IT WORKSHOP
GXESL 208

Lab Record

Semester 2

Name of Student : ....

KTU ID : ....

Branch : ....

DEPARTMENT
OF
ELECTRONICS & COMMUNICATION ENGINEERING
COLLEGE OF ENGINEERING, TRIVANDRUM

CERTIFICATE

Certified that this is a bonafide record of work done by

Name: . . . .

KTU ID: . . . .

in the **GXESL208 - IT Workshop** during the academic year . . . .

Signature of Faculty

List of Experiments

Experiment 1

Computer Hardware Familiarization

Experiment Objective:

Equipment/Material required:

CPU Box (Chassis)

1. List the typical materials used for constructing a CPU chassis.

2. Identify the form factor of the CPU case provided to you.

3. Identify the types of form factors supported by different chassis.

4. List the cooling mechanisms commonly integrated into a CPU chassis.

Feature	Details
Materials Used	
Form Factor	
Supported Form Factors	
Cooling Mechanisms	

Motherboard

1. Identify your motherboard model.

2. Google your motherboard model number and list the technical specifications of the motherboard, including form factor, chipset, and socket type.

Feature	Details
Motherboard model	
Form factor	
Chipset	
Socket type	

3. Identify the types and number of RAM slots available.

4. Describe the input/output ports provided on the motherboard.

5. Identify components on the motherboard provided and draw a layout.

6. Refer to the website https://motherboarddb.com/motherboards/ choose a motherboard manufactured after the year 2010 and list the following features :

Feature	Details
Manufacturer	
Year of Manufacture	
Form Factor	
Chipset	
Memory	
Number and Type of USB Ports	
Video Outputs	
Network Ports	
Audio Ports	
Audio Chipset	
Expansion Slots	
Power Connectors	

CPU and Chipset

1. List the key specifications of a typical CPU (like clock speed, core count, and cache size).

2. Explain the terms power consumption and thermal design power (TDP) of a CPU.

3. Refer to the website https://www.techpowerup.com/cpu-specs/ choose a CPU manufactured after the year 2010 and list the following features :

Feature	Details
Manufacturer	
Year of Manufacture	
Socket	
Process Size	
Frequency	
Number of Cores	
Cache	
Memory Support	
TDP	
Production Status	

Storage Devices

Hard Disk Drive

1. List the technical specifications of the hard disk provided to you including storage capacity, RPM, and interface type.

2. Explain the differences between SATA, SAS, and IDE hard disks.

3. Refer to the website https://smarthdd.com/database/ choose a Hard Disk Drive (HDD) and list the following features :

Feature	Details
Manufacturer	
Model	
Capacity	
Interface	
Maximum Interface Speed	
Maximum Read Speed	

Solid State Drive

1. Refer to the website https://smarthdd.com/database/ choose a Solid State Drive (SSD) and list the following features :

Feature	Details
Manufacturer	
Model	
Capacity	
Interface	
Maximum Interface Speed	
Maximum Read Speed	

2. Compare the features of the HDD's and SSD's.

Interface Cards

1. List the technical specifications of a graphics card, including VRAM, clock speed.

2. Identify the ports available on interface cards, such as HDMI, DisplayPort, or audio jacks.

3. Describe the cooling mechanisms for interface cards.

4. Refer to the website https://www.techpowerup.com/gpu-specs/ choose a GPU manufactured in the year 2003 and list the following features :

Feature	Details
Manufacturer	
Year of Manufacture	
GPU Name	
GPU Clock	
Memory Size	
Graphics Features	
Bus Interface	
Production Status	

5. Refer to the website https://www.techpowerup.com/gpu-specs/ choose a GPU manufactured after the year 2020 and list the following features :

Feature	Details
Manufacturer	
Year of Manufacture	
GPU Name	
GPU Clock	

Memory Size	
Graphics Features	
Bus Interface	
Production Status	

Card Slots

1. List the types of card slots available on a motherboard and their respective uses.

Cables

1. Refer to the website https://www.cablestogo.com/learning/connector-guides/internal and list the types of cables used in a computer and their specific purposes.

Cable Type	Purpose
Power Cables	
Molex Connectors	
SATA Power Connectors	
SATA Data Cables	
IDE/PATA Cables	
Floppy Drive Cables	
Front Panel Connectors	
Power Switch Connector	
Reset Switch Connector	
LED Indicators	

2. Describe the data transfer rates of different generations of SATA cables.

SMPS (Switch Mode Power Supply/PSU)

1. List the power ratings and efficiency certifications of SMPS units.

2. Identify the types of connectors provided by an SMPS for various components.

Connector Type	Purpose
24-Pin ATX Connector	
4-Pin/8-Pin EPS (CPU Power) Connector	
6-Pin/8-Pin PCIe Power Connector	
SATA Power Connector	
Molex 4-Pin Connector	
Floppy Drive Power Connector (Berg Connector)	

