BALASORE SCHOOL OF ENGINEERING

COMPUTER SCIENCE AND ENGINEERING

5TH SEMESTER

TH-4

SUB-HARDWARE MAINTENANCE

PREPARED BY-SHUBHASHISH DAS

1.What is the function of SMPS?2017(S-1.A)[2]

Ans:-SMPS stands for Switch-**Mode**-Power-Supply. They are used in many places in a computer. In a modern computer, there is a SMPS that takes rectified AC **input** from the wall, performs power factor correction and then converts the **output** into one or more lower voltage DC outputs.

2.Explain the need for training of staff?[7][2018(1.c)]

Ans:-Due to the rapid growth of educational institutions there is an endemic shortage of good teachers. A big increase in the output of Masters and PhDs, particularly in Computer Science, is required.

 - A large number of faculty positions in the Universities and engineering colleges and even in the IITs are vacant due to the dearth of persons interested in becoming academics. Encouragement in terms of good working conditions and emoluments are needed to attract competent faculty

 - R and D spending of the Indian software services companies is relatively low. To go up the value chain IT companies have to innovate and invest in focused research. The reduction of cost of communication gave birth to the —offshore‖ software development model. The recent emergence of the —Computing Cloud‖ should lead to the next step, namely, providing Software as a Service (SaaS). The rich experience gained in the international market of offering software services should be leveraged to create world class —service products‖ from India on the —Cloud.

-They can recruit experience personnel and thus reap the benefit of that experience or they can re-train existing staff in computer techniques. In doing this, a number of factors used to be considered or the advantages and disadvantages of each option. *(a) Recruitment of Experience Personnel Advantages*

(i) Benefit of the experience.

 (ii) Little or no computer training required.

Disadvantages:

(i) Demand exceeds supply, therefore high salary levels.

(ii) No knowledge of company perhaps even industry.

 (iii) No company loyalties.

(iv) Problem of interaction with existing staff.

(v) Gamble of recruiting an unknown person.

3.Discuss regarding different layout factors and their effect?[2016(3.c)][2018(3.c)]

Ans:-Depending on the type of computer centre, certain factors have to be considered when installing computer system. The factors are: a) **Local Support: It** is important to discover the level of support available locally from different manufactures of hardware. In most cases, the availability of such support would be a major factor in preferring a particular make of machine, even if initial cost are higher.

 b) **Hardware Security:** Physical security around computer centres and laboratories need to bestepped up because of the activities of looters. Security attention should be given to the computer hardwares because of their small sizes; if the physical security is slack valuable and costly component of the system might be lost.

c) **Dust: It** is almost always advisable to provide dust cover on computer equipment when not in use, and in some areas special dust filters may be needed to prevent dust penetrating the casing.

d) **Heat:** Because of the heat been produced by the computer, full air conditioned office is highly imperative. It is advisable to buy portable air condition unit or install cooling fan in micro itself.

e) **Power Supply:** Computers can not function without electricity. Electric generators must be provided at the centre incase of the public power supply failure. In addition, the generator should be supported with power stabilizer and uninterruptible power supply (UPS). Power stabilizer protect the computer the harmful effects of fluctuations while UPS maintain the continuity of power supply in the gap between the switch over public supply to in- house generator or vise – versa.

 f) **Humidity:** An unusually assemble of humidity can also be a problem, leading to corrosion of electric contact; it may be advisable to use non- corrodible plugs and socket or to use a contact less keyboard for example.

h) **Workshop:** Basic maintenance facilities will be needed. It is not necessary to be an electronic engineer to do routine maintenance such as disc head alignment, to change board in the computer, or to run the diagnostics programs which will at least help to locate a fault.

 i) **Communication Facilities:** These facilities must be provided to provide a link between the main computer centre and its terminals.

j) **Space Requirement:** From 400sq. ft. to several hundred thousand sq. ft; length-to-width ratio should be approximately 2:3; no long, narrow rooms.

k) **Floor loading:** should be sufficient, preferably with a sound-absorbent and antistatic covering.

