

COMPUTER HARDWARE AND SERVICING

Q.P CODE: 618
SUBJECT CODE: 35261

PART A

(Each question carries 2 marks, Answer any FIVE questions, Q. No. 8 – Compulsory)

1. Define mother board form factor

The form factor describes the general layout of the case, the positioning of the slots in the back of the case, and the way that the case matches to the major components that fit into it. The three main components that must be matched in terms of their form factor are the case, the power supply, and the motherboard.

2. What is firmware?

Firmware is a type of software that provides control, monitoring and data manipulation of engineered products and systems. Typical examples of devices containing firmware are embedded systems (such as traffic lights, consumer appliances, remote controls and digital watches), computers, computer peripherals, mobile phones, and digital cameras. Firmware is held in non-volatile memory devices such as ROM, EPROM, or flash memory. Changing the firmware of a device may rarely or never be done during its lifetime; some firmware memory devices are permanently installed and cannot be changed after manufacture.

3. List the types of memory errors.

The following are some important memory errors

- (i) Contact Corrosion
- (ii) Parity errors
- (iii) Correct memory size message.
- (iv) The number 164 error.
- (v) New memory is installed but the system refuses to recognize it.

4. Give the full form of LCD and LED.

Light-emitting diode display (LED)

Liquid crystal display (LCD)

5. Define POST.

The POST is a small program contained in the computer's Basic Input/output Operating System (BIOS) that checks to make sure necessary hardware is present and required memory is accessible. If everything tests out correctly, the computer will typically emit a single beep and continue the starting-up process. If something is wrong, the computer will display an error message on the monitor screen and announce the errors audibly with a series of beeps that vary in pitch, number and duration.

6. List the types of adaptor used in laptop.

The following are adaptor used in laptop.

- AC Power Adapter
- DC Power Adapters
- Universal Power Adapters

7. What is mobile communication?

A mobile phone is a portable telephone that can make and receive calls over a radiofrequency carrier while the user is moving within a telephone service area. Mobile phones are used for a variety of purposes, such as keeping in touch with family members, for conducting business, and in order to have access to a telephone in the event of an emergency.

8. List the SMD components of laptop.

- Resistor
- Capacitor
- Diode
- Inductor coil
- Mosfet

PART B

(Each question carries 3 marks, Answer any FIVE questions. Q.No 16 – Compulsory)

9. List the features of Xeon processor.

Xeon features:

- i. It has faster L1 and L2cache , either 512 Kbytes or 1 Mbytes, which runs at the same 400 MHz clock speed of the processor.
- ii. A faster bus to carry data between the processor, RAM, and I/O devices. The 450NXPCIset is a chipset that works at a 100 Mhz clock speed and supports up to 8 GB of extended data output RAM memory.
- iii. A larger Accelerated Graphics Port (AGP) chip set called the 440GX AGP set that also runs at 100 Mhz. It supports 2 GB of 100 MhzSDRAM .
- iv. An extended server memory architecture that provide for 36-bit addresses, allowing up to 64 GB of physical memory to be addressed.
- v. It has 32 or 64 bit instruction set. Figure shows the block diagram of Xeon wood crest processor having two cores.

10. Write any five features of AGP bus.

- i. Texturing: Also called Direct Memory Execute mode, allows textures to be stored in main memory.
- ii. Throughput: Various levels of throughput are offered: 1X is 266 MBps, 2X is 533 MBps; and 4X provides 1.07 GBps.
- iii. Sideband Addressing: Speeds up data transfers by sending command instructions in a separate, parallel channel.
- iv. Pipelining: Enables the graphics card to send several instructions together instead of sending one at a time.

11. Explain the types of formatting.

Formatting a disk for use by an operating system and its applications typically involves three different processes.

1. Low-level formatting (i.e., closest to the hardware) marks the surfaces of the disks with markers indicating the start of a recording block (typically today called sector markers) and other information like block CRC to be used later, in normal operations, by the disk controller to read or write data. This is intended to be the permanent foundation of the disk, and is often completed at the factory.

2. Partitioning divides a disk into one or more regions, writing data structures to the disk to indicate the beginning and end of the regions. This level of formatting often includes checking for defective tracks or defective sectors.

3. High-level formatting creates the file system format within a disk partition or a logical volume. This formatting includes the data structures used by the OS to identify the logical drive or partition's contents. This may occur during operating system installation, or when adding a new disk. Disk and distributed file system may specify an optional boot block, and/or various volume and directory information for the operating system.

12. Explain cold and warm booting.

Cold and Warm booting

Cold booting: Alternatively referred to as a hard boot, cold boot is a term used to describe the process of turning on the computer after it has been powered off. For example, when you first turn your computer on after being off for the night you are cold booting the computer.

Warm Booting: Alternatively referred to as a soft boot, a warm boot is one method of resetting a computer system that is already powered on, commonly used to recover from errors that cannot be recovered, or when a computer locks. A warm boot can be accomplished by pressing the CTRL - ALT - DEL keys simultaneously, or by selecting the restart command from an operating system menu. Warm boots run faster than turning a computer off and on again.

In other words, warm booting is Reloading the operating system by performing a Restart operation from the computer's main menu while it is still turned on. The warm boot does not turn the power off and back on, and it does not clear memory. Contrast with cold boot.

13. Explain active and passive maintenance.

Active and passive maintenance

An active preventive maintenance program includes performing procedures that promote a longer, trouble-free life for your laptop. This type of preventive maintenance primarily involves the periodic cleaning of the system and its components, as well as performing backups, antivirus and antispyware scans, and other software-related procedures.

(i) Back up any data or important files.

(ii) Run a full system antivirus and antispyware scan. Before starting the scans, be sure to check for and install antivirus and antispyware software updates. Note that most of these programs have integrated update routines that automatically check for updates on a weekly or monthly basis, or at some other interval you may choose.

(iii) Run the Windows Disk Cleanup tool, which searches the system for files you can safely delete, such as

a. Files in the Recycle Bin.

b. Temporary Internet files.

c. Windows temporary files.

d. Install programs for previously downloaded and installed programs.

e. System restores points except the most recent restore point.

f. Optional Windows components that you are not using.

g. Installed programs that you no longer use.

(iv) Finally, run a disk-defragmenting program.

Passive preventive maintenance includes precautionary steps to protect a system from the environment, such as using power-protection devices; ensuring a clean, temperature-controlled environment; and preventing excessive vibration. In General,

(i) General system Care and Handling

(ii) Operating Environment

(iii) Temperature, Humidity, altitude

(iv) Static electricity

(v) Radio frequency Interference

(vi) Dusts and Pollutants

14. List the types of batteries and write the basic problems of them.

- Nickel-Metal Hydride Batteries
- Lithium Ion Batteries
- Lithium Polymer Batteries

Problems	Solutions
Laptop shuts off when AC adapter unplugged.	<ol style="list-style-type: none"> 1. The battery not seated correctly. Try reconnecting it. 2. The battery contacts got dirty or oxidized and it's not making good connection with the motherboard. Apply some electronic contact cleaner on the contacts. 3. If reconnecting the battery doesn't help, most likely it's bad and has to be replaced 4. If you replaced the battery but the problem still exists, this is motherboard related failure. Apparently the charging circuit on the motherboard failed. In this case the whole motherboard has to be replaced (or repaired on the component level).
The battery not detected by the laptop.	<ol style="list-style-type: none"> 1. Most likely the battery is bad. You have a very good chance to fix this problem by replacing it with a new one. 2. If replacing the battery doesn't help, this is motherboard related failure. The motherboard has to be replaced (or repaired on component level).
The battery discharges very quickly after it reaches some critical point.	This is battery failed. It has to be replaced with a new one.
The battery charges only if the power plug positioned correctly.	<ol style="list-style-type: none"> 1. AC adapter failure. The AC adapter power cable is damaged. 2. If the AC adapter works fine, most likely this is power jack (connect or where you plug power adapter) failure. In this case the power jack has to be replaced.

15. Define routing and explain its operation.

Routing Definition

Routing is the process of moving packets across a network from one host to another. It is usually performed by dedicated devices called routers. Packets are the fundamental unit of information transport in all modern computer networks, and increasingly in other communications networks as well.

Operations

To define a routing operation you first specify an operation sequence number to indicate the order to perform operations. Components in your bill of material can reference an operation sequence. Next, you can choose either a standard operation, or you can enter a new operation.

Sequence of Operations

Routings define the step-by-step descriptions, or operations, for manufacturing an assembly. Each operation on a routing defines a specific portion of the manufacturing process for the assembly. You can use operations to identify the location, the quantity, and the state of completion of the assemblies you are currently manufacturing.

For each component item on the bill of material associated with a routing, you can specify the operation sequence where you require the item. You can then only issue material where and when it is needed.

Standard Operation

A standard operation is a commonly used operation that you define as a template to default operation information when you define routings. When you define a new operation on a routing, you can

specify a standard operation whose information Bills of Material copies into the operation you are currently defining. You can then change any of the copied information for the new operation.