3. Describe the cooling mechanisms and protections (e.g., overvoltage) in an SMPS.

4. Refer to the website https://www.cybenetics.com/index.php?option=power-supplies choose a Power Supply Unit (PSU) and list the following features :

Feature	Details
Manufacturer	
Form Factor	
Wattage	
Efficiency Rating	

NIC (Network Interface Card)

1. List the technical specifications of a NIC, including speed and connection type.

2. Describe the difference between wired and wireless NICs.

3. Refer to the website https://www.scan.co.uk/shop/computer-hardware/network-cards-accessories/rj45-network-cards choose a network card and list the following features :

Feature	Details
Manufacturer	
Interface	
Supported Data Rates	

Various Ports

1. Refer to the website https://newnex.com/usb-connector-type-guide.php and list the technical specifications of USB ports, including version and data rates.

USB Version	Data Rate
USB 1.0	
USB 1.1	
USB 2.0	
USB 3.0	
USB 3.1	
USB 3.2	
USB4	
USB4 Version 2.0	

2. Refer to the website https://www.xenarc.com/different-types-of-monitor-ports.html and list the common display ports in a computer and their typical applications.

Display Port	Typical Application
VGA (Video Graphics Array)	
DVI (Digital Visual Interface)	
HDMI (High-Definition Multimedia Interface)	
DisplayPort	
USB-C	

| Thunderbolt 3 / 4 | |
| SDI (Serial Digital Interface) | |

I/O Devices

1. List the specifications of common input devices, such as DPI for mice or key travel for keyboards.

2. Refer to the website https://www.displaydb.com/brands and list the following features of a computer monitor :

Feature	Details
Brand	
Model	
Size	
Panel Type	
Refresh Rate	
Screen Aspect Ratio	
Screen Resolution	

3. List the connectivity options available for computer printers.

Buses

1. Explain the function of the address bus, data bus and control bus in a computer system.

Firmware

1. List the features of BIOS and UEFI firmware.

Feature	BIOS	UEFI
Boot Method		
Maximum Drive Size Support		
Secure Boot Support		
Boot Speed		
User Interface		

2. Explain how firmware updates improve hardware functionality.

3. Describe the role of firmware in initializing hardware during startup.

Result :

Student has to enter his/her KTU ID on all pages of the record

Experiment 2

Familiarizing Basic Unix/Linux Commands

Experiment Objective:

Equipment/Material required:

Command: `ls`
Function:

Sample Command:

Output:

Command: `mkdir`
Function:

Sample Command:

Output:

Command: `cp`
Function:

Sample Command:

Output:

Command: `mv`

Function:

Sample Command:

Output:

Command: grep
Function:

Sample Command:

Output:

Command: rmdir
Function:

Sample Command:

Output:

Command: chmod
Function:

Sample Command:

Output:

Command: useradd
Function:

Sample Command:

Output:

Command: `passwd`
Function:

Sample Command:

Output:

Command: `history`
Function:

Sample Command:

Output:

Command: `dmesg`
Function:

Sample Command:

Output:

Command: `cpuinfo`
Function:

Sample Command:

Output:

Command: `uname`
Function:

Sample Command:

Output:

Command: du
Function:

Sample Command:

Output:

Command: time
Function:

Sample Command:

Output:

Command: write
Function:

Sample Command:

Output:

Command: fdisk
Function:

Sample Command:

Output:

Result :

Student has to enter his/her KTU ID on all pages of the record

Experiment 3

Familiarization of Boot process

Experiment Objective:

Equipment/Material required:

Perform the experiment and record answers to the questions below:

1. List the steps in boot process of a computer

2. Explain the purpose of POST in the boot process?

3. Pressing which key during startup on the computer provided to you provides access to BIOS/UEFI settings.

4. List the BIOS version and the name of manufacturer

5. Under the boot devices listed in Boot settings of the BIOS

6. Is the BIOS in the given PC a Legacy BIOS or UEFI. Where is this information displayed in the BIOS settings

7. List the Boot Device order

8. Identify the bootloader and boot options it provides.

9. Explain the function of bootloader in boot process

10. Record any error messages or warnings displayed on-screeen during boot.

11. Record the approximate time taken for the system to boot.

Result :

Student has to enter his/her KTU ID on all pages of the record

Experiment 4

Familiarizing installation of Linux and Windows OS

Experiment Objective:

Equipment/Material required:

Perform the experiment and record answers to the questions below:

1. Identify the tool used to create a multi-OS bootable USB.

2. Define GParted and explain how it is used in partition management.

3. Compare between MBR and GPT partitioning schemes.

4. Compare ext4, NTFS, and FAT32 file systems. When should each be used?

5. Describe the partitioning scheme used for dual-boot Windows10/Ubuntu installation.

6. Analyze the role of the GRUB bootloader.

7. Justify the advantages of using a separate '/home' partition in Linux.

8. How do you modify the default boot OS in a dual-boot system.

Result :

Student has to enter his/her KTU ID on all pages of the record