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الموقع التعليمي لجميع المراحل الدراسية

في المملكة العربية السعودية

Prince Sattam bin Abdulaziz University
Preparatory Year Deanship

Fundamentals of

Computer Programming and Problem Solving

[Information Technology]

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Fundamentals of Computer Programming and Problem Solving

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Introduction:

To solve any programming problem use the following:

1. Algorithms
2. Flowcharts
3. Pseudo code

1. ALGORITHM

A sequence of steps to be performed in order to solve a problem by the computer

Example 1.1

Algorithm for addition of two numbers

Step1: Start

Step 2: Input A, B

Step 3: Calculate C=A+B

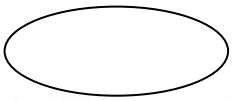
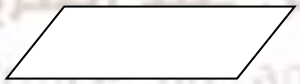
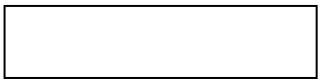
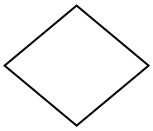
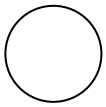
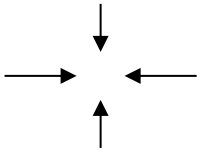
Step 4: Output C

Step 5: Stop

2. FLOW CHART

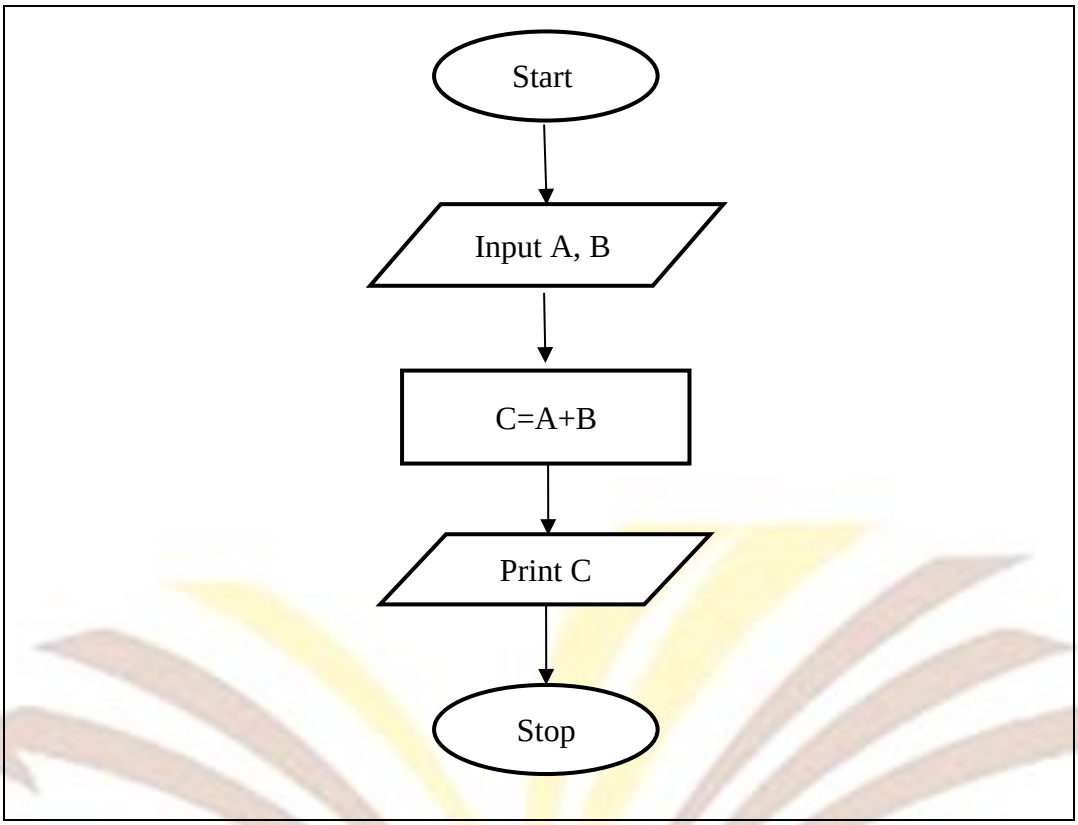
The symbolic representation of an algorithm is called a flow chart.