4.Name two major vendors in computer Hardware and SOFTWARE?[2017(3.b)][2018(2.a)]

- Computer Associates
- Hewlett-Packard
- IBM
- Red Hat
- SHARE
- Suse/Novell
- Z-Expo

5.what are different standard of expansion unit? Explain in brief?[2018(5.b)][2019(s)5.b]

Ans:-Computer components send and receive data between different devices by the use of a **bus**. The design and type of the bus therefore has a crucial effect on how well a computer system will operate. If you have a high speed drive and a fast CPU, but a slow bus, data will be held up and the individual components will not operate at the speed they are capable. Manufacturers have developed standard methods for connecting different devices and for the design of bus technology. This has benefited everyone by allowing the purchase of devices from different manufactures and not having to worry that the devices will talk to each other.

- *MHz* – Think of 33 MHz as miles per hour or speed.

- *Mbps* (Mega bytes processed per second, transfer rate) translates how many cars could travel the highway within a time period of one second. A higher Mbps value represents a faster device.

Bit Specification, are the number of lanes on the highway. 16 bit = 16 lanes, 32 = 32 lanes etc. the more lanes, the more traffic that can be accommodated.

- *Voltage references,* like 5V or 3.3V, is similar to miles per gallon with the exception that the lower the voltage, the better the gas mileage.

6.Explain different components inside the system unit?[2016(4.c)][2018(5.c)],2017,2018(S-NEW)6-C][2019(s)5.c]

Ans:-

System processors (also called *central processing units* or *CPUs*).

☐ Motherboards (along with their many constituent devices such as the chipset, system buses and so on).

☐ System memory.

☐ Video cards. (The video card is also part of the video subsystem, but on modern systems so much processing can be "offloaded" from the CPU to the video processor that it can in many ways be considered a core system device.) . The CPU is the component that processes instructions. It receives input from the computer's user, operates applications and the operating system and processes data to provide output. . RAM provides the operating memory for the computer. The more processes a computer needs to run at a single time, the more RAM it needs. Operating processes from RAM is much faster than running them from a disk or hard drive. . A computer's storage permits it to permanently store files and data. The hard drive is a common storage device that varies in capacity.

->Mother Board

- Motherboard connects directly or indirectly to every part of the computer. The motherboard's main job is to hold the computer's microprocessor chip and let everything else connect to it.

- Everything that runs the computer or enhance its performance is either part of the motherboard or pulgs into via a slot or port.

- The motherboard is the computer's main circuit board. It's a thin plate that holds the CPU, memory, connectors for the hard drive and optical drives, as well as various external ports and peripherals.

- A port is connected from inside to expansion cards which are plugged into the motherboard and are connected to other components by cables which are long, flat bands that contain electrical wiring. The ports are controlled through the expansion cards.

->SMPS (Switched Mode Power Supply) [2018(2.b)] short note,2017,[2019(s)(2.b)]

SMPS stands for switched mode power supply. It is an electronic device in which energy conversion and regulation is provided by power semiconductors that are continuously switching with high frequency between "on" and "off" states. An output parameter (usually output voltage) is controlled by varying duty cycle, frequency or a phase shift of these transitions. The SMPS (Switched Mode Power Supply) is different from a traditional power supplies because it can be used for different voltage inputs (from 80V to 300V AC). If the SMPS has an AC input, then its first job is to convert the input to DC.

HDD (Hard disk drive) System Interfaces [2018(4.b)] short note [2019(s)4.b]

• Hard Drives 2 Types: SCSI and IDE

• The primary interface used to connect a HDD to a PC is typically called IDE (Integrated Drive Electronics). IDE refers to the fact that the interface electronics or controller is built into the drive and not a separate board.

• Technically the correct name for the interface is ATA, many persist in using the IDE designation today.

• The primary purpose of the hard disk controller, or interface, is to transmit and recive data to and from the drive.

• ATA is a 16 bit parallel interface, meaning that 16 bits are transmitted simultaneously down the interface.

