

**451/ 1**  
**COMPUTER (THEORY)**  
**PAPER1**

**SECTION A**

**40MKS\*UG\***

1. For count – 1 to 10 Do  
PRINT “ Enter a Number (N)’  
INPUT N  
Sum = Sum + N  
END FOR  
Display sum

2mks\*UG\*

2. Optical  
These types of scanners capture data using light  
A special type of concentrated beam of light is passed over the object, image or text which need to be entered inside the computer. The scanner converts it into digital form example  
Optical mark recognition (OMR)  
Optical bar recognition (OBR)  
Optical character recognition (OCR)

(1mk) \*UG\*

Magnetic scanner  
Capture data by using magnetic technology  
i.e. magnetic ink character recognition (MICR)  
Magnetic strip recognition

(1mk) \*UG\*

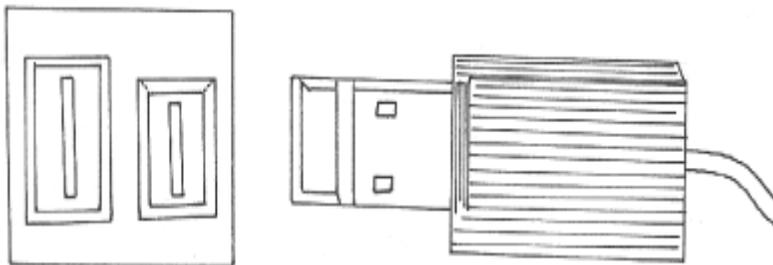
3. Command line interface  
Menu driven interface  
Graphical user interface

½ mk each\*UG\*

4. A folder is a named storage area where the user can store related files to enable easy access  
½ mk\*UG\*  
Sub folder – this is whereby a large folder is divided into smaller units called subfolders  
Subfolder is within another folder

½ mk\*UG\*

5.



USB port and its interface

USB is set to replace the convectional parallel and serial cables and port  
It provides very high speed and quality data transmission over distance by approximately 5 meters  
2mks\*UG\*

6. Parallel cables transmit information simultaneously using a set of many conductors (wires) ½ mk \*UG\*  
 Serial cables transmit one bit at a time ½ mk \*UG\*
7. Zip disks  
 They are high capacity disks that resemble the floppy disks. They are slightly larger and thicker in size .It can hold as much as 250MB ½ mk \*UG\*  
 Jaz disks  
 They are small portable disks with high storage capacity of about 1 GB to 2Gb.They are used to store data that require large storage
- b. Lc- 120 super disk (SD)  
 Digital versatile disk (DVDs)  
 Optical card  
 Optical tape ½ mk each\*UG\*
8. i) Industrial espionage – Spying on your competitor to get information that you can use to counter or finish competitor. The aim is to get ideas on how to counter by developing similar approach or sabotage. ½ mk \*UG\*  
 ii) Eavesdropping  
 -Tapping into communication channels to get information ½ mk \*UG\*  
 iii) Surveillance  
 This is keeping of a profile of all computer activities done by another person ½ mk \*UG\*
9. (i) Surf / browse- It is the process of accessing internet resource like the web page and website  
 i) Hyperlink  
 It is a text on picture on an electronic document especially webpage that cause other web pages to open when the link is clicked ½ mk \*UG\*
- b) i) It regulates power from a unstable power source to the required stable voltage by eliminating surges and blow outs ½ mk \*UG\*  
 ii) It temporarily provides power to the computer in case of sudden power failure ½ mk \*UG\*
10. i) Manual  
 ii) Mechanical  
 iii) Electronic ½ mk \*UG\*
- b) Internet is a large network of networks that covers the whole world and enables millions of computers from different organizations and people to communicate globally 1mk \*UG\*
- c) World wide web  
 Electronic mail  
 Electronic commerce  
 Electronic learning ½ mk each\*UG\*
- 11.a) Microwave  
 Satellite  
 Radio transmission ½ mk each\*UG\*

b) Fourth generation

Make programming an easier task by presenting the programme with more programming tools i.e. buttons, form e.t.c The Program selects graphical objects on the screen called control and uses them to create design or a base form .Also application generator can work behind the scene to generate necessary code.  
½ mk

12.a)  $^{15}_{10} - ^8_{10}$  binary form\*UG\*

Count  $^8_{10}$  to its binary equivalent  
Then write its twos compliment

00001000= 11110111 once compliment

Twos compliment = 11110111 + 1 =11111000 ½ mk

Add the twos compliment to the binary  
Equivalent of  $^{15}_{10} = 00001111_2$  ½ mk