Setup Standard Operation

A setup standard operation is the same as a standard operation except that it defines an operation used for setting up machine type resources only. Use the setup standard operation to specify the operation used during changeovers.

16. Define graphics card and its applications.

A graphics card is a type of display adapter or video card installed within most computing devices to display graphical data with high clarity, color, definition and overall appearance. A graphics card provides high-quality visual display by processing and executing graphical data using advanced graphical techniques, features and functions.

A graphics card is also known as a graphics adapter, graphics controller, and graphics accelerator card or graphics board. A graphics card enables the display of 3-D images, image pasteurization, higher pixel ratio, a broader range of colors and more. Moreover, a graphics card includes various expansion ports such as AGP, HDMI, TV and multiple monitor connectivity. A graphics card can be integrated within the motherboard or be added on as an extension card.

PART C

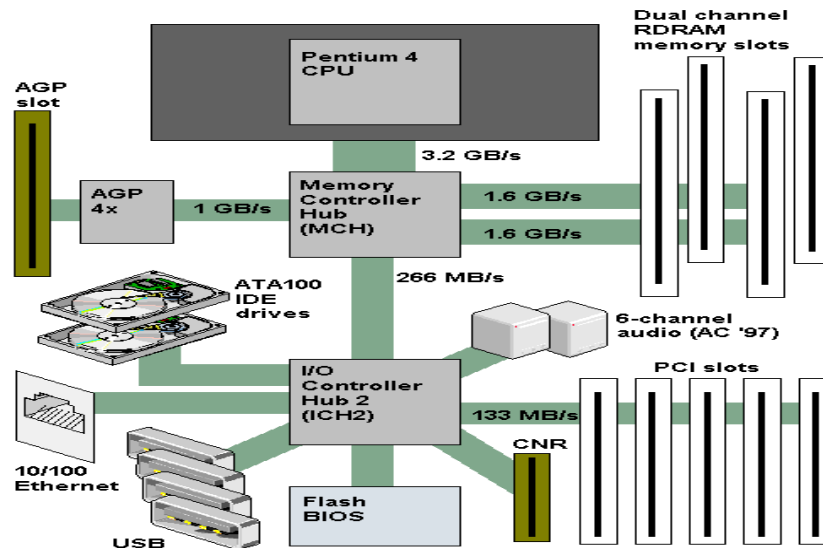
(Each question carries marks, Answer division (a) or division (b))

17. (a) Define chipset and explain hub architecture.

(Chipset 3 mark , hub architecture 7marks)

Chipset definition:

The term chipset often refers to a specific pair of chips on the motherboard: the north bridge and the south bridge. The north bridge links the CPU to very high-speed devices, especially RAM and graphics controllers, and the south bridge connects to lower-speed peripheral buses (such as PCI or ISA). In many modern chipsets, the south bridge contains some on-chip integrated peripherals, such as Ethernet, USB, and audio devices. Manufacturers of chipsets for x86 motherboards include AMD, Broadcom, Intel, NVIDIA, SiS and VIA Technologies.

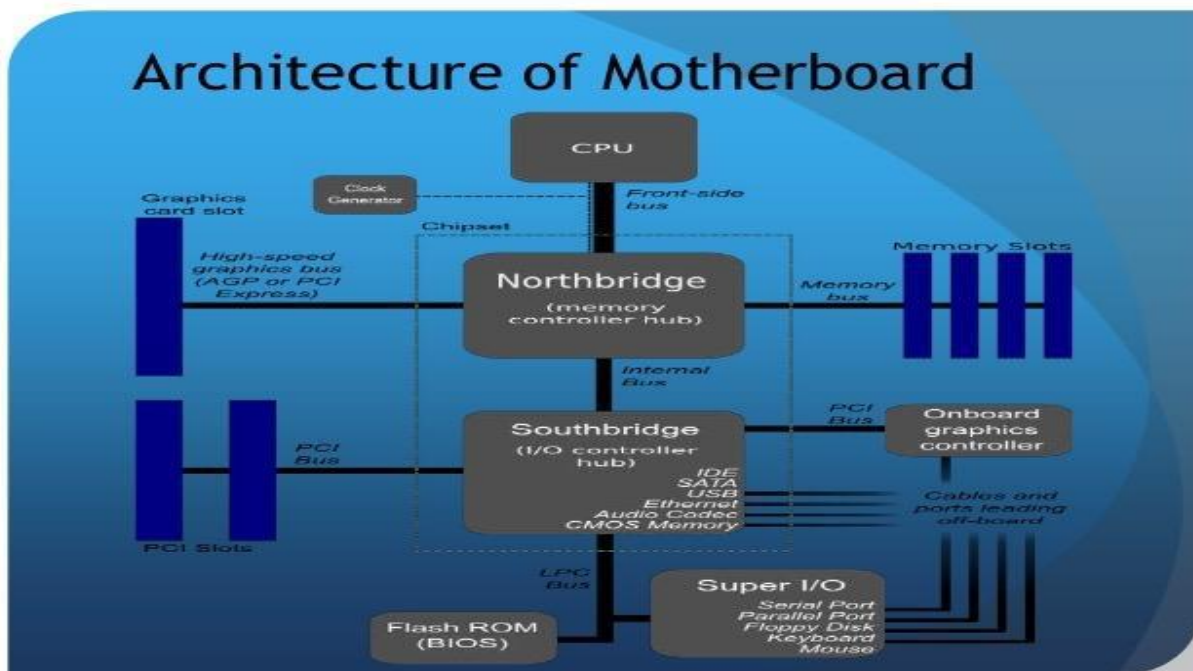


Intel hub architecture starting with the 820 chipset, divides control between a memory controller chip (MCH) and an I/O controller chip (ICH). An illustration of the 850 is shown in figure. The memory controller is a digital circuit that manages the flow of data going to and from the computer's main

memory. A memory controller can be a separate chip or integrated into another chip, or as an integral part of a microprocessor called an integrated memory controller (IMC). A memory controller is also called a memory chip controller (MCC) or a memory controller unit (MCU). Memory controllers contain the logic necessary to read and write to DRAM, and to "refresh" the DRAM. Reading and writing to DRAM is performed by selecting the row and column data addresses of the DRAM as the inputs to the multiplexer circuit, where the demultiplexer on the DRAM uses the converted inputs to select the correct memory location and return the data, which is then passed back through a multiplexer to consolidate the data in order to reduce the required bus width for the operation. Bus width is the number of parallel lines with range between 8-bit to 512-bit. Memory controllers, such as the one integrated into Power QUICC II processors, can be connected to different kinds of devices at the same time, including SDRAM, SRAM, ROM, and memory-mapped I/O. It has error detection and correction hardware facility.

17 (b) Explain motherboard architecture with block diagram.

Motherboard includes peripherals, interface cards, and daughter cards: sound cards, video cards, network cards, hard drives, or other forms of persistent storage; TV tuner cards, cards providing extra USB or FireWire slots and a variety of other custom components. It has no additional expansions or capability, such as controlling boards in laser printers, televisions, washing machines and other embedded systems with limited expansion abilities.



Processor Socket

The processor socket is the central piece of a motherboard that holds the processor (brain of the computer) and it is located near the center of the motherboard.

Power Connectors

The power connector, commonly a 20 or 24-pin connector, can be situated either near the right edge of the motherboard, or somewhere close to the processor socket on older motherboards. Newer motherboards have an additional 4-pin or 8-pin connector near the processor for additional power.

Memory Slots

Located in the upper-right part of the motherboard, the memory slots are used to hold the memory modules. The low-end motherboards have two memory slots. High end memory and gaming slots have 8

memory slots. It is important to pay attention on types of memory a motherboard supports. Newer motherboards support DDR3 memory. The older motherboard model supports different types of memory with two DDR1 memory slots and 2 DDR2 memory slots, or two DDR2 slots and two DDR3 slots. The number of memory slots determines the maximum amount of memory.

Video Card Slot

It is available as PCI-Express slot on newer motherboards or AGP on older ones, the video card slot is situated right below the processor. High-end gaming motherboards come with multiple video card slots, allowing the installation of multiple video cards in a SLI or Crossfire configuration.

Expansion Slots

Expansion slots allow installing additional components and to enhance or expand the functionality of the PC. For example TV tuner, a video capture card, a better soundcard, etc may be installed. These ports are located under the video card slot, and come in the form of PCI slots (on older motherboards) or a scaled-down version of PCI-Express slots (on newer motherboards). Some motherboards come with both types of expansion slots. The number of slots is usually dependent on the format of the motherboard – larger motherboards (full ATX) have more, while smaller formats (micro-ATX) have fewer, if any.

IDE and SATA Ports

IDE and SATA ports are used to provide connectivity for the storage devices and optical drives. The current version of SATA interface achieves maximum speeds of up to 600 MB/s, as opposed to the IDE interface, which can reach a maximum of 133 MB/s.

