**MARKING SCHEME**

**COMPUTER STUDIES PAPER 451/1**

**END TERM 1 2022**

**SECTION A [40 MARKS]**

1. **Outline three distinctions between a super computer and microcomputer. [3 marks]**

|  |  |  |
| --- | --- | --- |
| **S.No** | **Supercomputer** | **Microcomputer** |
| (i) | Large in size | Small in size |
| (ii) | Have huge processing speed | Low processing speed |
| (iii) | Generate a lot of heat | Generate less heat |
| (iv) | Expensive to purchase  | Cheaper to purchase |

1. **State four features of fifth generation computers. [4 marks]**
* Use of expert system
* Support the use of natural language
* Support distributed computing
* Support artificial intelligence and voice recognition
* Support parallel processing
* Small in size/portable

**3. (a). Explain two uses of forms in database design. [2 mark]**

* Enter data into tables
* Display data from tables and queries

**(b). i). Define the term control as used in report and form design. (1 mark)**

* A control is an object such as a textbox, checkbox, command button or shapes that you place on a from design grid to display data or perform actions.
**(ii). Explain briefly the difference between bound and unbound controls.(2marks)**
* A bound control is one whose source of data is a field in a table or a query while unbound control is not connected to any data source.

**4. State any two differences between function keys and special keys of a keyboard. [2 marks]**

**Function keys Special keys**

- Normally used singly to execute tasks -Normally used in combination with other

 keys to execute task.

- Initiate frequently done task to occur - Give special instruction to the computer

**5. In system development, testing is one of the critical stages. Give three reasons why the testing phase is critical to the systems developer. [3 marks]**

* Helps to ensure that the logical ad physical designs and environment are to the users satisfaction
* Help to detect and correct errors
* Gives proof to those skeptical about the working of the system
* Helps to establish how the system works under various conditions.

**6. Write the following abbreviations in full. [3 marks]**

i). **BCD** -Binary Coded Decimal

ii). **ASCII** -American Standard Code For Information Interchanger.

iii). **EBCDIC** -Extended Binary Coded Decimal Interchange Code

**7. State two properties that an operating system display about a file. [1 mark]**

* The date and time the file was created or modified
* The size of the file

**8. Differentiate between Computer Aided Design (CAD) and Computer Aided Manufacture (CAM). [4 marks]**

* CAD refers to an Integrated system that allows products to be designed using design application software whereas CAM are systems that allow products designed using design applications to be transmitted into an automated manufacturing systems for the product to be manufactured as per the computer model.

**9. (a). Distinguish between a primary key and index key as used in databases. [2 marks]**

* A primary key is an index that uniquely identifies each record stored in a table and it prevents the user from making duplicate entries.
* An index is a key used to speed up searching and sorting of records in a table.
* A foreign key is a field in a table that matches the primary field of another table and is used to establish relationships between the tables.

**(b). Explain the relevance of foreign key in a database entity. (1 mark)**

* A foreign key is a field in a table that matches the primary field of another table and is used to establish relationships between the tables.

**10. List three differences between laser printer and a dot matrix printer. [3 marks]**

**Laser printer dot matrix printer**

* High print speed low printing speed
* Can do no multiple jobs can’t do multiple jobs
* quiet printing noisy printing
* Uses photocopier techniques characters formed by combination of dots
* High print quality low print quality

**11. Name an input or output device used in the following tasks. (2 mark)**

**a). Capturing still images**

* Digital camera

**(b). Printing detailed architectural designs**

* plotter

**(c). Playing flight and driving games**

* Joy stick

**(d). Capture data at ATM**

* Touch screen/keypad

**12. What is the use of the search and replace feature in a word-processor. (1 mark)**

* To locate a particular word or character or text
* To locate and replace the occurrence of a particular words text or character with another

**13. State two ways in which a computer may be used in efficient running of a hospital. (2 marks)**

* Storing patients records
* Monitoring patients e.g. babies in incubators, ICUs etc.
* Diagnosis, data from sensors attached to the patient can be fed into a computer e.g. in heart ailments CAT and MRI scans
* Medical training e.g. using simulations software to show how a body part works

**14. The formula = $A4\*C&3 was entered in cell D4. What will be the formula if it is copied to cell F10. [1 mark]**

* = $A10\*C & 3

**15. Name any three methods that can be used to test a program of errors. (3 marks)**

1. Desk checking (Dry-run)
2. Using debugging utilities
3. Using test data

**SECTION B [60 MARKS)**

***Answer question 16 and any other three questions from this section.***

**16.[a]. Design a flowchart for a simple program that can be used to categorize people according to age. If the person is above or equal 118 years, output “Adult” otherwise output “Young”. (8 marks)**

Correct symbols (3 marks)

Correct us of arrows (1 mark)

Correct labelling (4 marks)

Age

 YES

 NO

Age2=18?