Add

$00001111 + 11111000 = (1) 00000111_2$  ½ mk  
↑  
(overflow bit ignore it)

Therefore  $^{15}_{10} - ^8_{10}$  is a positive number

$00000111_2 = ^7_{10}$  Ans ½ mk  
**Total 2 mks**

11. b) Third generation\*UG\*

Also called structure or procedural. It makes it possible to break a program into components called modules each performing a particular task ½ mk

12. b) i) **Source program**\*UG\*

Refers to the program code that the programmer enters in the program editor window that is not yet translated into machine readable form ½ mk\*UG\*

**Object code**

Refers to the program code that is in machine readable ½ mk\*UG\*

**Translator**

Refer to language processors such as assembler, interpreters and compilers that counts the source program into object code ½ mk\*UG\*

13. **Disk Defragmenter**- It is a tool used to rearrange scattered folder and files on a storage media in order to speed up access to files and folders ½ mk\*UG\*

**Partitioning a disk**- Refers to the process of dividing a large physical disk into two or more portions called logical drives, and then they can be accessed as if it is a separate disk thus creating more space. ½ mk\*UG\*

## Compressing

Compressing storage media contents to fit in smaller space helps to create more free space on the media  
½ mk \*UG\*

- 14.a)1. When the user intends to install more than one operating system on the same disk install each other on a separate partition  
½ mk \*UG\*
2. For the purpose of backup on the same disk but different function, so that if one partition fails, the others will be still working  
½ mk \*UG\*
- b) Graphical based ½ mk  
Layout based ½ mk
- c) Flat file  
Net work  
Hierarchical  
Relational  
½ mk each \*UG\*
- 15.a) Functional are inbuilt predefined formula that the uses quickly uses instead of having to create a new one each time a calculation has to be carried out  
½ mk \*UG\*
- Formular are user defined mathematical expressions that create relationship between cells and return a value in chosen cells  
½ mk \*UG\*
- b) Lables  
Values  
Formulae ½ mk each \*UG\*
- Functions
- c)i) Cell referencing  
It identifies a cell or a range of cells on the worksheet and shows Microsoft Excel where to look for the value, or data needed to use in a formulae  
½ mk \*UG\*
- ii) Relative  
This is when performing tasks that require referencing, you can use formulae whose cell referencing keep on changing automatically depending on their position in the worksheets.  
½ mk \*UG\*
- iii) Absolute referencing  
These are cell references that always refer to cells in a specific location of the worksheet cell if they are copied from one cell to another  
½ mk \*UG\*
- d) Data Integrity  
Refers to the accuracy and completeness of data entered in a computer or received from the information system .It is measured in terms of accuracy, timelines and relevance of data  
½ mk \*UG\*
- e) **Transcription errors**  
Occur during data entry such errors include misreading and transposition error  
½ mk \*UG\*
- Transposition errors**  
Incorrect arrangement of character i.e. putting characters in the wrong order 396 instead of 36g
- g)i) **Audit tail**  
This is a careful study of an information system by experts in order to establish or find out all the weakness in the system that could lead to security threats and weak access point for orimestews ½ mk \*UG\*
- ii) Data encryption

