiate between unshielded twisted pair (UTP) and shielded twisted pair (STP) cables. Define the term 'pitch' as used in twisted pair cabling. State 3 advantages and 3 disadvantages of twisted pair cables. • Name and explain the parts of a coaxial cable. Explain the importance of the wire braid in coaxial cable. Give 2 differences between thinnet and thicknet coaxial cables. State 3 advantages and 3 disadvantages of coaxial cables.
	• State the function of the following optic fibre cable layers (a) core (b) cladding (b) buffer (d) jacket. • Name the 2 types of fibre-optic cables, and give 3 differences. State 3 characteristics of fibre optic cable. State 4 advantages and 4 disadvantages of fibre-optic cables. • List 3 advantages and 3 disadvantages of wired communication over wireless communication. • Define the term noise. State the type of data communication media that could be used in an electronically noisy environment. Explain your answer. • Describe an electromagnetic spectrum. • Discuss microwave transmission. Differentiate between point-to-point and point-to-multipoint transmission.

	• What is a satellite? Explain the 4 main components in a satellite transmission system. With the aid of a well-labeled diagram, describe the satellite communication technology. Explain the concept of a geostationary satellite. Write down 3 advantages and 3 disadvantages of satellite technology. • Describe the VSAT technology. • Describe radio communication. Identify the main differences between HF, VHF and UHF radio waves. • Distinguish between radio and microwave transmission. • Explain the concept of Bluetooth technology. • Discuss infrared transmission. Identify 2 application areas of infrared transmission. • Explain the line of sight principle in wireless communication. State 4 advantages and 2 disadvantages of wireless communication.
Data communication devices (DCD)	• Define data terminal equipment (DTE). List 4 examples of terminal devices. Distinguish between intelligent and dump terminals. • State 3 importances of front-end processors (FEP) in a network. • Mention 8 examples of data communication devices (DCD). • State the function of (a) network interface card (NIC) (b) modem (c) codec (d) bridge (e) router (f) gateway (g) repeater. • Differentiate between (i) a router and a gateway (ii) a router and a brouter. • Distinguish between a hub and a switch. State the advantage of a switch over a hub.
Network software	• List 2 types of network software. • Outline 5 functions of network operating systems. Give 4 examples of network software. • Outline the seven layers of the OSI reference model in order stating their functions. • Define the term internet protocol. List 4 common examples of protocols used in networking and their purpose. • Write the following in full (a) TCP (b) HTTP (c) IP (d) DTE (e) DCE (f) DCD (g) FEP
Network topologies	• Define network topology. Distinguish between (a) logical and physical network topology (b) Ethernet and token ring topology. • Using well-labeled diagrams, describe (i) star topology (ii) bus topology (iii) ring topology (iv) mesh topology (v) hierarchical (tree) topology. State 4 advantages and 4 disadvantages of each topology. • Suggest with reasons the most appropriate topology required to inter-connect ten stand-alone computers in an institution. • Briefly explain point-to-point and broadcast transmission.