BIOS Chip and Battery

The BIOS chip contains the basic code that boots the computer up to the point where the operating system takes over. Since the BIOS code is stored on a memory chip that needs constant power to function, a battery is also present to keep the chip powered when the computer is unplugged.

Northbridge and Southbridge

A square metal component located somewhere in the lower-right part of the board. This metal component is actually a heat sink, and its role is to provide thermal protection for the Northbridge – one of the most important components of a motherboard. The north bridge is responsible for coordinating the data flow between the memory, the video card and the processor. A secondary chip, known as Southbridge, has a similar function, coordinating the data flow between the processor and peripherals such as sound cards or network cards.

Front Panel Connectors, USB Headers and Audio Header

The front panel connector is where all the elements present on the front of the case. Power button, reset button, power LED, audio connectors and USB connectors are all connected to the front panel or the corresponding headers.

Rear Connectors

These connectors are the bridge between the outside of the computer and the inside. The connectors are actually located on the left edge of the motherboard; however, since these connectors are accessible from the outside, the name simply implies where they are accessible from – the rear of the PC case. External peripherals such as keyboard, mouse, monitor, speakers and so on are all connected via these connectors.

18 (a) Briefly explain about the recording and playback principles of DVD-ROM.

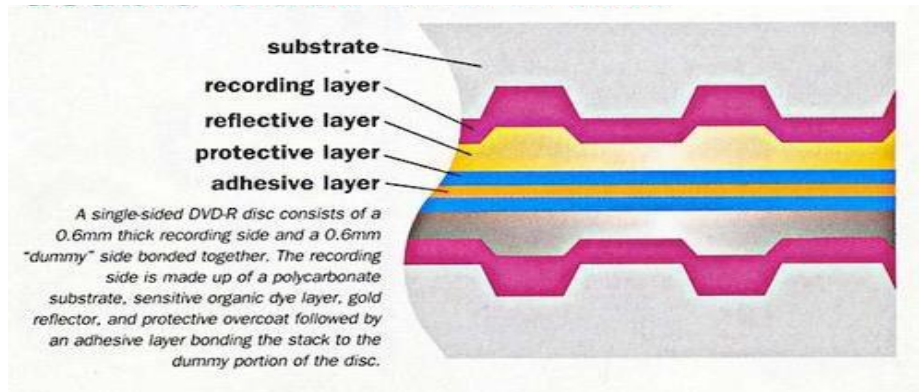
Recording (writing)

Figure shows the cross sectional view of double sided DVD. This is made up of a pre grooved polycarbonate disk. Pre groove is use to guide the laser beam while writing. The pre groove contains

a) A synchronized signal to control the movement of DVD drive's spindle motor during writing. This signal is also called wobble signal.

b) Land pre-pits in the land area between the grooves. This is used for addressing purposes. Over the polycarbonate disk, a think layer of recording dye is sprayed and is used for recording. Then a thin

reflective layer is coated over this for reflecting the laser beam during reading operation. Over this a protective layer is coated and is used to protect the disk from scratch and dust.



There are two types of recording. They are

(i) Disk at Once

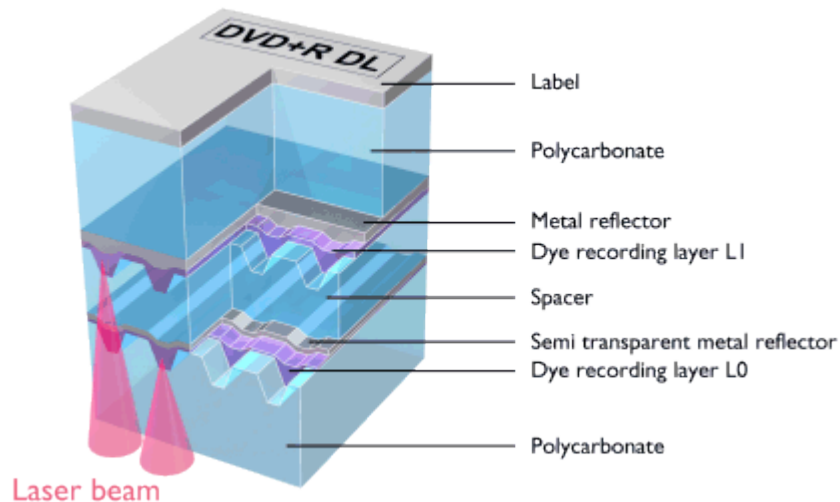
In this type of recording, the 4.7 GB of data is written over the disk at a time with the help of a 635-650 μm laser beam

(ii) Increment

In this type of recording, the 4.7 GB of data are split into number of packets. Then it is written over the disk packet by packet with the help of a laser beam.

Rewritable DVD

Rewritable DVD is a device that be erased and written again and again. The Figure shows the cross sectional view of a single sided 4 layer DVD



Rewritable DVD uses phase-change technology for reading, writing and erasing. The phase change medium consists of a grooved polycarbonate substrate. This has four layers. The phase change (recording) layer namely silver, indium antimony-tellurium is sandwiched between dielectric layers. This layer changes from crystalline state to amorphous state.

Writing

During writing, laser beam of wave length 650μm is used to heat selected spots above 500° -700 °C. So the spots change to liquid state. Then the spots are allowed to cool. After cooling the spots becomes amorphous state.

Reading

To read the data in the DVD, a lower power (read power) laser is made to fall on the surface of the DVD. The amorphous area (pits) reflects less light and crystalline area reflects more light(land). With the help of the difference in reflectivity, we can read the data.

Erasing

To erase the data on the DVD, a medium power (Erase power) laser of temperature 200° C is made to fall on the recording layer. This melts the amorphous area (pits) and reverts back to crystalline state.

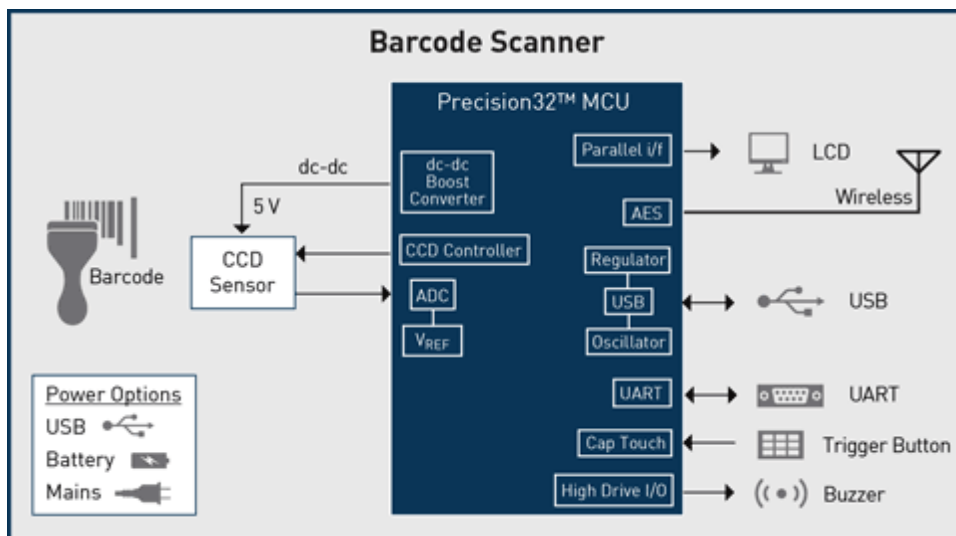
The important features are

- (i) IT uses a 650µm laser for writing.
- (ii) This uses land pre-pits between the grooves for addressing.
- (iii) The pre groove has a synchronized signal to control the DVD drive's spindle motor during writing. This signal is also called Wobble signal.
- (iv) The storage capacity is 4.5 GB.
- (v) It is mainly used for data storage and storing movies.

18 (b) Explain the working principles of bar code scanner.

Barcode Scanner

Barcode scanners have become such a ubiquitous technology that it is easy to take the complexity of their underlying designs for granted. Barcode scanners require multiple discrete integrated circuits and an array of passive and active circuitry to provide the functionality and reliability that end users have come to expect. Many barcode scanners generally use an optical sensor, such as a charge-coupled device (CCD), which outputs an analog representation of what is —visible to the sensor to an analog-to-digital converter(ADC) controlled by a microcontroller (MCU). The MCU interprets the ADC's output as a sequence of thick and thin black and white bars and processes this sequence further to derive a string of characters from the pattern. The character sequence may be encoded in any one of a number of well-defined barcode protocols, such as Code 39. Additional features found in barcode scanners include USB connectivity, regulators, audio output (usually driven by a discrete digital-to-analog converter (DAC) or simple pulse width modulation (PWM)), and other glue logic for level-shifting between components running from 3 volts, such as the MCU, and components running from 5 volts, such as the CCD. Figure shows the Barcode Scanner.