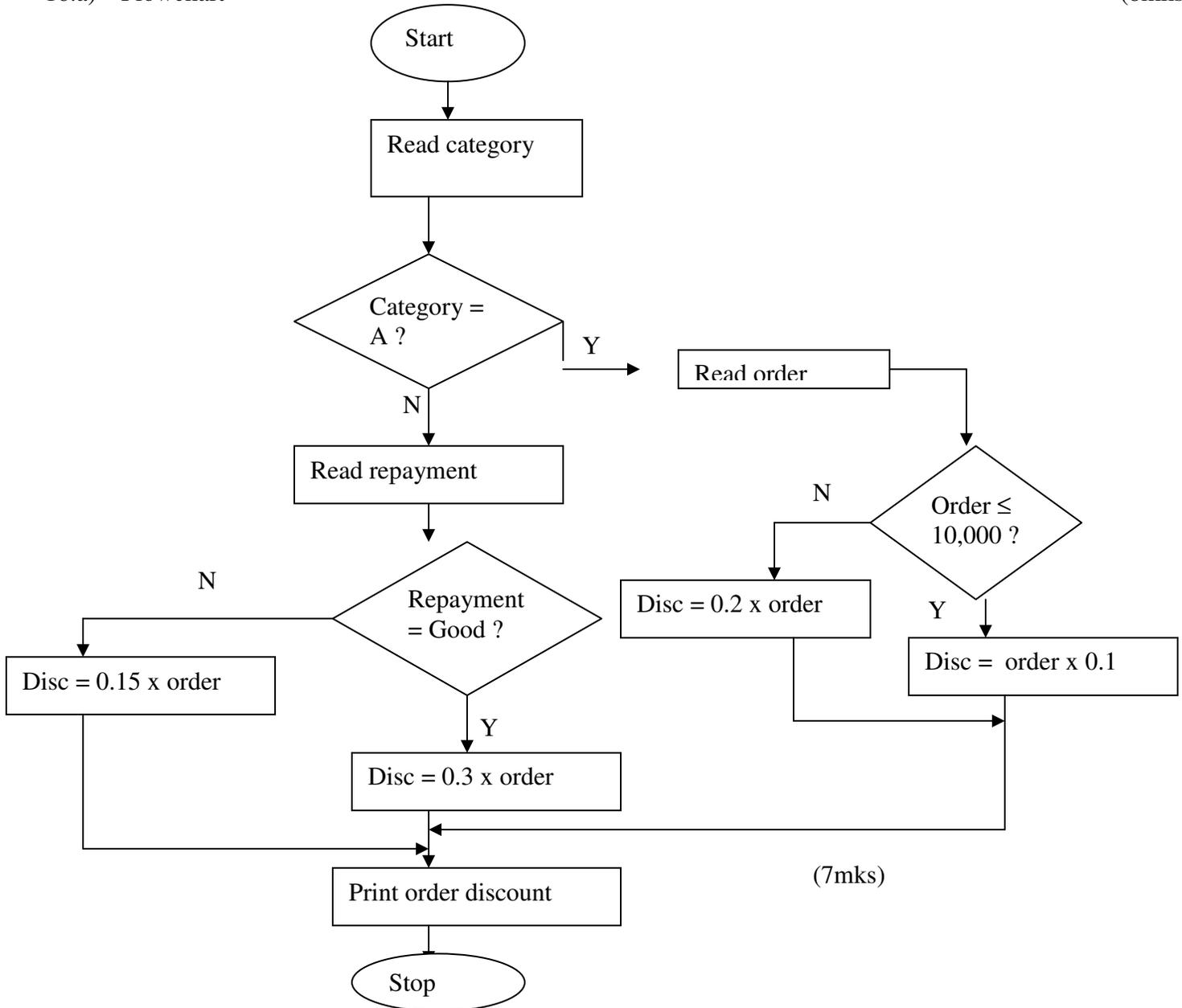
This is protection of data from being tapped listened or copied by mixing it up into a form that only the sender and receiver can be able to understand ½ mk \*UG\*