Symbols used in a flow chart:

Symbol	Name	Functions
	Oval	Start/Stop
	Parallelogram	Input/output
	Rectangle	Processing
	Diamond	Decision Making
	Circle	Connector
	Flow lines	Control Flow

Example 2.1

Flow chart for addition of two numbers



Example 2.2

Algorithm and flow chart for the average of two numbers

a. ALGORITHM:

Step1: Start

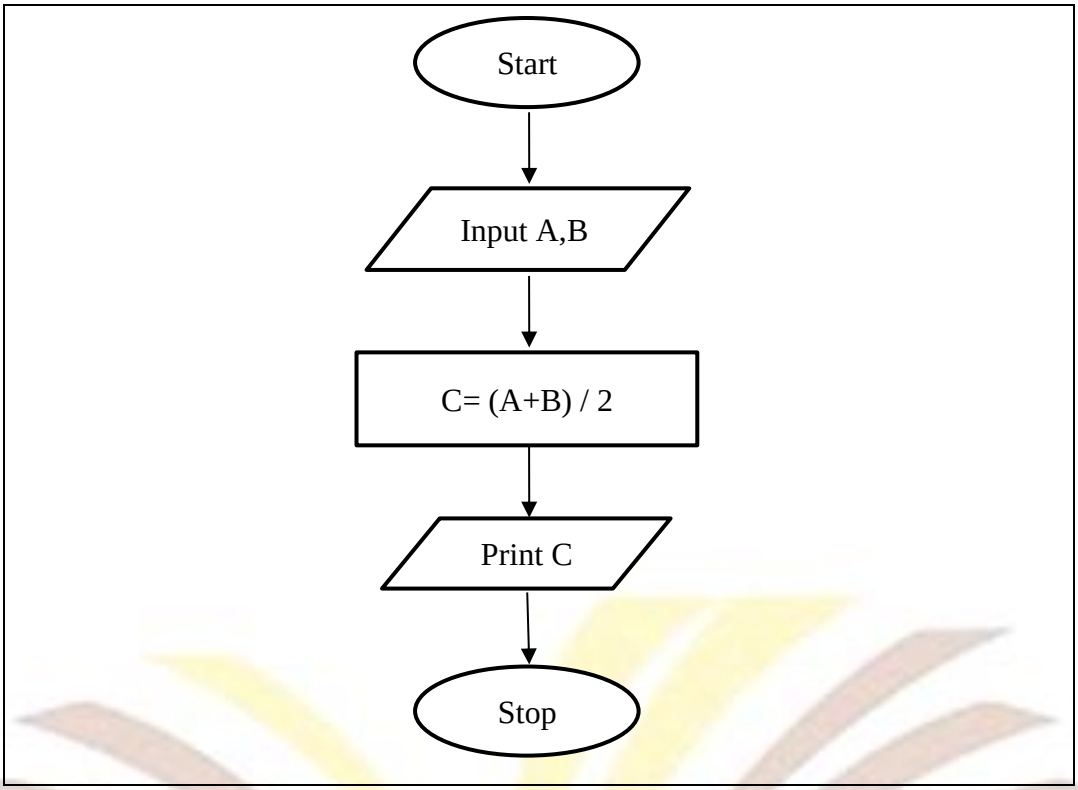
Step2: Input A, B

Step3: Calculate C= (A+B) / 2

Step4: Output C

Step5: Stop

b. FLOW CHART:



3. CONTROL STRUCTURES

A control structure is a block of programming that analyzes variables and chooses a direction in which to go based on given parameters.

It has two type

1. **Branching** (Branching is a decision - what actions to take.)
2. **Looping** (Looping is a decision - how many times to take a certain action.)

3.1 Example of Branching:

Algorithm and flow chart for greatest of two numbers.

a. ALGORITHM:

Step1: Start

Step 2: Input A, B

Step 3: IF A > B

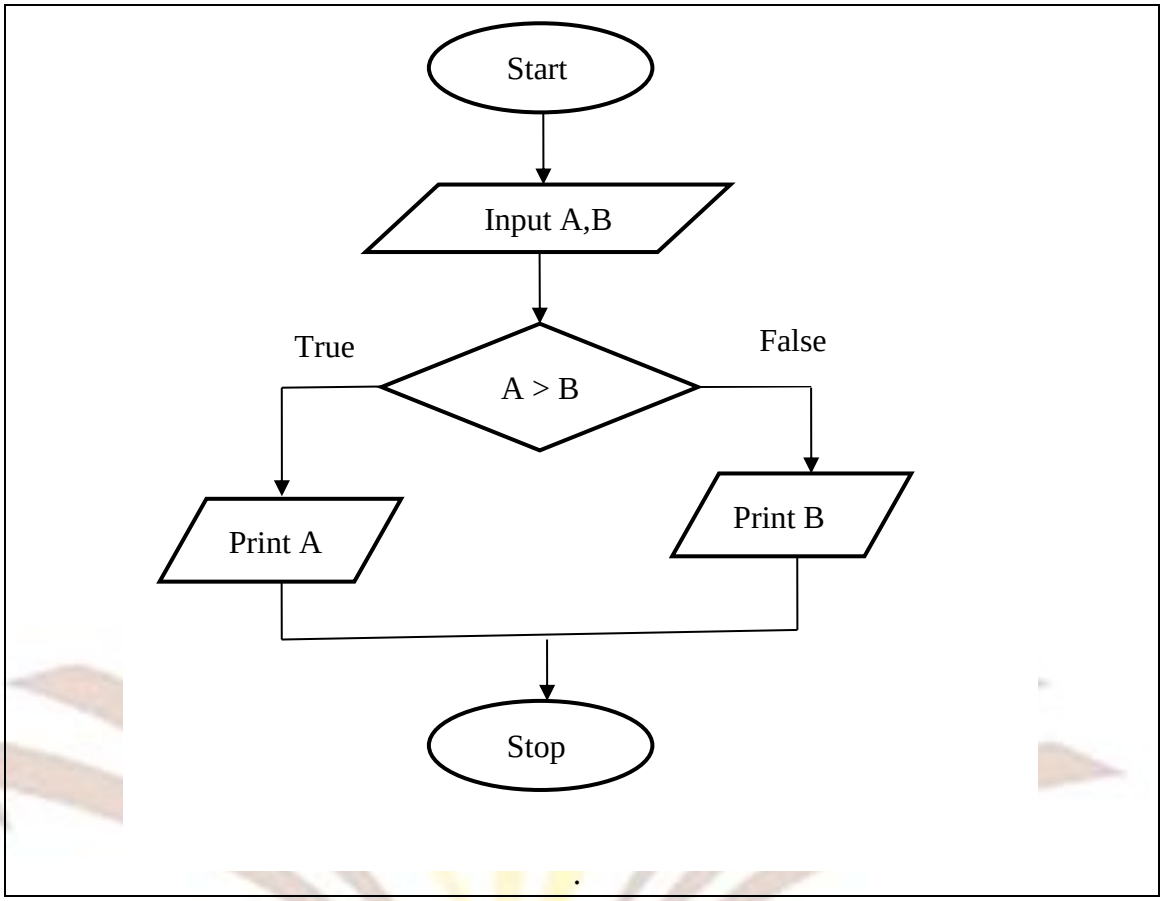
Step 4: Output A

Step 5: else

Step 6: Output B

Step 7: Stop

b. FLOW CHART:



3.2 Example of Looping:

Algorithm and flow chart for **display of first 5 natural numbers** using control structure while.

a. ALGORITHM:

Step 1: Start

Step 2: Set i= 0

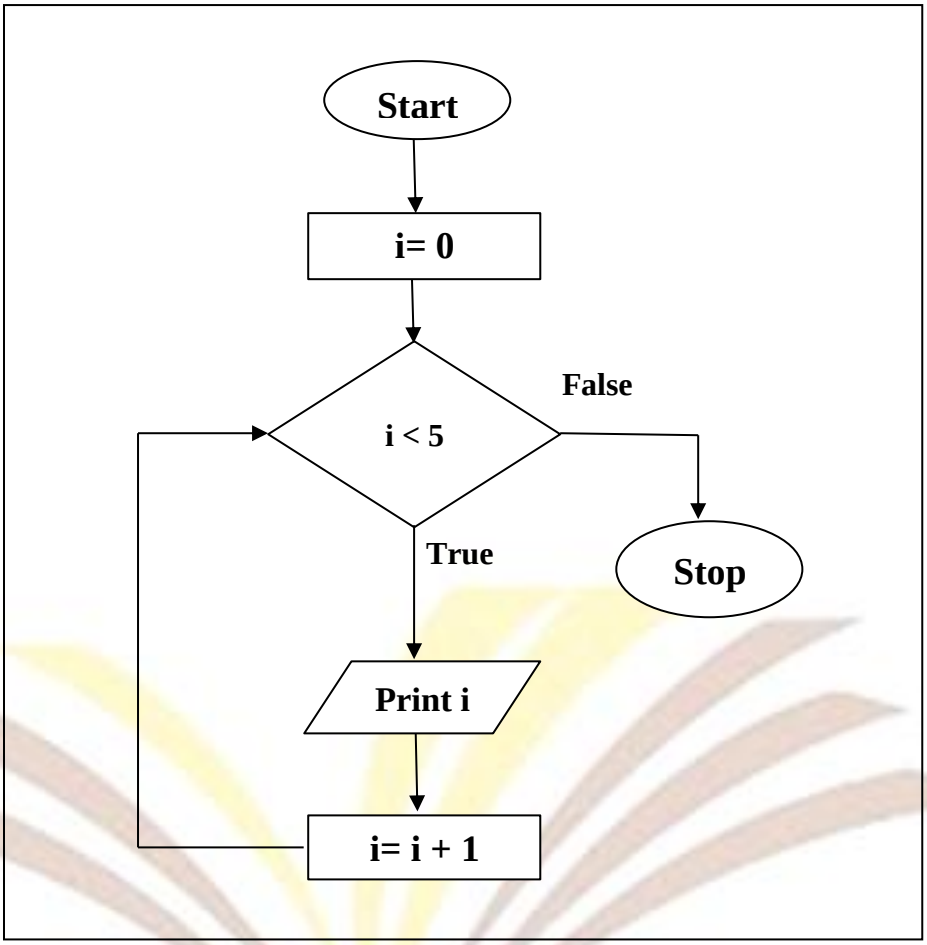
Step 3: While i is less than 5

Step 4: Output i

Step 5: Increment i // i=i+1

Step 6: Stop

b. FLOW CHART:



4. PSEUDO CODE

Pseudo code is an artificial and informal language that helps programmers develop algorithms. Pseudo code is a "text-based" detail (algorithmic) design tool.

The rules of Pseudo code are reasonably straight forward. All statements showing "dependency" are to be indented. These include while, do, for, if, switch. Examples below will illustrate this notion.

Example 4.1

a. PSEUDO CODE:

```
If fever is more than 37 degrees Celsius
Then
    Print “a person with fever"
Else
    Print “a person without fever"
```

b. **ALGORITHM:**

Step 1: Start

Step 2: Input F Values

Step 3: If F > 37^{o}c

Step 4: Output “a Person with Fever”

Step 5: Else

Step 6: Output “a Person without Fever”

Step 7: Stop

Example 4.2

a. PSEUDO CODE :

If student's grade is greater than or equal to 60

Then

Print "Pass"

Else

Print "Fail"

b. ALGORITHM:

Step 1: Start

Step 2: Input grade Value

Step 3: If grade ≥ 60

Step 4: Output “Pass”

Step 5: Else

Step 6: Output “Fail"

Step 7: Stop

5. DATABASE AND DATABASE MANAGEMENT SYSTEM

5.1 Database: A database is any collection of related data.

Example: Student database

No	Student ID	Student Name	Mid Term(60)	Final(40)	Total(100)	Grade
1	434050285	MISHAL AYED S ALABDOH	60	39	99	A+
2	434050538	FAISAL ABDULLAH H ALMASHARI	60	34	94	A
3	434050637	RAIED MOHAMMED HAMAD AL WADANI	50	35	85	B
4	434051095	MUHANNAD ABDULLAH N ALOTAIBI	60	0	60	D
5	435050133	ALI HAMOUD ALI ALHABH ALSHAMRANI	53	0	53	F

5.2 Database Management System:

A database management system is a software designed to help in maintaining and utilizing large collection of data.

6. PROGRAMMING LANGUAGE

A programming language is a formal constructed language designed to communicate instructions to a machine, particularly a computer.

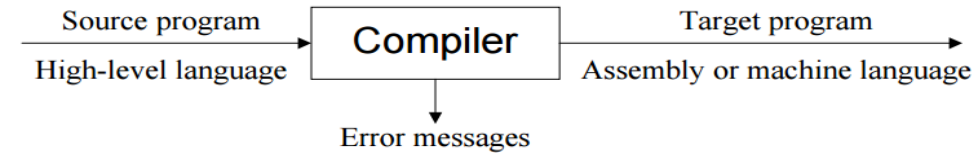
Examples of programming languages: **C, C++, JAVA, COBAL, FORTRAN, etc.**

Use	Language
Business Application	COBOL(Common Business Oriented Language)
Scientific applications	FORTRAN (FORmula TRANslation)
General purpose use and education	C, C++, JAVA, Pascal, Visual BASIC.