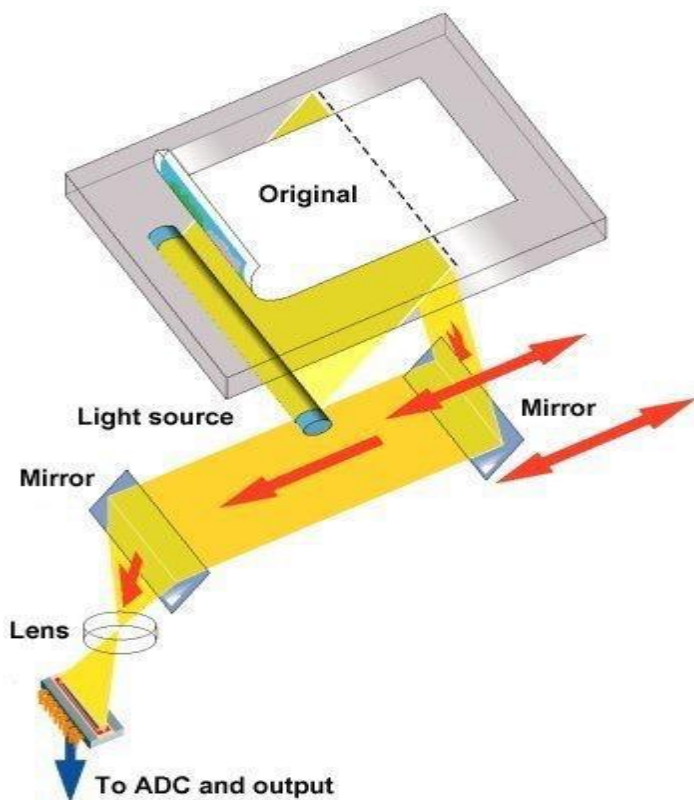
Working principle

All scanners work on the same principle of reflectance or transmission. The image is placed before the carriage, consisting of a light source and sensor; in the case of a digital camera, the light source could be the sun or artificial lights. When desktop scanners were first introduced, many manufacturers

used fluorescent bulbs as light sources. While good enough for many purposes, fluorescent bulbs have two distinct weaknesses: they rarely emit consistent white light for long, and while they're on they emit heat which can distort the other optical components. For these reasons, most manufacturers have moved to cold-cathode bulbs. These differ from standard fluorescent bulbs in that they have no filament. They therefore operate at much lower temperatures and, as a consequence, are more reliable.

Standard fluorescent bulbs are now found primarily on low-cost units and older models. Xenon bulbs had emerged as an alternative light source. Xenon produces a very stable, full spectrum light source that's both long lasting and quick to initiate. However, xenon light sources do consume power at a higher rate than cold cathode tubes.

To direct light from the bulb to the sensors that read light values, CCD scanners use prisms, lenses, and other optical components. Like eyeglasses and magnifying glasses, these items can vary quite a bit in quality. A high-quality scanner will use high-quality glass optics that are colour-corrected and coated for minimum diffusion. Lower-end models will typically skimp in this area, using plastic components to reduce costs.



The amount of light reflected by or transmitted through the image and picked up by the sensor, is then converted to a voltage proportional to the light intensity – the brighter the part of the image, the more light is reflected or transmitted, resulting in a higher voltage. This analogue-to-digital conversion (ADC) is a sensitive process, and one that is susceptible to electrical interference and noise in the system. In order to protect against image degradation, the best scanners on the market today use an electrically isolated analogue-to-digital converter that processes data away from the main circuitry of the scanner. However, this introduces additional costs to the manufacturing process, so many low-end models include integrated analogue-to-digital converters that are built into the scanner's primary circuit board. Figure shows the working principle.

The sensor component itself is implemented using one of three different types of technology:

(i) PMT (photomultiplier tube), a technology inherited from the drum scanners of yesteryear.

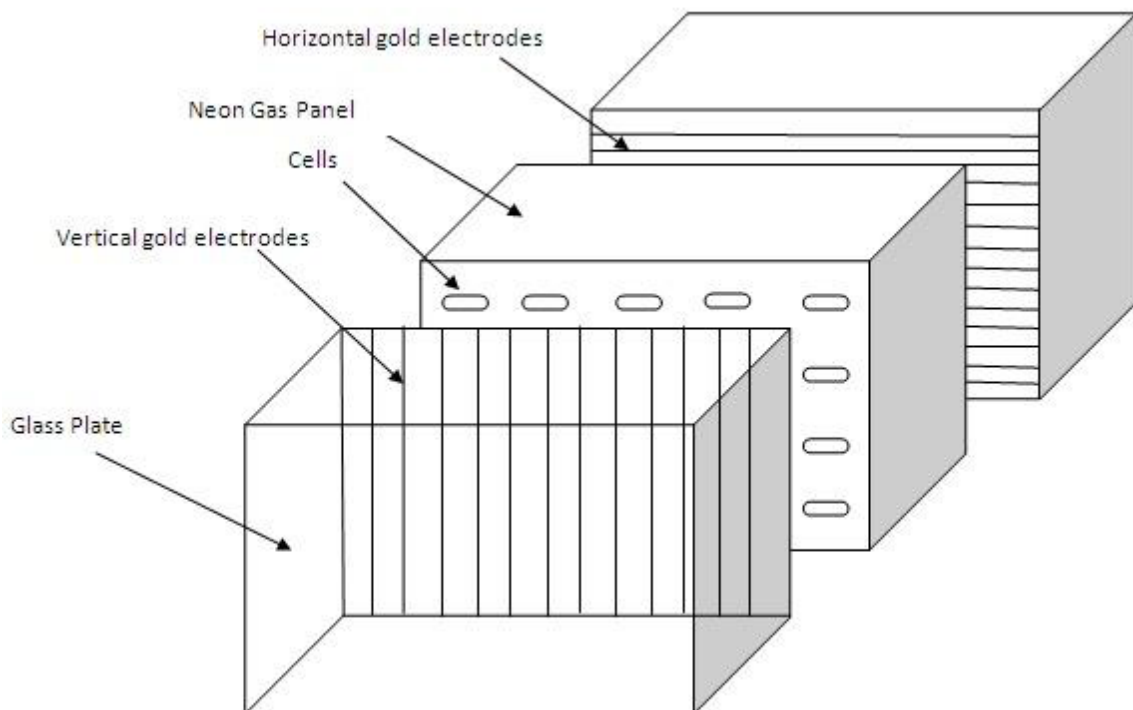
- (ii) CCD (charge-coupled device), the type of sensor used in desktop scanners.
- (iii) CIS (contact image sensor), a newer technology which integrates scanning functions into fewer components, allowing scanners to be more compact in size.

19. (a) Explain working principle of plasma panel.

Plasma displays

Research on plasma displays began in the United States over four decades ago, in 1960. The technology was developed by four researchers: Bitzer, Slottow, Willson, and Arora. The first prototype came out very quickly, in 1964. The matrix, which was revolutionary for its time, consisted of 4 x 4 pixels emitting monochrome blue light. Then, in 1967, the size of plasma matrices increased to 16 x 16 pixels, this time emitting a pale red light, still monochrome, using neon.

Working:



Plasma is referred to be the main element of a fluorescent light. It is actually a gas including ions and electrons. Two plates of glass are taken between which millions of tiny cells containing gases like xenon and neon are filled. It is shown in Figure In a plasma panel display, two glass plates having horizontal and vertical gold electrodes are kept. These gold electrodes are covered with dielectric material. In between these two glass plates there is another glass plate filled with neon gas.

When voltage is applied through the gold electrodes the neon gas is split into independent cells and they start to glow. By applying voltages through the gold electrodes this glow can be controlled, thus, creating a display. No refresh is required in a Plasma panel display. This also includes the collision between the ions and electrons resulting in the emission of photon light.

Plasma TV Resolutions

The resolution of a plasma display varies from the early enhanced definition [ED], to the modern high-definition displays. The most common ED resolutions were 840*480 and 853*480. With the

emergence of HDTV's the resolution also became higher. The modern plasma TV's have a resolution of 1024*1024, 1024*768, 1280*768, 1366*768, 1280*1080, and also 1920*1080.

Advantages of Plasma Display

- (i) Very high contrast ratios [1:2,000,000].
- (ii) Weighs less and is less bulky than CRTs.
- (iii) Higher viewing angles compared to other displays [178 degrees].
- (iv) Can be placed even on walls.
- (v) High clarity and hence better colour reproduction.
- (vi) Has a life span of about 100,000 hours.

Disadvantages of Plasma Display

- (i) Cost is much higher compared to other displays.
- (ii) Energy consumption is more.
- (iii) Produces glares due to reflection.
- (iv) These displays are not available in smaller sizes than 32 inches.
- (v) Glass screen, which is needed to protect the display, is included, weighs more.
- (vi) Cannot be used in high altitudes. Area flickering is possible.

19 (b) Explain BIOS error codes.

BIOS error codes

A beep code is the audio signal given out by a computer to announce the result of a short diagnostic testing sequence the computer performs when first powering up (called the Power-On-Self-Test or POST).