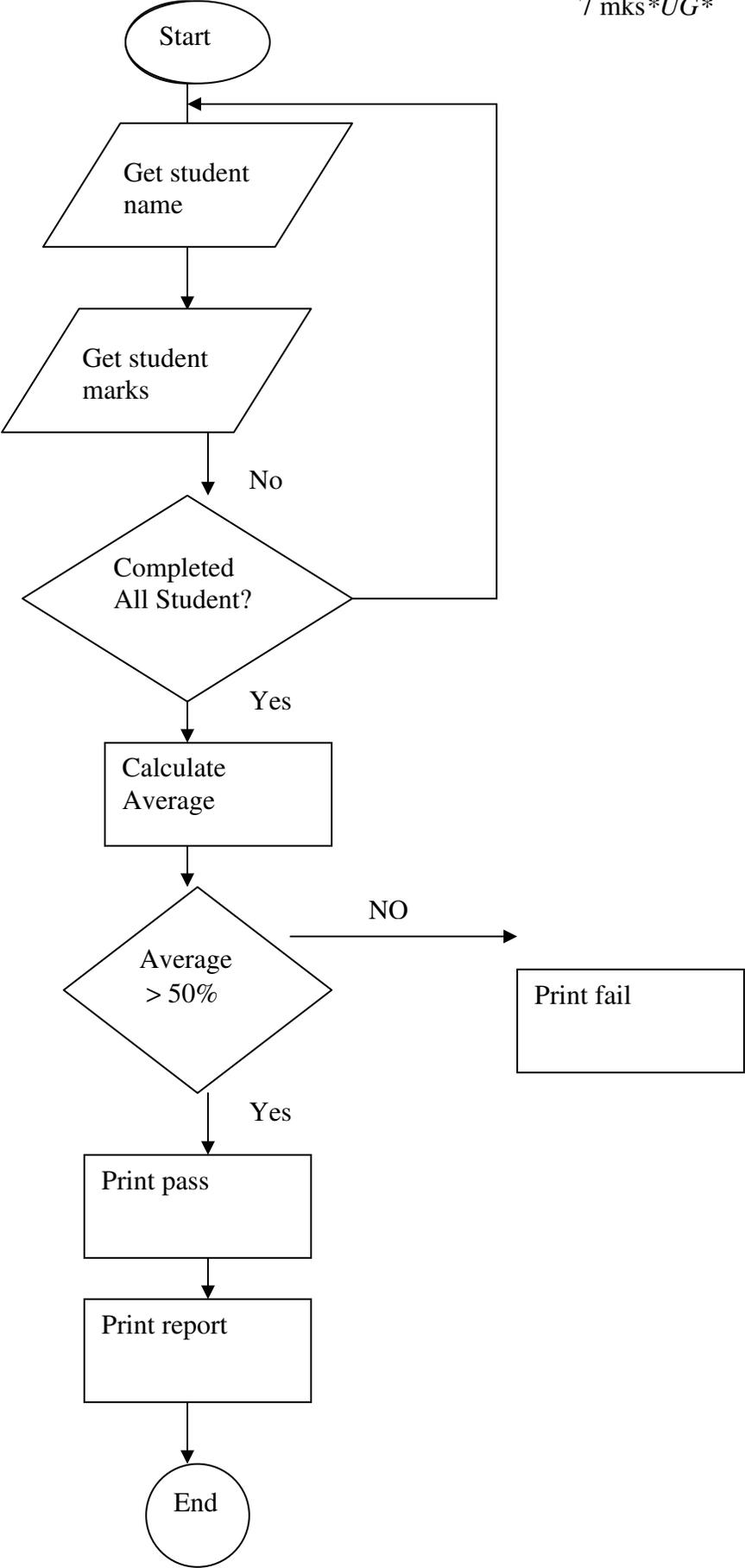
- ii) Log files  
These are special system files that keep a record (log) of events on the use of the computers and resources of the information system ½ mk \*UG\*
- iii) Fire walls  
This is a device or software system that filters the data and information exchanged between different networks by enforcing the host networks access control policy. The aim is to monitor and control access to or from protected networks ½ mk \*UG\*

**SECTION B 60 MKS \*UG\***

16.a) Flowchart

(8mks)





17. Network topology \*UG\*
- Refers to the way in which computers and other devices have been arranged or how data is passed from one computer to another in the network (1mk)
- b) Types of computer network topologies \*UG\*
- Star topology
  - Bus topology
  - Ring topology
  - Mesh topology
  - Tree / therarchical topology (1 x 3mks)
- c) Fucntions of network operating system. \*UG\*
- Provides access to network resources
  - Supports interprocess communication
  - Enables nodes on the network to communicate with each other more efficiently
  - Respond to requests from application programs running on the network
  - Support network services like network card drivers and protocols
  - Implementing networks security features (1x 4 mks)
- d) i) E-mail \*UG\*
- This is the exchange of electronic letters, data and graphics on the internet (1mk) \*UG\*
- ii) E-commerce \*UG\*
- This is a business strategy where goods and services are being sold over the internet .
  - There is no physical, interaction between seller and buyer (1mk) \*UG\*
- iii) E-learning \*UG\*
- This is learning through interaction with special programs on the computer.(1mk) \*UG\*
- e) Ways of reducing piracy
- Enact laws that protect the owners of data and information against piracy
  - Make software cheap enough to increase affordability
  - Use licenses and certificates to identify originals
  - Set installation passwords that deter illegal installation of software (1x4)
- 18.a) Data communication\*UG\*
- Refers to the process of transmitting data signal from one point to another through the network (1mk)
- b) i) Bandwidth\*UG\*
- This is the maximum amount of data that a transmission medium can carry at any one time (1mk)
- ii) Attenuation\*UG\*
- This is the decrease in magnitude and energy as a signal progressively moves along a transmission medium. (1mk)
- c) i)LAN\*UG\*
- Local area network is a computer network that spans a relatively small geographical area like in one building or a school. Usually owned by an organization (1mk)
- ii) MAN \*UG\*
- Metropolitan area network is a network that cover a medium – size geographical area like a town or a city
  - They cover a radius of approximately 10km and have data rates of 100 mbps (1mk)
- iii) WAN\*UG\*
- Wide area networks cover unlimited geographical areas e.g. across states, entire country or the whole world.
  - Consists of many LANS and MANS connected together (1mk)