• ATA is used to connect not only hard disks, but also CD and DVD drives, high-capacity Super Disk floppy drives and tape drives.

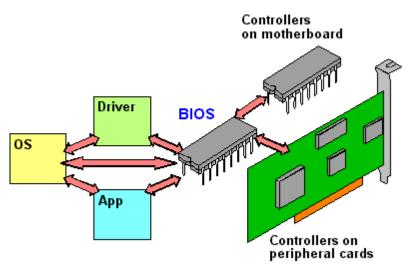**7.What are the types and nature of fault in computer?[2018(6.b)],2016**

Ans:-A fault in a computer system affects the normal operation of the computer, i.e, the computer malfunctions. The symptoms of malfunction are almost unlimited and vary with the nature of the fault. The types of symptoms we often come across are listed below:

- A program has given wrong results.
- A program is looping continuously
- The CPU has lost control
- There is a junk display on the CRT
- The HDD is not working
- Opening more than one window causes the system software to hang

8.Explain Hardware BIOS interaction?

Ans:-A computer's Basic **Input Output** System and Complementary Metal-Oxide Semiconductor together handle a rudimentary and essential process: they set up the computer and boot the operating system. The BIOS's primary function is to handle the system setup process including driver loading and operating system booting.

->The BIOS software has a number of different roles, but its most important role is to **load the operating system**. When you turn on your computer and the microprocessor tries to execute its first instruction, it has to get that instruction from somewhere. It cannot get it from the operatingsystem because the operating system is located on a hard disk, and the microprocessor cannot get to it without some instructions that tell it how. The BIOS provides those **instructions**. Some of the other common tasks that the BIOS performs includes: 1. A power-on self-test (POST) for all of the different hardware components in the system to make sure everything is working properly. 2. Activating other BIOS chips on different cards installed in the computer – e.g. SCSI and graphics cards often have their own BIOS chips. 3. Providing a set of low-level routines that the operating system uses to interface to different hardware devices - it is these routines that give the BIOS its name. They manage things like the keyboard, the screen, and the serial and parallel ports, especially when the computer is booting. 4. Managing a collection of settings for the hard disks, clock, etc.

Controllers on motherboard

Driver

OS

BIOS

App

Controllers on peripheral cards

BIOS Interaction

The **BIOS** (an acronym for **Basic Input/output System** and also known as the **System BIOS**, **ROM BIOS** or **PC BIOS**) is a type of firmware used to perform hardware initialization during the booting process (power-on startup) on IBM PC compatible computers, and to provide runtime services for operating systems and programs. The BIOS firmware is built into personal computers (PCs),

9.Explain Different types of industries and their computer requirements?2018(S)NEW(2.B),2016

Ans:-The computer or information technology, or IT industry is the range of businesses involved in designing computer hardware and computer networking infrastructures, developing computer software, manufacturing computer components, and providing information technology (IT) services. The electronic digital computer is the messenger of the Information Age. Just as technologies developed in earlier ages liberated people from physical toil, computers have liberated people from the more tedious kinds of mental toil—and have revolutionized the transfer of information. The banking, insurance, and travel industries, to name a few, are vastly quicker and more responsive than they were a half-century ago. The computer industry employs hundreds of thousands directly, but many millions of people outside the industry use computers as an important tool in their jobs. Besides the growth of software development companies there were also some new businesses that depended on software and fast worldwide communication which grew rapidly during this period. They were IT enabled services (ITeS) and Business Process Outsourcing (BPO). IT enabled services included tasks such as checking insurance claims, filling income tax returns, medical transcription, remote support on bug fixing ofsoftware, call centres etc. The call centres operate 24 x 7 for worldwide customers and require language proficiency mostly in English and some European languages. Business Process Outsourcing (BPO) is primarily performing the back-office work of a number of organizations, the largest segment being banks and insurance companies. The back-office work was typically accounts receivable, payroll processing, account reconciliation, inventory management, and similar jobs.