The POST is a small program contained in the computer's Basic Input/output Operating System (BIOS) that checks to make sure necessary hardware is present and required memory is accessible. If everything tests out correctly, the computer will typically emit a single beep and continue the starting-up process. If something is wrong, the computer will display an error message on the monitor screen and announce the errors audibly with a series of beeps that vary in pitch, number and duration. The beeping sequence is really a coded message (beep code) designed to tell the user what is wrong with the computer. Some number of short beeps that are sounded by the BIOS upon startup when a memory, cache or processor error is encountered. There are numerous beep code patterns, and Phoenix BIOS codes are long and short beeps delivered in groups.

Beep state	Meaning
1 long beep followed by 2 short beeps	Video configuration failure (a faulty video card or no card installed), or an external ROM module does not properly checksum to zero.
1	Refresh failure
2	Parity can't be reset
3	First 64K memory failure
4	Timer not operational
5	Processor failure (reserved; not used)
6	8042 GateA20 can't be toggled (memory failure or not present)
7	Exception interrupt error
8	Display memory R/W error
9	(Reserved; not used)
10	CMOS Shutdown register test error
11	Invalid BIOS (such as, POST module not found)

20 (a) How to upgrade BIOS and memory?

BIOS upgradation

- (i) Check the current BIOS version
- (ii) Determine the system's origins.
- (iii) Backup the existing BIOS first! If using BIOS update software executed from Windows or another operating system, backup the existing BIOS image first. Most BIOS updaters have this functionality built-in (e.g., "Save" or "Backup"), and will advise you to perform a backup first.
- (iv) Prepare your system.
- (v) Perform the update. Run the downloaded installer or .exe file for the BIOS updating software.
- (vi) Restart the computer. After the update is completed, many update programs will automatically restart the computer. Some updaters will request your permission to do so while others will warn about this before starting the update
- (vii) Clear existing BIOS settings if recommended. This is not always necessary, depending on what features have changed between the existing version and the updated version.
- (viii) Configure the BIOS with the default settings.

Upgrading the Memory

Follow the steps to upgrade the computer memory

- (i) Open the case
- (ii) Open the latches on either side of the RAM bay. True, some of Asus's new motherboards have openable latches only on *one* side of the RAM bay, but the principle is the same.
- (iii) Push the memory down firmly but carefully until it clicks into place, and the latches on both sides of the RAM bay secure the stick in place.
- (iv) Close up the case
- (v) Boot up the PC. If the PC does not boot up, turn it off and repeat steps 1-6.
- (vi) Right-click on the "My Computer" icon and select Properties from the pop-up menu to verify that the computer recognizes the RAM you've just installed

20 (b) Explain how to configure laptop and power settings.

Configuring laptops and power settings

A laptop is purchased with the ability to be configured with many different settings for security, memory, speed or other options. Follow these steps to configure the laptop for a variety of settings.

Step 1

Configure the laptop for security by making a startup password. Press the power button on laptop, press the "F2" key and hold down "Alt" while pressing "P" to scroll through the pages. Find the page titled "System Security." Use the left and right arrow keys to modify values. Change the primary password to "Enabled," enter a password and push "Esc" to exit and confirm your password.

Step 2

Set and configure the laptop speed. Speed up your laptop by upgrading the RAM. Opt for 1GB RAM, this boost 13 percent of speed and 8 minutes of battery power only may lose.

Step 3

Boost your laptop's speed even more by installing a high-end hard drive. If laptop is upgrade from a 4,200 rpm drive to a 5,400 rpm drive, 18 percent increase in speed can acquire and only a 7 minute decrease in the life of the battery.

Step 4

Opt for a 2.13G Hz Pentium M CPU if laptop is used for multimedia applications. The hard drive should be 60GB and 5,400 rpm. At least 1G of RAM is required.

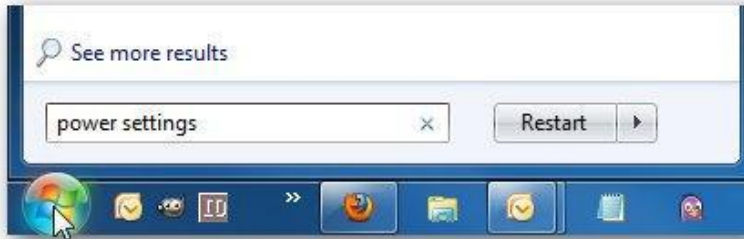
Step 5

Perform a DHCP configuration on Windows XP. Click "Start," "Control Panel", "Network and Internet Connections" and "Network Connections." Select "Local Area Connection," "Change Settings of

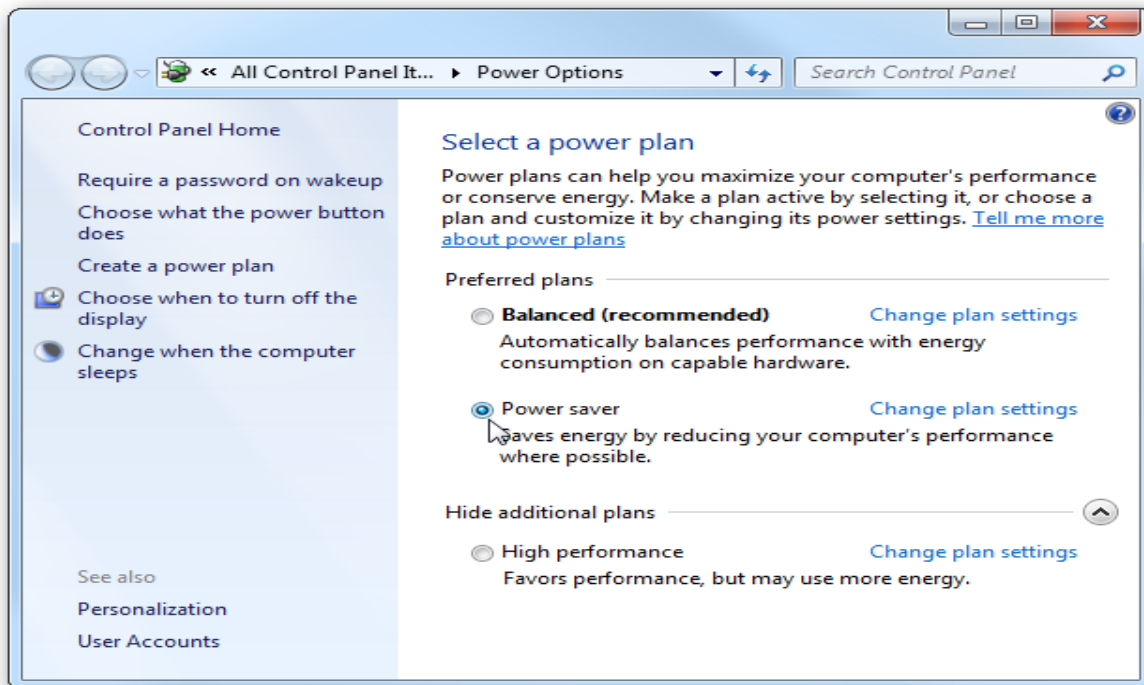
This Connection," "Internet Protocol," "Properties," and then check the boxes for "Obtain an IP Address Automatically" and "Obtain DSN Server Address Automatically." Click "OK" twice.

Configuring Laptop Power Settings:

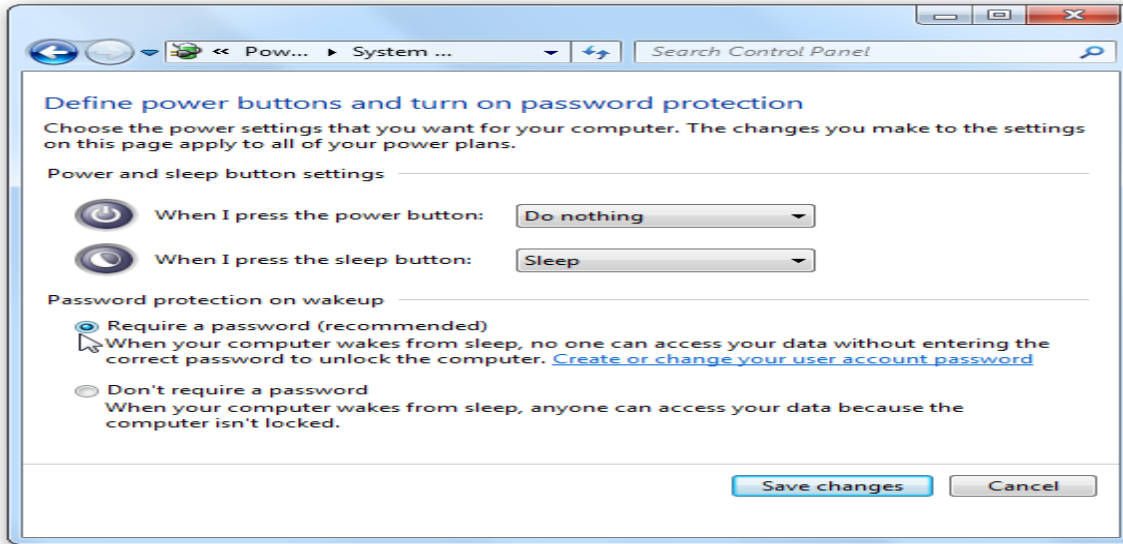
To access power plan options, type power settings into the search bar in the Start Menu and Enter. The Figure shows the power settings.