- di) What are robots\*UG\*
- Robots computer controlled devices usually in form of mechanical and are used to manipulate objects (1mk)
- dii) Advantages of Robots\*UG\*
- They do not make mistakes i.e. They are accurate
  - They work under hazardous conditions
  - They can perform a wide variety of tasks
  - Are quite efficient
  - Work tirelessly for long hours
  - Are quite fast ½ mk each (2mks)
- e) i) Simplex\*UG\*
- A transmission mode which allows transmission of data in only one direction. There is no immediate feedback e.g. the radio broadcasting (2mks)
- ii) Full duplex\*UG\*
- A transmission mode which allows transmission of data in two directions, but only one direction at a time e.g. the police radio calls (2mks)
- iii) Duplex\*UG\*
- A transmission mode which allows transmission of data in two directions concurrently e.g. telephone transmission (2mks)
19. a) i) Computer Engineers\*UG\*
- This is a person who is skilled in designing and developing computer components such as storage devices and other electronic components (1mk)
- ii) Software Engineers\*UG\*
- This is a person who is skilled in software development and technical operation of a computer hardware. (1mk)
- iii) Computer technician\*UG\*
- These are skilled persons who maintain, upgrade and repair computers to ensure that all the devices are in good working condition (1mk)
- b) Duties of an information system manager\*UG\*
- Making sure that all tasks in the IT department are done correctly and on time
  - Preparing budgets for the departments
  - Keeping the department inventory records up-to-date
  - Managing the human resource within the department (Any 3 x 1) 3mks
- c) i) Universities – Kenyatta, Nairobi, JKUAT, Egerton Universities\*UG\*
- ii) Polytechnics – Kenya, Mombasa, Eldoret, Kisumu poly
- iii) College – Institutes e.g. Rift valley and private colleges e.t.c (1x3)
- d) Formatting features\*UG\*
- Changing fonts (type, style and size)
  - Changing text colour
  - Underlining
  - Bolding
  - Italising ( ½ x 4) (2mks)
- e) Defn. of electronic spreadsheet\*UG\*
- An electronic spreadsheet is an application software consisting of a series of rows and columns that form cells and are used for the manipulation of numeric data (1mk)
- f) i) Range\*UG\*
- A range is a rectangular arrangement of cells specified by the address of its top left and bottom right cells, separated by a colon(:) e.g. (A1: B8) (1mk)

ii) **“What if” analysis**\*UG\*

- This involves changing the value of one of the arguments in a formula to see the difference the change would make on the result of the calculation

iii) **Automatic recalculation**\*UG\*

- This is a feature in electronic spreadsheet which automatically adjusts the result of a formula if the values in worksheet are changed (1mk)

20. a) **Definition of information system**\*UG\*

- An information system is an arrangement of people, data processes and information that work together to support and improve the day-to-day operations in a business and the decision making process (1mk)

b) **Reasons for developing a new information system**\*UG\*

- New opportunities- A chance to improve quality of internal processes and services delivery in the organization
- Problems – Undesirable circumstances that prevent the organization from meeting its goals
- Directives - new requirements imposed by the government, management or external influences  
1x3 (1 mk each)

c) **Characteristics of a system**\*UG\*

- Is made up of various components which must work together as a unit to achieve its overall goals
- Is made up of different sub-systems
- Has a space or boundary within which the components operate.
- Has a particular task to perform
- Transforms or process data from one state to another.
- It decays naturally over time due to improvement in technology
- It communicates with its environment by receiving inputs and giving outputs.
- It can receive input from and give output to the environment or not. i.e (its either open or closed system)  $\frac{1}{2} \times 6$  (3mks)

d) **Data processing**\*UG\*

- These are activities that are concerned with the systematic recording, arranging, filing, processing and dissemination of facts relating to the physical events occurring in the business using data processing aids such as computers (1mk)

e) **Qualities of good information**\*UG\*

- Must be relevant for the intended purpose
- Must be accurate and comprehensive
- It is obtained from a reliable source
- It is communicated to the right person and in time
- it is understandable by the user  $(\frac{1}{2} \times 5)$  (2  $\frac{1}{2}$  mks)

f) **File organization methods**\*UG\*

- Sequential
- Random
- Serial
- Indexed sequential  $(\frac{1}{2} \times 3)$  1  $\frac{1}{2}$  mks)

g) i) **Master file**\*UG\*

- This is the main file that contains permanent data against which transactions are processed

ii) **Transaction file**\*UG\*

- Includes input and output files for holding temporary incoming or outgoing data (1mk)

iii) **Backup files**\*UG\*

- These are files used to hold copies (Backups of data or information from the computer fixed storage (hard disk) (1mk)