7. COMPILER AND INTERPRETER

7.1 Compiler:

Compiler is a program that translates a high level language into machine level language.



7.2 Interpreter:

Interpreter is a program that translates a high level language into machine level language line by line.

7.3 Comparison between Compiler and interpreter

#	Compiler	Interpreter
1	Compiler Takes Entire program as input	Interpreter Takes Single instruction as input.
2	Program execution is fast	Program execution is relatively slow
3	Example : C Compiler	Example : BASIC

1- Is program which consists of step by step instructions?

A- Hardware

B- Software

2- Reduce the gap speed between RAM and the CPU

A – Cache

3- Processing of taking all the broken pieces of files and joining them back together again is called ?

A - Defragmenting files

4- Which of the following is a type of a real time communication service that both parties are online at the same time?

A – E-MAIL

B – WEP LOG

C- Instant message

D – Non of the above

5- Are used to store programs and large data files permanently. They are also very fast and their capacity is measured in Gigabyte or Terabyte.

A. DVD

B. Floppy Disk

C. RAM

D. Hard disks

6- What is the function that related to operating system

A- Photo editing

B-File management

C- Internet browsing

7- Which language of the following programming is used with business application

A- FORTRAN

B- COBOL

C- Java

D- C+

8 - A……is a specific computer which saves all common files

A – Client

B- Server

9- MMS means:

A – Multimedia Message Serves

10 - SMS means :

A – Short Message Serves

11 - Telephone use.....for send and receive:

A - Analogue Signals

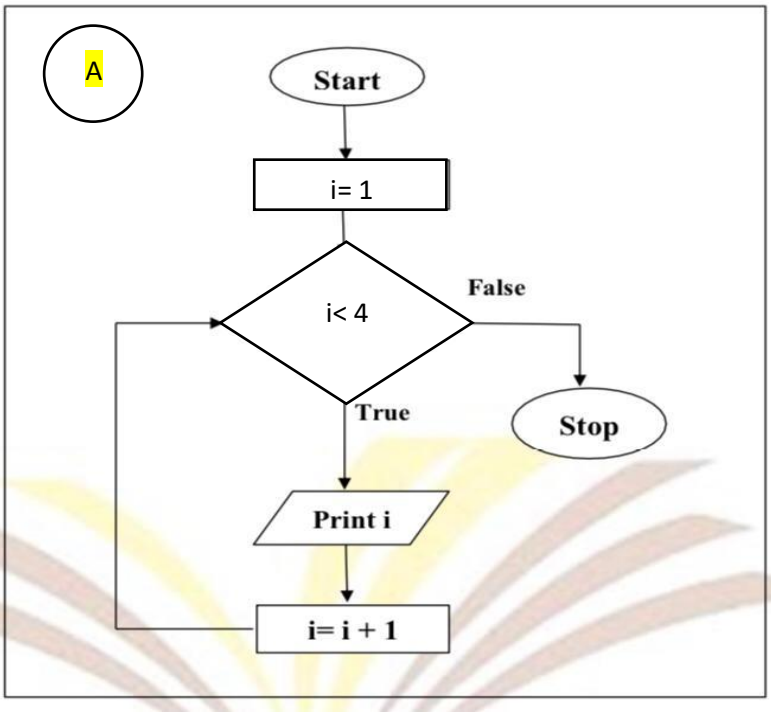
12 - The processing spead of a processor is represented by its……spead

A –Clock

13 -Decimal number 9, Binary will be?

A – 1001

14 - Which of the following will give 1,2,3 as a result :



15 - Is an example on operating system :

A – MS- DOS

16 - Computer uses…….. which is a tiny electrically operated switch that can alternate between on and off millions of times per second .

A – Transformer

B – Transistor

17 -Used to organize large amounts of information

A- Database

B- Ms-word

C- Spreadsheet

D- photo editing

##Answer the following as True or False :

18- Parallel slower than serial port?

True

False

19– Extranet is a private network that share a part of a business information?

True

False

20– The mine reason of E-LERANING is that "one trainer can train many people in different locations ?

True

False

21 - Circle symbol is used for Control Flow ?

True

False

22- Discrete speech system is naturally ?

True

False

23 - Parallel faster than serial port?