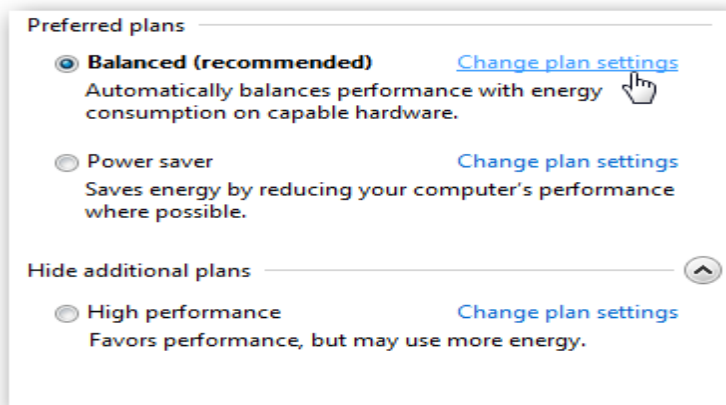
The Power Options screen opens and select from three predefined plans—Balanced, Power saver, or High performance. It is shown in Figure



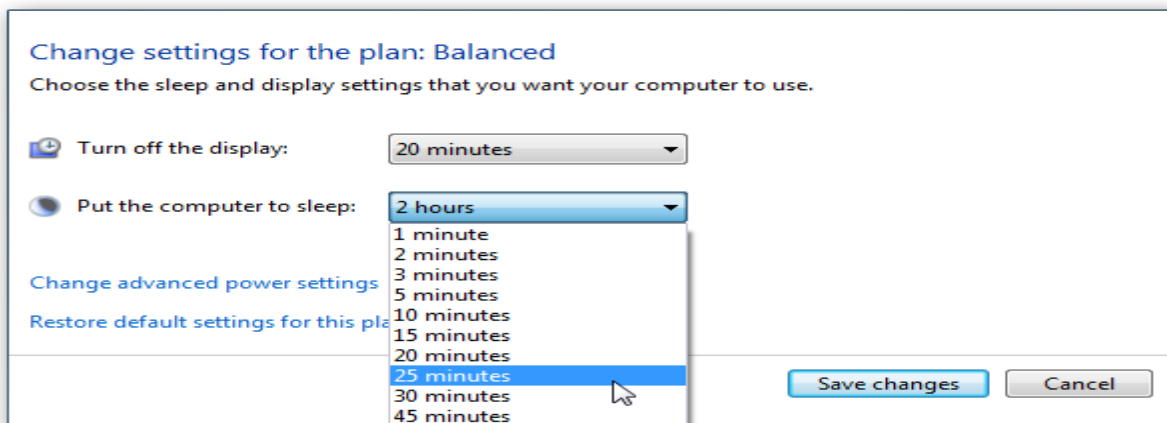
Click on Choose what the power button does and you can tweak several options such as requiring a password on wakeup and what the power button on the computer does. I set "When I press the power button" to Do nothing, you won't have a problem with the PC shutting down when you accidentally hit the power button. It is shown in Figure



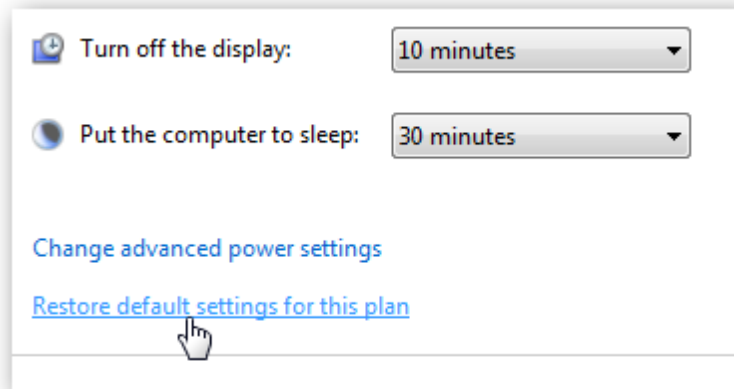
To change any one of the predefined power plans click on Change plan settings. It is shown in Figure



Then change the amount of in active time before the monitor is turned off or the computer goes into Sleep mode. It is shown in Figure

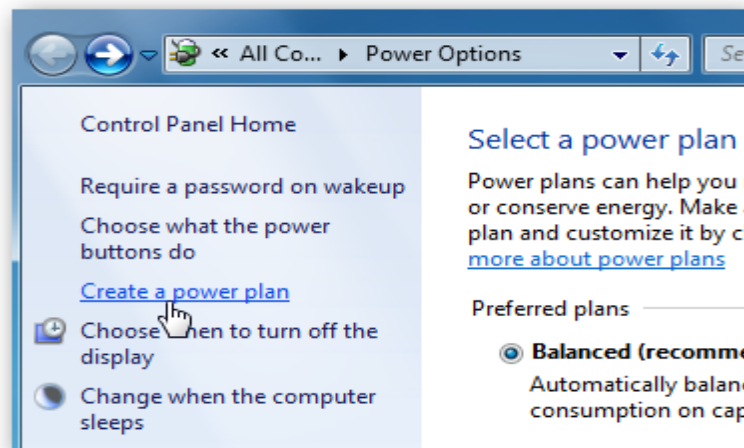


To revert back to the default settings, simply click on Restore default settings for this plan.

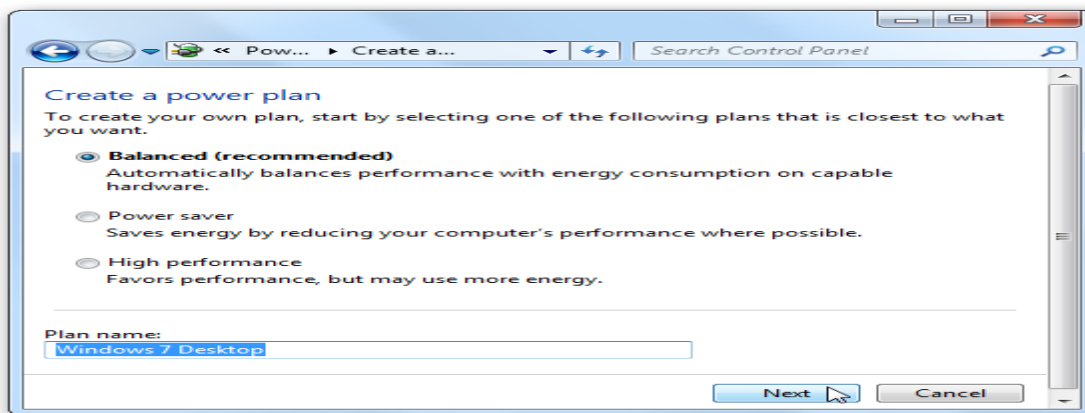


Custom Power Plan

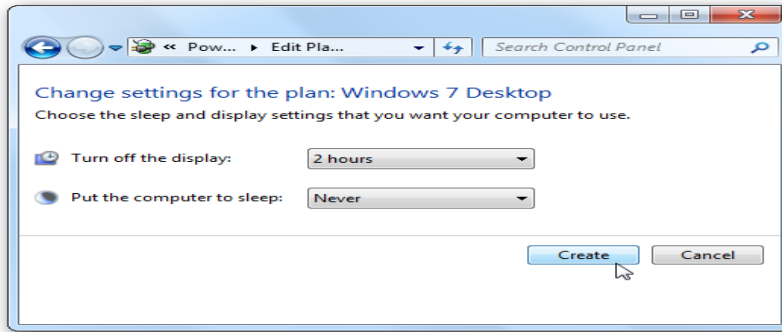
To create a custom plan, click on Create a power plan from the Power Options section. It is shown in Figure



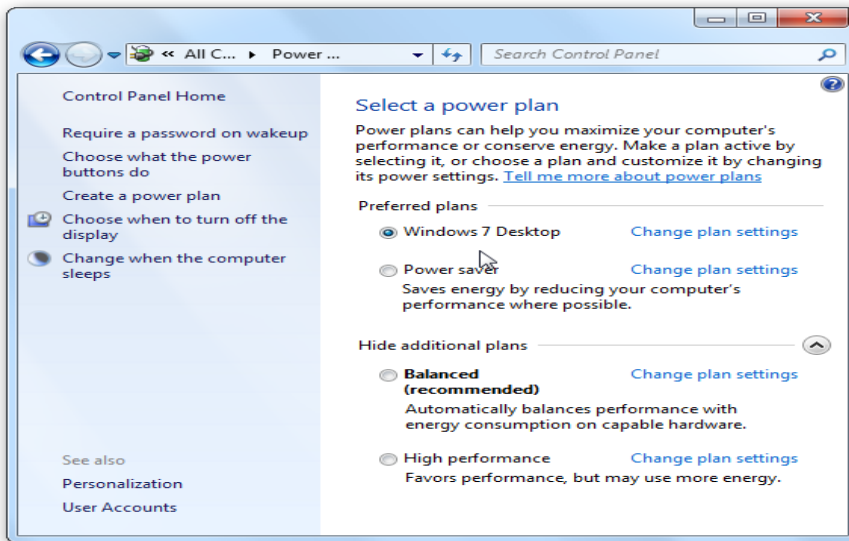
In the Create a power plan window a predetermined plan that is closest to what you want, and give the plan a name. It is shown in Figure