10.Which factors affect selection and evolution of computer ?

Ans:-A generic evaluation and selection methodology has been formulated to meet the specific configuration for different levels of industries (i). Identification of possible vendors and manufacturers. (ii). Primary elimination of irrelevant candidates. (iii). Determination of mandatory requirements. (iv). Examination of vendors' compliance with mandatory requirements. (v). Setting quantitative and qualitative criteria and respective weighing scale. (vi)**.** Writing the RFP to be addressed to selected vendors. (vii)**.** Receiving, comparing and analyzing bids. (ix)**.** Concluding final list of vendors. (x). Performance of hardware and software benchmarks. (xi). Drawing final conclusions and selection of best computer family.

11.Explain Firmware concept. Describe the fault elimination process?
[2018[6.b)],2018(3.B)(S)NEW,2016

Ans:-Firmware can be mainly referred to as being a fixed, rather small program that controls hardware in a system. Firmware is generally responsible for every basic low-level operation without which a device would be completely non-functional. Usually firmware is stored in Flash, ROMs, PROMs, and EPROMs. In most cases, firmware is not supposed to be changed by the user. The POST checks, identifies, and initializes system devices such as the CPU, RAM, interrupt and DMA controllers and other parts of the chipset, video display card, keyboard, hard disk drive, optical disc drive and other basic hardware.

->**Fault elimination process Fault** finding is a technique. Some faults can be easily traced out if one proceeds systematically, starting from the symptoms. Some fault show complex symptoms with no clue at all. For such faults

there are no defined starting points. In such case, service engineers should try out an appropriate elimination process. The steps of fault elimination procedure are common to any computer. Some of these can be omitted depending on the symptoms.

(I) Dead System:

A computer is said to be dead when an absolutely essential signal is absent. It is easy to confirm whether a system is dead or alive. The following are some of the symptoms of adead computer: - DC voltage is absent - clk signal is absent - ROM output is inactive - Microprocessor is faulty or dead - The ac fuse is blown (II) Spurious Problems: Sometimes the computer malfunctions randomly. Logical and systematic trouble shooting may not yield any clue. In such case the engineers should look for symptoms of spurious problem. Some of the hidden symptoms of spurious problems are – - DC voltage has excessive ripples - DC voltage is noisy - clk signal is not stable - loose contacts of cables and connectors - there is noise pick up on the next input or on other bus signals. (III) Security Failures: In any computer, sometimes there are abnormal symptoms, due to malfunctioning of special hardware meant for error detection. Three types of problems are caused by such security logic: - When there is no error, the error detection logic (ex. ECC ch..) raises a false alarm. - When there is an error, the security guard without catching it. The error propagates and creates confusion. - The error detection hardware malfunctions in generating appropriate coding. For example, the parity generator may generate a wrong parity bit. This goes unnoticed immediately when the parity checker detects an error, the OS wrongly considers it a genuine error. (IV) Heart Beats: We have seen some of the symptoms of a dead PC earlier. These are the general symptoms applicable to any computer. In addition, there are some check points which are the heart beats of PCs. By sensing these, the engineer can predict the problem type and determine how to proceed with diagnosis.

12.Describe the need of management in computer centre .Explain types of jobs carried out in computers in an organization.?[2018(S-NEW)7-C][2019(s)1.c]

Ans:-The computer centres, one of the support departments in the college, offer a wide range of services to satisfy the general computational and information processing needs of the educational, research and administrative programs. Services Provided by Computer Centres are

- To provide computer-related services to personnel and customers
- To provide advice and consultancy for users
- To provide systems development services to users
- To provide data entry services for users
- To create and maintain IT standards and procedures
- To provide IT acquisition services to users
- To keep and protect IT and data assets
- To ensure that the organization has adequate/advanced IT progress, which is in line with the organization's vision
- To ensure that services provided are meeting with users' requirements