Young

Adult

**(b).What is the difference between looping and selection? (2 marks)**

* Looping executes the same block of code (module) again and again until a certain condition is fulfilled, while in selection, execution of a statement(s) depends on a condition that returns true or false (yes/No)

**[c]. Name the stage of program development cycle when: [2 marks]**

**(i). A user guide would be written**

* Documentation

**(ii). A programmer dry-turn the code**

* Testing and Debugging

**(iii). System charts would be drawn**

* Program Design

**(iv). Staff training is done**

* Implementation

**(d). State the three translators used in programming. (3 marks)**

(i). Assemblers

(ii). Compilers

(iii). Interpreters

**17.(a). Define the term data communication. (1 mark)**

* Refers to the process of transmitting data signal from one point to another through the network

**(b). Explain the following terms as used in data communication. (2 marks)**

**(i). Bandwidth**

* This is the maximum amount of data that a transmission medium can carry at any one time

**(ii). Attenuation**

* This is the decrease in magnitude and energy as a signal progressively moves along a transmission medium

**(c). Explain the following three types of computer networks. (3 marks)**

**i). LAN**

* This is a computer network that spans a relatively small geographic area like one building or a school

**ii). MAN**

* A network that covers a medium-size geographical area like a town or city

**iii). WAN**

* A network that covers unlimited geographical area

**(d).i). What are robots? (1 marks)**

* These are computer controlled devices usually in form of mechanical and are used to manipulate objects

**(ii). Outline any four advantages of using robots in industries over human beings. (2 marks)**

* They do not make mistakes
* They work under hazardous conditions
* Are quite efficient
* Work tirelessly for long hours

**(e). Describe the following communication modes giving an example in each case. (6 marks)**

**(i). Simplex**

* A transmission mode which allows transmission of data in only on direction. An example is the normal radio or television broadcast.

**(ii). Half duplex**

* A transmission mode which allows transmission of data in two directions, but only one direction at a time e.g. the police radio calls.

**(iii). Full duplex**

* A transmission mode which allows transmission of data in two directions concurrently e.g. telephone transmission.

**18. [a].List two characteristics of good information. [2 marks]**

* Relevant to its purposes
* From reliable source
* Correct, accurate and complete
* Communicated to the right person and at the correct time.

**(b(i). What is a database management system? [1 mark]**

* A program that manages the storage, manipulation and access data from the database

**(ii). State and explain three database models. (3 marks)**

* **Network** - data is represented as a collection of records and relationships joined by links
* **Relational**- data is held as a collection of tables.
* **File**-data items are stored sequentially in one large file

**c). Describe the following types of files.**

**(i). Master file (2 marks)**

* A file that holds permanent data in an organization against which transaction are processed.

**(ii). Backup file (2 marks)**

* A file created from existing master file to store duplicate copies that can be used to store the original file in the event of loss or damage

**(iii). Transaction file (2 marks)**

* A file that holds temporary incoming and outgoing data in an organization for a given period of time.

**d). Explain the file organization methods given below.**

**(i). Serial (1 mark)**

* Records are written onto the disk in the order in which they come with no regard for sequence.

**(ii). Indexed sequential (1 mark)**

* Records are arranged on disk in sequence with an index added for easier access.

**(iii). Random (1 mark)**

* Records are arranged on disk randomly with no obvious relationships among them.

**19. (a). A shopkeeper of a small shop at Longisa has bought desktop computer to assist him in performing his business activities. He has been advised that before he can use it to work he has to install it with an operating system. State any six factors to consider when choosing the operating system. [6 marks]**

* Hardware configurations
* Basic design of the computer
* Applications intended for the computer
* User friendliness
* Availability in the market
* Cost
* Reliability

**b). With reference to disk management explain what is meant by the terms below.**

**i). Formatting (1 mark)**

* Preparing disks for data storage by creating sectors and track on the disk surface

**ii). Defragmentation (1 mark)**

* The rearrangement of scattered files on a storage media in order to speed up access to files.

**iii). Disk partitioning (1 mark)**

* The process of dividing a large physical disk into two or more portions/logical drives or volumes

**c). Give any two reasons that may make the shopkeeper to partition the computer disk. [2 marks]**

* In order to install more than one operating system on the same disk.
* In order to be able to make back up on the same disk
* For security purposes, in case one partition fails the second partition remains functional.

**(d). The shopkeeper one day switched on the computer and experienced a number of problems with windows operating system that he had installed. The problems included failure to load the operating system during the booting. After several trials of switching on the computer, it hangs so often alongside abnormal restarting. State any four possible causes for the computer’s behaviour. (4 marks)**

* Hardware conflict or incompatibility possibility due to interrupt requests or missing device drivers
* Possibility of a problem in the installation process
* Problem with hard disk boot sector due to damage or virus attack
* Insufficient memory
* Corrupted system windows registry

**20. (a) Describe the octal number system. (2 marks)**

* Each symbol is represented by 3 bits
* The number is made up of 8 symbols
* 0,1,2-----7
* Maximum value of a single digit is 7
* The number system uses base 8

 **(b). Convert each of the following to the number system indicated:**

**i). 111.1012 to decimal; (3 marks)**

* 111=1x22+1x21+1x20=4+2+1 = 710

0.101 = 1x2-1+1x2-2+1x2-3

= 0.5+0.25+0.125

= 0.62510

⁖111.1012 = 7.62510

 **(ii). 14.687510 to binary [4 marks]**

* 14 = 11102

 0.6875x2 = 1.375

0.375x2 = 0.75

 0.75x2 = 1.50

 0.50x2 = 1.00

Decimal portion

0.10112

1110.10112

**(c). Convert the number -1710 into 8-bit:**

**(i). signed magnitude representation; (2 marks)**

* 1710 = 10001 or 100012

Signed magnitude representation 10010001

**(ii). two’s complement (2 marks)**

* 1710 = 10001

In 8 bit 00010001

Reverse bits

11101110

 +1

11101111

= 111011112

**(d). Perform the arithmetic operation. (2 marks)**

 **110.112 + 11.0112**

110.110

011.011

1010.001

1010.0012