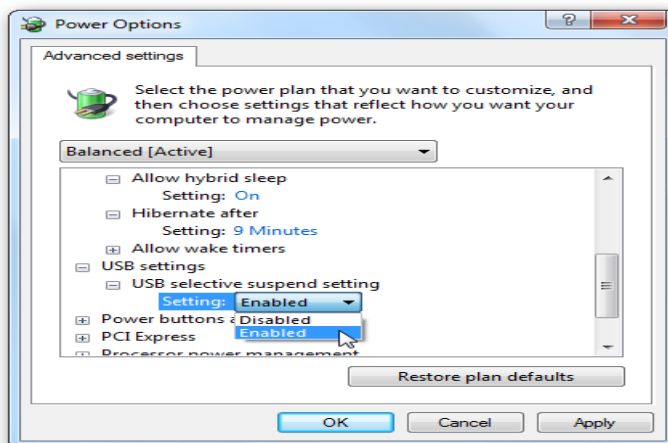
In the next screen as shown in Figure select the sleep and display settings you want to use and click the Create button.



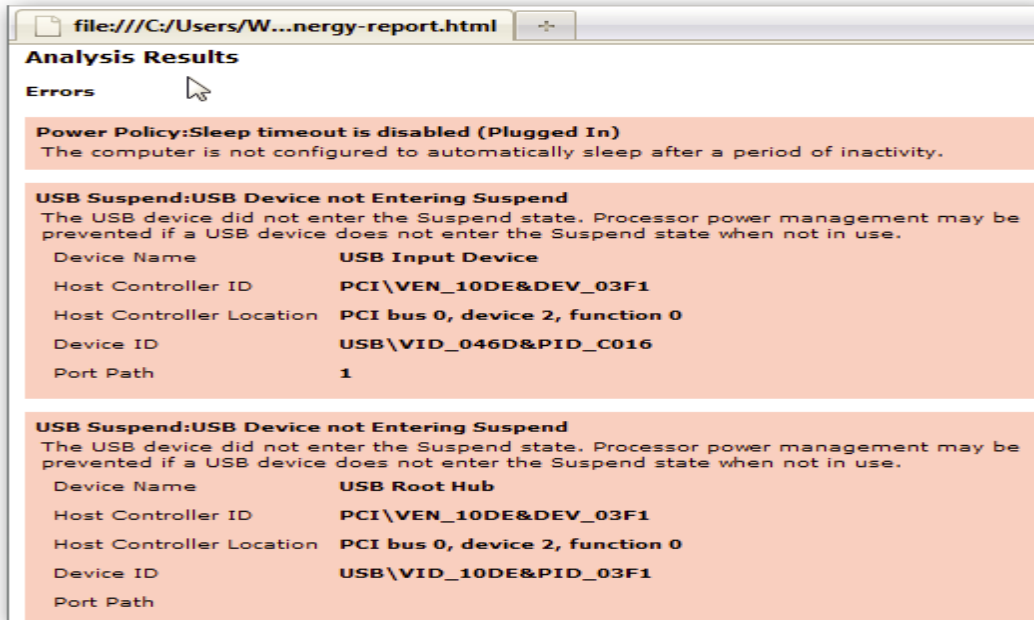
After your plan is created you'll see it under the preferred plans list. It is shown in Figure



Change advanced power settings; it should only be used by advanced users, as if you turnoff the wrong thing, your computer may not function correctly. Choosing between the predetermined settings should be adequate for most users. It is shown in Figure



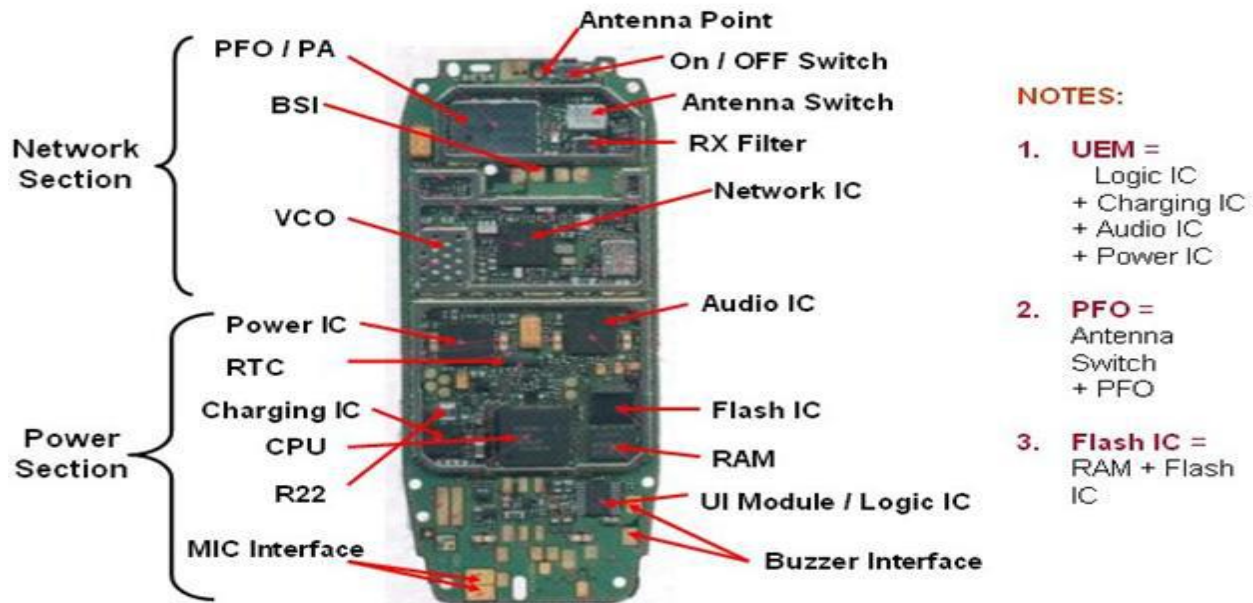
If you are having issues where your laptop is draining too much battery power, or you want to check the overall efficiency of power usage on your computer, Use PowerCfg in Windows7 to Evaluate Power Efficiency. It is shown in Figure



21 (a) Explain briefly about names and functions of IC's used in mobile phone.

There are all kinds of parts and electronic components in a mobile cell phone. These parts and components can be divided into Big Parts and Small Parts. The PCB of a mobile phone is divided into 2 sections namely: Network Section; and Power Section. Figure PCB of a mobile cell phone.

Mobile Phone PCB Diagram



Antenna Switch: It is found in the Network Section of a mobile phone Cell Phone Antenna Switch and is made up of metal and non-metal. In GSM sets it is found in white color and in CDMA sets it is found in golden metal.

Work: It searches network and passes forward after tuning.

Faults: If the Antenna Switch is faulty then there will be no network in the mobile phone.

P.F.O: It is found near the Antenna Switch in the Network Section of the Cell Phone PFO. PCB of Mobile Phone. It is also called P.A (Power Amplifier) and Band Pass Filter

Work: It filters and amplifies network frequency and selects the home network.

Faults: If the PFO is faulty then there will be no network in the mobile phone. If it gets short then the mobile phone will get dead.

RF IC / Hager / Network IC: This electronic component found near Cell Phone Network IC / RFIC the PFO in the Network Section of a Mobile Phone. It is also called RF signal processor.

Work: It works as transmitter and receiver of audio and radio waves according to the instruction from the CPU.

Faults: If the RF IC is faulty then there will be problem with network in the mobile phone. Sometimes the mobile phone can even get dead.

26 MHz Crystal Oscillator: It is found near the PFO in the Network Mobile Phone 26 MHz Crystal Oscillator Section of a Mobile Phone and It is also called Network Crystal. It is made up of metal.

Work: It creates frequency during outgoing calls.

Faults: If this crystal is faulty then there will be no outgoing call and no network in the mobilephone.

VCO: It is found near the Network IC in the Network Section of a Mobile Phone.

Work: It sends time, date and voltage to the RF IC / Hager and the CPU. It also creates frequency after taking command from the CPU.

Faults: If it is faulty then there will be no network in the mobile phone and it will display “CallEnd” or “Call Failed”.

RX Filter: It is found in the Network Section of a Mobile Phone.

Work: It filters frequency during incoming calls.

Faults: If it is faulty then there will network problem during incoming calls.

TX Filter: It is found in the Network Section of a Mobile Phone.