True

False

24 - Internet is a private network that use to business information?

True

False

Match the following from “List A” with “List B”

A	B
25 -is a socket on the outside of the system ..... unit (D)	A - interpreter
26 - it is not lost when it is turned off (C)	B - Time bomb
27 - translates from high level language into . machine level language line by line (A)	C - ROM
28 -Is the way to deal with computer. (E)	D - Port
29 -Starts in a specific time (B)	E -Interface

قام بهذا العمل مجموعه من الطلاب من الدفعة 41 فان إن أحسنا فمن الله، وإن أسأنا أو أخطأنا فمن انفسنا والشيطان

بالتوفيق للجميع

Preparatory Year Deanship

Course: Computer Skills

Course Code : CT140/1400

Points: 20 points

Credit: 20%

Sample website questions

Note: This test booklet contains 5 Pages.

Part "A" Consist of 10 Questions and each Question carry one Mark

Questions (1-10)

Fill up the blanks from the following options -

a. **Defragmenting files**	b. **1010**	**c. Network**	d. **Intranet**	e. **control structures**

1. We convert decimal number 10(Ten) in a Binary system we get **…… (b)……** result
2. Processing of taking all the broken pieces of files and joining them back together again is called**……(a)……**
3. A**……..(e).....** is a block of programming that analyzes variables and chooses a direction in which to go based on given parameters.
4. **……(d)……** is a private network that is contained within an enterprise.
5. A**……(c)……** is a group of computers connected to each other to share resources.

Match the following from "List A" with "List B" –

List A	List B
6. In which year IBM produced its first personal computer (d)	a. Buses b. Input/output c. Start/Stop d. 1981 e. Windows
7. Oval shape is used for (c)	
8. Collection of wires which Transmits Data (a)	
9. Parallelogram symbol is used for (b)	
10. Example of operating system(e)	

Part "B" Consist of 20 Questions and each Question carry Half Mark (0.5)

Questions (11-30)

Answer the following as True or False -

11. If there is any error in source program then also compiler will change source program to target program. (True/ **False**)
12. Projector is an example of both input and output device (True/**False**)
13. The term software refer to the physical components of computer(True/ **False**)
14. Speed of CPU is measured by Mega Byte or Giga Byte (True/ **False**)
15. Input devices allow you to input information or data to the computer. (**True**/False)

Multiple choice questions –

16. When the computer is shut off the content of _____ is erased.

    a. **Random Access Memory.**
    b. Storing Memory.
    c. Virtual Memory.
    d. Read Only Memory.

17. _____are used to store programs and large data files permanently. They are also very fast and their capacity is measured in Gigabyte or Terabyte.

a. DVD
b. Floppy Disk
c. RAM
d. Hard disks

18. A laptop is most likely to have which one of the following input devices fitted as standard.

a. Scanner.
b. Joystick
c. Mouse
d. Touchpad

19. Binary number 1001, in decimal will be.

a. 10
b. 5
c. 4
d. 9

20. Collection of 8 bits is called_____.

a. Bits only
b. Gigabyte
c. Terabyte
d. Byte

21. Which of the following is system software?

a. A Spreadsheet
b. A Database
c. An operating system
d. A Hard Disk

22. The transfer rate is the volume of data that can be travelled via transmission media in

a. One hour
b. One minute
c. One second
d. All of the above

23. Which one of the following statements is true?

a. A gigabyte is less than a megabyte.
b. A kilobyte is greater than a megabyte.
c. A byte is less than a bit.
d. A terabyte is greater than a gigabyte.

24. Compiler takes _____ as input?

a. Single instruction
b. Entire program
c. Line by line
d. None

25. What is the value of I variable after the while loop statement below is finished?

Start

Read i=0

While i < 5

Output i

i=i+1

Stop

a. 0,1,2,3,4
a. 1,2,3,4,5
b. 0,2,4,6
c. None of the above

26. Which one is below application software

b. MS Excel
c. MS DOS
d. Mac OS
e. OS/2

27. The keyboard, mouse, monitor, and system unit are:

a. Hardware
b. output devices
c. storage devices
d. software

28. Programs that coordinate computer resources, provide an interface, and run applications are known as:

a. application programs
b. operating systems
c. storage systems
d. utility programs

29. RAM is a type of:

a. Computer
b. Memory
c. Network
d. Secondary storage

30. The largest network in the world is:

a. Twitter
b. Internet
c. Web
d. USB