***This part was performed by Hennadiy Rumiantsev.***

Control Qustions:

1. A hypervisor or virtual machine monitor is a computer program or processor hardware that enables the simultaneous and parallel execution of multiple virtual machines, each running its own operating system. There are two types of hypervisors, the hypervisor of the first type is easiest to perceive as a specific compact operating system that is installed directly on a PC and has the main features of an OS, and hypervisors of the second type are programs that allow you to create virtual machines on their main OS

2. Virtual box makes it possible to use it as a training machine, clone an existing machine in the hypervisor, manage the network, allocate PC resources for their use, also has the functionality of creating virtual networks to work with them, without of that you can clon existing OS, which you have installed recently, also has built-in drivers in a virtual disk image that can be downloaded and use on most of the currently existing operating systems the full functionality of a virtual machine

1 1. You need to download Virtual Box and ISO image of the system

2 Create a virtual machine in the hypervisor, assign machine resources, create a virtual hard disk, assign a system image, the Internet, and start the machine

3. Install and start working

2. A 64-bit computer architecture provides higher performance than a 32-bit architecture by processing twice as many bits of information in the same clock cycle. A computer with a 32-bit processor can only run a 32-bit operating system and 32-bit software. But a computer with a 64-bit processor can run both 64-bit and 32-bit operating systems and software.

3 It is necessary to select the packages to be installed, partition the disk, connect the PC to the network, enter the login for logging in to the system and the password, as well as the keyboard layout and the desire or unwillingness to install GRUB, after that it is desirable to update the system using the terminal commands sudo su, apt-get update && apt-get dist-upgrade -y

4. sudo su

Apt-get update && apt-get dist-upgrade -y

Apt-get install ubuntu-desktop or apt-get install kde

Select the gdm3 or lightdm login manager and press Enter: Linux Settings.

Sudo reboot

5 As Linus Torvalds said about Gnome, it is an environment for idiots and its creators also consider the user an idiot, which I agree with, an inconvenient application selection window, requiring as many resources as KDE, but the design is much worse, the left inconvenient taskbar

Jwm - a more convenient working environment similar to Windows 7 in some sense, a convenient taskbar and generally an interesting interface

***This part was performed by Malamyzh Volodymyr.***

**Tasks for preliminary preparation.**

1. Type 1 hypervisor – virtual machine monitor

Machine simulators - the ability to simulate toolpaths on a digital twin of your machine  
Binary translation -  is asoftware virtualization and includes the use of an interpreter.

Type 2 hypervisors – its hypervisors who use hybrid strategy and have many other improvements as well.

Host operating system - is the software installed on a computer that interacts with the underlying hardware.

Guest operating system - is the operating system installed on either a virtual machine (VM) or partitioned disk.

JVM - is a virtual machine that runs Java class files in a portable way.  
Operating system - is software that runs on a computing device and manages the hardware and software components that make up a functional computing system.

Kernel-based Virtual Machine (KVM) is an open source virtualization technology built into Linux.

VirtualBox is open-source software for virtualizing the x86 computing architecture.

Hyper-V is Microsoft's hardware virtualization product. It lets you create and run a software version of a computer, called a virtual machine.

***Control questions***

1. Hypervisor first type are used as a second OS, and hypervisors of the second type are programs that allow you to create virtual machines on their main OS.

2. The GNU General Public License (GNU) is a free software license originally written by Richard Stallman of the Free Software Foundation, which guarantees that users are free to use, share, and modify the software without paying anyone for it.

3. Open source software is software with source code that anyone can inspect, modify, and enhance.n kit is a set of files intended for installing them on end-user computers. A

4. A distributiodistribution kit includes the installation program setup.exe and an archive with delivery files.

5. System administration tasks that can be implemented on the basis of Linux:

* Shell scripting
* installation (setup) of the OS;
* managing the OS boot process;
* setting the operating modes of the OS;
* editing configuration files;
* mounting and unmounting file systems;
* adding and removing OS users;
* update the software;
* configuring the OS kernel;
* ensuring reliable operation of the OS;
* configuring a computer network.

6. Android is an operating system and platform for mobile phones and tablet computers created by Google based on the Linux kernel. Although Android is based on the Linux kernel, it stands somewhat apart from the Linux community and Linux infrastructure.

7. Linux allows multiple software, development, and support vendors; it has a stable kernel and provides the ability to read, modify, and redistribute source code. Embedded systems are used in a variety of industries, including Industrial Machines, automobiles, cameras, vending machines, toys etc.

8. *echo "manual" | dd of=/etc/init/lightdm.override*

I was told this makes me select the runlevel on start

*systemctl isolate runlevel3.target*

Here, I was told it changes into runlevel 3 without booting, but it simply made the display pitch black.

If you need to switch to text mode with no GUI stuff like the X server running, you can use systemctl to get your machine to the so-called multi-user.target:

*sudo systemctl start multi-user.target*

You revert this and get back to the desktop (graphical.target) by either rebooting or by switching back manually in the same way as above:

*sudo systemctl start graphical.target*

GUI lets a user interact with the device/system with the help of graphical elements, like windows, menus, icons, etc. The CLI, on the other hand, lets a user interact with their device/system with the help of various commands.