Work: It filters frequency during outgoing calls.

Faults: If it is faulty then there will network problem during outgoing calls.

ROM: It is found in the Power Section of a Mobile Phone.

Work: It loads current operating program in a Mobile Phone.

Faults: If ROM is faulty then there will software problem in the mobile phone and the set will get dead.

RAM: It is found in the Power Section of a Mobile Phone.

Work: It sends and receives commands of the operating program in a mobile phone.

Faults: If RAM is faulty then there will be software problem in the mobile phone and it will get frequently get hanged and the set can even get dead.

Flash IC: It is found in the Power Section of a Mobile Phone. It is also called EEPROM IC,Memory IC, RAM IC and ROM IC.

Work: Software of the mobile phone is installed in the Flash IC.

Faults: If Flash IC is faulty then the mobile phone will not work properly and it can even get dead.

Power IC: It is found in the Power Section of a Mobile Phone. There are Cell Phone Power IC many small components mainly capacitor around this IC. RTC is near the Power IC.

Work: It takes power from the battery and supplies to all other parts of a mobile phone.

Faults: If Power IC is faulty then the set will get dead.

Charging IC: It is found in the Power Section near R22.

Work: It takes current from the charger and charges the battery.

Faults: If Charging IC is faulty then the set will not get charged. If the Charging IC is short then the set will get dead.

RTC (Simple Silicon Crystal): It is Real Time Clock and is found in Mobile Phone RTC (RealTime Clock) the Power Section near Power IC. It is made up of either metal or non-metal. It is of long shape.

Work: It helps to run the date and time in a mobile phone.

Faults: If RTC is faulty then there will be no date or time in the mobile phone and the set can even get dead.

CPU: It is found in the Power Section. It is also called MAD IC, RAP IC and UPP. It is the largest IC on the PCB of a Mobile Phone and it looks different from all other ICs.

Work: It controls all sections of a mobile phone.

Faults: If CPU is faulty then the mobile phone will get dead.

Logic IC / UI IC: It is found in any section of a mobile phone .It has 20pins or legs. It is also called UI IC and Interface IC.

Work: It controls Ringer, Vibrator and LED of a mobile phone.

Faults: If Logic IC / UI IC is faulty then Ringer, Vibrator and LED of mobile phone will not work properly.

Audio IC: It is found in Power Section of a mobile phone. It is also called Cobba IC and Melody IC.

Work: It controls Speaker and Microphone of a mobile phone.

Faults: If Audio IC is faulty then Speaker and Microphone of a mobile phone will not work and the set can even get dead.

21 (b) (i) write short notes on anti-virus software.

Antivirus Software

Antivirus software is a free protection for the Phone Against Virus Attacks, Theft, and Unwanted Numbers.

- (i) Protect your device from unauthorized users.
- (ii) Review apps that might affect your privacy.
- (iii) Easily share Quick Heal Mobile Security app with other Android devices.
- (iv) Protect your lost device with remote lock and data wipe feature.

Scan Device

This flexible feature offers the following functionalities:

- (i) **Quick Scan:** Runs a quick scan on the device based on request.
- (ii) **Custom Scan:** Offers multiple scanning options such as Full Scan, Scan All Apps, Scan Selected Apps, Scan Memory Card and Scan Selected Folders.
- (iii) **Schedule Scan:** This feature allows to schedule a virus scan at a time
- (iv) **Security Advisor:** The Security Advisor guides about settings that can enhance the overall security of your Smartphone. For example, if the 'Screen Lock' setting is enabled on the phone, then the Security Advisor will instruct to enable it.
- (v) **Privacy Advisor:** Privacy Advisor notifies and allows us to do a quick inspection of apps that might affect our privacy. It helps to review the permissions used by such apps, and you can decide whether to keep them or not.
- (vi) **Set Privacy** The Set Privacy feature allows to protect the privacy with the following functionalities:
 - a) **Call & Message Filter:** It easily block incoming calls and SMSs from unknown or unwanted numbers.
 - b) **International Call Block:** This feature allows to block unknown International calls.
 - c) **Message Exception List:** This list displays non-numeric senders that are excluded from SMS blocking.
 - d) **Register With TRAI:** This feature block all types of telemarketing calls by registering the number in the DND (Do Not Disturb) list. It can also raise a complaint with TRAI (Telecom Regulatory Authority of India) against unwanted telemarketing calls and SMSs.
 - (i) **Message Center** Displays important notifications that require your attention. Latest IT security news and alerts are also displayed in the Message Center.
 - (ii) **Activity** Receive extensive reports on the activities performed by Quick Heal Mobile Security on your device.
 - (iii) **Call Forwarding Helps** us to set a number to which all your incoming calls will get forwarded. Set this number by sending an SMS or via the Remote Device Management portal.

(iv) **Background Scan** Assured protection from all kinds of virus and malware threats. Automatically detects virus and spyware in real-time. The Background Scan runs silently without interfering with the normal functionality of your phone.

(v) **Regular Automated Virus Updates** Takes automatic virus definition updates, so that your device is secured from new and emerging threats.

(vi) **Share App** shares Quick Heal Mobile Security application with other Android devices using Bluetooth, Wi-Fi Direct, or NFC.

(vii) **Anti-Theft** Quick Heal's anti-theft technology prevents the device from being misused. It allows to remotely lock the device, erase its data, and track its location if it gets lost or stolen.

(viii) **Quick Settings Notification** Enable this feature to get quick access to device setting options such as Wi-Fi, Bluetooth, Mobile Data, Brightness, and Torch.

(ix) **Remote Device Management** this is a portal provided by Quick Heal, where you can easily manage your device if it gets lost or stolen. Through this portal, remotely lock, unlock, and delete the data on phone is possible. The Remote Device Management portal also helps to track the location of the device.

(x) **Security Shield** The Security Shield displays the security level of the device and data through a graphical representation. By tapping this shield, it can configure the security settings of your device.

(xi) **Personal Security This** new mobile security feature has been introduced keeping safety in mind. In case of emergency, press device's power button 3-5 times. This will activate this feature, and an SOS message with the current location will be sent to the alternate contact numbers set during the time of registration.

(xii) **Intruder detection** If someone enters a wrong password 2 times consecutively (to unlock device's lock screen), this feature will take snapshots using the front and rear camera of the device.

(xiii) **Trusted SIMs List** Add multiple SIM numbers to Trusted SIMs List. This feature is beneficial for users using multiple SIMs. When the SIM is changed, the device is not blocked if its entry is present in the Trusted SIM list. Fifty (50) SIM numbers can be added to this List.

(xiv) **News** Get latest news on mobile protection, security alerts, and other important information related to IT security.

21 (b) (ii) write short notes on mobile viruses.

Mobile Viruses

Mobile Viruses is malicious software that targets mobile phones or wireless-enabled Personal digital assistants (PDA), by causing the collapse of the system and loss or leakage of confidential information. As wireless phones and PDA networks have become more and more common and have grown in complexity, it has become increasingly difficult to ensure their safety and security against electronic attacks in the form of viruses or other malware. Cell phone malware were initially demonstrated by Brazilian software engineer Marcos Velasco. He created a virus that could be used by anyone in order to educate the public of the threat.

The first known mobile virus, "Timofonica", originated in Spain and was identified by antivirus labs in Russia and Finland in June 2000. "Timofonica" sent SMS messages to GSM mobile phones that read (in Spanish) "Information for you: Telefónica is fooling you." These messages were sent through the Internet SMS gate of the Movistar mobile operator. In June 2004, it was discovered that a company called Ojam had engineered an anti-piracy Trojan virus in older versions of its mobile phone game, Mosquito. This virus sent SMS text messages to the company without the user's knowledge. Although this malware was removed from the game's more recent versions, it still exists in older, unlicensed versions, and these may still be distributed on file-sharing networks and free software download web sites. In July 2004, computer hobbyists released a proof-of-concept mobile virus Cabir, that replicates and spreads itself on Bluetooth wireless networks and infects mobile phones running the Symbian OS.

In March 2005, it was reported that a computer worm called Commwarrior-A had been infecting Symbian series 60 mobile phones. This specific worm replicated itself through the phone's Multimedia

Messaging Service (MMS), sending copies of itself to other phone owners listed in the phone user's address book. Although the worm is not considered harmful, experts agree that it heralded a new age of electronic attacks on mobile phones. In August 2010, Kaspersky Lab reported a trojan designated Trojan-SMS, AndroidOS, FakePlayer. This was the first malicious program classified as a Trojan SMS that affects smart phones running on Google's Android operating system, and which had already infected a number of mobile devices, sending SMS messages to premium rate numbers without the owner's knowledge or consent, and accumulating huge bills. Currently, various antivirus software companies like Trend Micro, AVG, avast!, Comodo, Kaspersky Lab, PSafe, and Softwin are working to adapt their programs to the mobile operating systems that are most at risk. Meanwhile, operating system developers try to curb the spread of infections with quality control checks on software and content offered through their digital application distribution platforms, such as Google Player Apple's App Store.

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