Types of Job Carried Out in Computers in an Organization

- Providing computing capability, running programs and producing reports, printing documents, providing operations services, make sure that good performance is provided
- Providing Internet services: Set up Internet and Email accounts, managing mailbox, providing disks spaces for Web, providing security and virus warning, etc.
- Providing helps: Help users to solve computer usage problems, help users to develop simple applications, help users to keep their data, help on security
- Providing system development services: Develop system for users
- Providing data entry services: This is to capture data into the systems, during these days, such function seems to be obsolete now. Such services may include storing data in database, data protection by data backup and recovery. Scanning images into the systems is also considered as a part of this function.
- Providing consultancy services: Purchasing devices, installing hardware & software, help users to work more efficiently
- Providing training for users, recently, the use of e-Learning concept of training also implemented .

13. Define CMOS set up?[2019(s)5.a]

Ans:-You can enable two types of passwords on many systems: a power-on password that must be entered to allow any use of the system, and a setup password that must be entered to allow access to the BIOS/CMOS setup. If you don't have all the settings recorded (with screen printouts or by writing them down), this can be dangerous to enable.

Installation or setup is the act of making the system or program ready for execution. Because the process varies for each program and each computer, programs (including operating systems) often come with an installer, a specialized program responsible for doing whatever is needed for their installation. *Configuration* is an arrangement of functional units according to their nature, number, and chief characteristics.
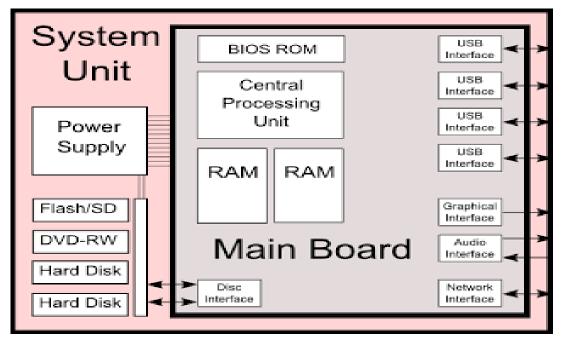
14.Give interpretation of installation and wiring diagram?[2018](S-NEW)(5.B)[2019(s)4.c]

Ans:-**Interpretation of the Installation and Wiring Diagram** The first commercial computer to be installed in India was an IBM 1401 at ESSO Standard Eastern Inc., an oil marketing company in Mumbai. Between 1961 and 1964 twelve computers were installed in Research and Development organizations and two in educational institutions. Now-a-days for installation we required various types of tools. For example **Here is a list of essential tools:**

- Ground bracelet, ground mat, or antistatic gloves to protect against ESD when working inside the computer case
- Flathead screwdriver Phillips-head or crosshead screwdriver
- Torx screwdriver set, particularly size T15
- Tweezers, preferably insulated ones, for picking pieces of paper out of printers or dropped screws out of tight places
- Extractor, a spring-loaded device that looks like a hypodermic needle (When you push down on the top, three wire prongs come out that can be used to pick up a screw that has fallen into a place where hands and fi ngers can't reach.)
- Software, including recovery CD or DVD for any OS you might work on (you might need several, depending on the OSs you support), antivirus software on bootable CDs or USB flash drives, and diagnostic software.

The following tools might not be essential, but they are very convenient:
- Cans of compressed air (see Figure 1-39), small portable compressor, or antistatic vacuum cleaner to clean dust from inside a computer case Cleaning solutions and pads such as contact cleaner, monitor wipes, and cleaning solutions for CDs, DVDs, tapes, and drives
- Multimeter to check cables and the power supply output
- Power supply tester
- Needle-nose pliers for removing jumpers and for holding objects (especially those pesky nuts on cable connectors) in place while you screw them in
- Cable ties to tie cables up and out of the way inside a computer case
- Flashlight to see inside the computer case
- AC outlet ground tester
- Network cable tester
- Loopback plugs to test ports
- Small cups or bags to help keep screws organized as you work
- Antistatic bags (a type of Faraday cage) to store unused parts
- Chip extractor to remove chips (To pry up the chip, a simple screwdriver is usually more effective, however.)
- Pen and paper for taking notes
- POST diagnostic cards

1. Unpack the monitor and computer case from the box. Remove any plastic covering or protective tape. Place the monitor and computer case on a desk or work area. Be sure to place your computer case in an area that is well ventilated and has good air flow. This will help to prevent the computer from overheating.
2. Locate the monitor cable.
3. Connect one end of the cable to the monitor port on the back of the computer case and the other end to the monitor.