8. APPLICATION AREAS OF ICT

SUB-TOPICS	CONTENT

Financial systems	a. Define an information system.
	b. State 3 areas where computers are used in financial systems.
	c. Identify 2 uses of computers in accounting systems. List 4 benefits of using computers in accounting systems. List down any 4 modules within an accounting package, and state the purpose of each.
	d. Briefly explain how a computerized payroll system works. Name the type of processing that would be required by a payroll system.
	e. List down 10 different ways in which ICT is used in banks.
	f. Explain how an ATM card works. Write down 3 input devices and 4 output devices of an ATM machine. State 5 advantages and 5 disadvantages of using ATM cards. List any 4 types of electronic cards other than ATM card. List 5 ways of taking care of ATM cards.
	g. Give 3 reasons why human resource is still necessary in the banks despite the introduction of the ATM card.
	h. Give 5 advantages of using computers in banking.
Retail systems / Library systems	i. List 4 functions of a stock control system. Identify 3 advantages of computerized stock control systems. Name 3 organizations or businesses that would benefit from computerized stock control systems.
	j. List down 5 different ways in which ICT is used in supermarkets. Differentiate between an EPOS terminal and a cash register. State 4 components of a point-of-sale terminal. Give 3 advantages of using EPOS terminals at a supermarket checkout counter.
	k. Give 2 ways the information on a barcode can be input at the checkout.
	l. Write the following abbreviations in full: (a) EFT (b) ATM (c) PIN (d) MICR (e) EPOS (f) EFTPOS.
	m. List down 5 different ways in which ICT is used in commercial libraries.
	n. Explain how computers are used to do the following in a library (a) lending (b) inventory control (c) cataloguing.
	o. Identify 5 benefits of using a computer in s school library.
Reservation system / Educational systems	p. State 4 application areas where computers can be used for reservation. Name 2 types of processing required by a reservation system.
	q. Describe how computers are used in educational systems to do the following (i) computer-aided learning (CAL) (ii) computer-aided instruction (CAI) (iii) e-learning (iv) computer-based simulation.
	r. Differentiate between computer-aided learning and computer-aided instruction.
	s. Describe how computer-aided instruction can be used to teach small children. List down 3 advantages of e-learning.
Industrial systems	t. Define computer modeling. State 2 dangers of projecting using computer models.
	u. What is simulation? Name any 8 application areas of computer simulation. List down 5 advantages of computer-based simulation.
	v. Define process control. Describe how a computerized process control system works. Name 4 different industries or organizations where computerized process control systems can be found. Give 2 benefits of using computerized process control systems.
	w. What does the abbreviation CAD/CAM stand for? What is meant by CAM? Give 2 examples of CAD software.
	x. Define the term CAD. List 3 application areas of CAD/CAM systems. List 3 advantages of using Computer Aided Design.
	y. What is a robot? Mention 5 areas where robots are used. Mention 3 types of robots. List 5 reasons why an industry may opt to use robots.
	z. What are intelligent (adaptive) robots, and where are they used?

Scientific and Research systems	aa. Explain 2 ways in computers are used in weather forecasting. What type of computers are suited for weather forecasting, and why? bb. Explain 8 ways in computers are used in the medical field. cc. State 2 ways on how ICT can be used to reduce the spread of HIV/AIDS. dd. In what ways have computers contributed to the growth in military science? ee. Explain 4 ways in which computers have enhanced space exploration. Give 4 ways in which astronauts in space and the mission control unit use to communicate.
Expert systems / Communication systems	ff. Write in full, hence explain the term ICT. gg. Give 4 ways in which computers are used in radio broadcasting stations. hh. Mention 2 types of data transmitted via televisions. State 2 main differences between a teletext and a videotext (view data). Identify 4 services provided by teletext and a videotext system. ii. Describe the following network services (i) video messaging (voice mail) (ii) video conferencing. List down 3 hardware and software required to conduct a video conference. Identify 2 ways in which video conferencing communication can be used. Give one benefit to a company that uses video conferencing.
	jj. What is meant by teleworking (telecommuting)? State 5 advantages and 5 disadvantages of working from home. kk. Define the internet. Give 4 different types of information available on the Internet. Discuss 2 services available on the internet. Distinguish between internet and World Wide Web (www). ll. What is e-mail? List 5 advantages of e-mail over conventional mail. mm. State 2 ways that a report could be sent to an office using the Internet. nn. List 4 advantages and 4 limitations of cell phones over fixed lines.
Law enforcement / Entertainment systems / Home use / Transportation systems	oo. List 3 ways in which computer technology can be used in law enforcement. Define the term Biometric analysis. pp. How have computers been used by the music and movie industry? qq. List down 3 ways in which computers are used in homes. rr. Give 2 computer applications in automatic traffic control. What type of computer software is used in the automobile industry? State 2 advantages of automatic traffic control. ss. Briefly describe how computers are used in air traffic control. State 3 advantages of automatic air traffic control. tt. Give any 4 uses of computers in the shipping industry.
Marketing systems / Virtual (artificial) reality	uu. Define the term e-commerce. List down 4 benefits and 3 disadvantages of e-commerce. vv. Explain 5 ways in which ICT can enhance commerce. ww. Explain the meaning of the term 'virtual reality.' List 3 interactive sensory devices used in virtual reality, and state their uses. xx. List 3 application areas where virtual reality is used. yy. Differentiate between simulation and virtual reality.