15. Discuss systematic way of trouble shooting the principle of WLL and PCS System?[2018(6.c)],[2018(5.C)(S-NEW)][2019(s)06.c]

Ans:-Adhoc techniques of troubleshooting don't always help an engineer. Systematic trouble shooting is a logical approach. It is a scientific and analytical process. The systematic troubleshooting approach can be divided into the following steps: **-** Symptom observation - symptom analysis - fault diagnosis - Fault Rectification (I) Symptom observation The first step in troubleshooting a system or peripheral is observing all the symptoms caused by the fault in the system. For some problems, especially for problems due to multiple faults, it will be impossible to locate the exact fault or it will take a long time & thus the downtime will be increased. The time spent on symptoms observation in turn will yield proportional return during fault locating.

(II) Symptom analysis A careful analysis of the symptoms will give a clue to the fault location process. When there are multiple symptoms the engineers should try to correlate the various symptoms to identify the problem. If any relationship or clue is found, several steps can be skipped during fault location, thereby reducing the downtime considerably.

(III) Fault diagnosis It is highly sophisticated scientific process. The most important point is the multi-dimensional view to be applied by the hardware engineer while troubleshooting. The main dimensions are - *Architecture:* Certain problems can be visualized properly only when you analyze the problem and the behavior of the computer as a system consisting both hardware and software. Software may be either a system software or an application software. It is not necessary that we should be a programmer. But we should know what the programs do, when they start and stop some activities and when they interact with hardware. - *Organization:* Different faults may create the same external symptom. The engineer must distinguish the different faults by a deep analysis of the internal machine status. Every computer has certain unique organizational aspects. Before trouble shooting a computer, the engineer should understand the specific detail of organization of the computer.

Engineering Layout: Certain problems are caused by mere physical layout faults: Faulty cable, loose connection, open wire, track short, etc. To catch these problems, one must thoroughly analyze the physical aspects. The layout documents to a computer are – - Circuit diagram - Board layout diagram - Cable Signals - Connecter signals list - Jumper settings.

16.Name various policy and Installation in India?

Ans:-There was no government policy on computers. As part of the five year plans higher technical education was promoted and five Indian Institutes of Technology and 13 Regional Engineering Colleges, one in each state, were established. The Directorate General of Technical Development and the Department of Defence Supplies controlled the area of computers.

Before a computer is received at the user's premises the data processing manager must give many man- hours of thought to the preliminaries and must draw up detailed plans for the three major phases,

- Pre installation
- Installation and
- Productive running

17. Discuss the basic maintenance concept?

Ans:- Basic maintenance concepts **Computer maintenance** is the practice of keeping computers in a good state of repair. A computer containing accumulated dust and debris may not run properly. Dust and other cruft may accumulate as a result of air cooling. Any filters used to mitigate this need regular service and changes. If the cooling system is not filtered then regular computer cleaning may prevent short circuits and overheating. System maintenance is an umbrella term that encompasses various forms of computer maintenance needed to keep a system running. The two main components of system maintenance are preventive and corrective maintenance. Preventive maintenance involves taking measures to help keep the system functioning, whereas corrective maintenance involves the replacement or repair of a system or its components after they have already failed.