9. CAREER OPPORTUNITIES IN THE FIELD OF ICT

SUB-TOPICS	CONTENT
Description of career opportunities in the field of ICT	• Who is a Systems analyst? State 5 responsibilities of a systems analyst. Outline 6 qualities of a good systems analyst. • Who is a Data processing manager? State 6 duties of a DPM. • Who is an Information system manger? State 4 responsibilities of an information systems manager.
	• Who is a Computer programmer? Outline 6 duties of a programmer. Identify 4 qualities of a good programmer. • What is the role of the Chief programmer/programming manger? Outline 5 duties of a programmer. • Who is a Database administrator (DBA)? Outline 6 duties of a DBA. • What is the role of a Computer operator? List down 6 duties of a computer operator.
	• Who is a computer hardware engineer? Outline 4 duties of a hardware engineer. • Who is a computer technician? Outline 4 duties of a computer technician. • Who is a software engineer? Outline 4 duties of a software engineer. • Differentiate between a software engineer and a computer engineer.
	• What is the role of a Network administrator? List down 4 duties of a network administrator. • What is the role of a Web administrator? Outline 4 duties of a web administrator. • What is the role of a Web designer? Identify 4 examples of software used to develop websites.
	• Who is an ICT trainer? Outline 4 duties of an ICT trainer. • What is the role of a Librarian? Outline 4 duties of a librarian. • Identify 4 qualities of a good computer sales representative. • List 4 types of job opportunities that are available in the field of computer hardware. • State 4 career opportunities associated with databases.
Educational opportunities in ICT	• Show the difference between public and private universities. Give 5 examples of public universities that offer computer-related courses in Kenya. • Explain the term accreditation as used in education. State 5 examples of accredited private universities that offer computer-related courses in Kenya • Identify 8 ICT related degree programmes offered at the university level. State 5 ICT related masters or PhD programmes offered at the university level.
	• Give 4 examples of polytechnics offer ICT-related courses in Kenya. Identify 6 different awards attainable in polytechnics that offer ICT courses. • State 6 examples of colleges that offer computer science as a subject. • Outline 4 ICT courses offered at college level. • List 5 examinations bodies for higher diploma, diploma and certificates in computer courses. • State 4 factors to consider before joining a college to pursue an ICT course.

10. IMPACT OF ICT ON SOCIETY

SUB-TOPICS	CONTENT
Effects resulting from the use of ICT in our society	• Explain 3 ways in which computer technology may affect employment patterns in organizations. State 2 reasons why the employment patterns are affected. • Distinguish between job replacement and job displacement. • What is automated production? State 4 areas where automation can be applied. List 4 advantages and 4 disadvantages of automated production.
	• Discuss 6 negative effects of computers on human health, and state the methods of reducing such effects. • Define ergonomics. • Explain 3 effects of ICT on environment. • State the bad effect that wrong disposal of nickel-cadmium batteries can have on the environment. • Explain the role of Environmental Protection Agency (EPA). • Identify 2 ways in which ICT has affected our moral and cultural values. • Define the term flaming. • Discuss how the use of ICT has led to increase in computer crimes and abuse.
Future trends in ICT	• Explain the technological evolution of computer hardware and software. • Explain the concept of Information superhighway. • Define the term artificial intelligence (AI). List 4 main application areas of artificial intelligence. • Define an expert system. List 4 importance of expert systems. Explain the 4 components of an expert system. Give 4 examples of expert systems. Identify 4 areas where expert systems may be applied.
	• What is natural language processing? Give a reason why the success of natural language processing is important. • What are artificial neural networks? List down 2 features of an artificial neural network. • Define the term robotics. Explain 5 features of an intelligent robot. • Explain (a) voice recognition (b) voice synthesis (c) computer vision.
	• Suggest how computers may in future be made more user-friendly for persons that are (i) blind (ii) without hands. • Give 4 reasons why a firm may decide to computerize its operations. • Explain the impact of information technology on organizations in each of the following areas (a) competition (b) pace of growth (c) job opportunities (d) job skills (e) communication. • Explain 4 reasons why users may resist the introduction of computers to their place of work. List 3 ways in which this resistance may manifest itself. Suggest 3 strategies that can be employed to manage resistance to change.