(I) Preventive Maintenance

Preventive maintenance is defined as the proactive maintenance of equipment before a fault or failure occurs. Preventive maintenance involves routine tasks to ensure that your system is running optimally and to avoid problems before they arise. This is similar to routine maintenance performed on a car: In the same way you need to periodically check the oil, lights, engine, and other parts of the car in order for it to run smoothly, the same principle applies to preventive maintenance for a computer. There are several preventative measures you can take, including installing Windows updates, scanning for viruses and malware, and running cleaning programs. Anti-virus and anti-malware scans should be run at least once a week. Be sure to run updates for these programs whenever they're released, as new viruses and malware spring up constantly. Keeping your network secure, installing a firewall, and using safe downloading practices can protect your computer and any information on it from being compromised. Power surges and overheating can destroy electronic equipment, so protect your hardware by investing in a surge protector and cleaning your equipment periodically to remove dust. Should any preventative measures fail, it is always a good idea to have a backup for important files: Invest in an external hard drive to save any important files should your computer need replacing.

(II) Corrective Maintenance

Corrective maintenance, commonly referred to as "repair," is the correction of a problem after the computer has already broken down. The goal of this form of maintenance is to restore operability to the system by either correcting the problem or replacing the damaged components. Common corrective measures involve removing viruses and malware, uninstalling harmful programs, reformatting, and running a system restore, among others. Many common computer problems are easily fixed and don't require an IT professional. To perform corrective maintenance, it is important to first diagnose the problem and figure out the root cause. If you are unsure of the cause or how to fix your problem, consulting an IT professional would be the best course of action.

(III) On-line Maintenance

Remote administration refers to any method of controlling a computer from a remote location. Software that allows remote administration is becoming increasingly common and is often used when it is difficult or impractical to be physically near a system in order to use it. A remote location may refer to a computer in the next room or one on the other side of the world. Unlimited remote support during office hour's.

18.Explain the Need of power condition equipment with their principle of functioning?
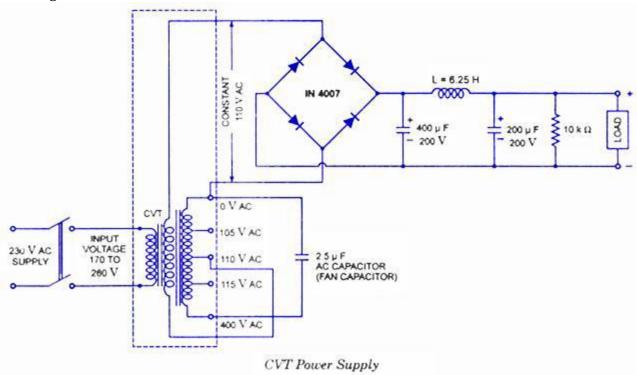
Ans:- A power conditioner (also known as a line conditioner or power line conditioner) is a device intended to improve the quality of the power that is delivered to electrical load equipment. While there is no official definition of a power conditioner, the term most often refers to a device that acts in one or more ways to deliver a voltage of the proper level and characteristics to enable load equipment to function properly. In some uses, power conditioner refers to a voltage regulator with at least one other function to improve power quality (e.g. power factor correction, noise suppression, transient impulse protection, etc.). A good quality power conditioner is designed with internal filter banks to isolate the individual power outlets or receptacles on the power conditioner. This eliminates interference or "cross-talk" between components. Power conditioners vary in function and size, generally according to their use. Some power conditioners provide minimal voltage regulation while others protect against six or more power quality problems.

3.3.1 Constant Voltage Transformer

With the popularization of PCs, the constant voltage transformers (CVTs) have also become equally popular. The CVT is simply a magnetic transformer of a special construction that has a capacitor connected across the secondary winding of the transformer. In an ordinary transformer, the primary and secondary windings are wound near each

other so that whenever there is a change of voltage across the primary there is a corresponding change in the secondary voltage depending upon the ratio of the turns on the two windings. However, in a CVT the primary and secondary windings are wound separately from each other, as illustrated in figure. To set up field in between the coils, a separate shunt path is provided between the two windings but an airgap is formed in the shunt path. A capacitor is connected across suitable tappings of the secondary winding. The constructional details of a CVT are shown in the figure.

change of voltage across the primary there is a corresponding change in the secondary voltage depending upon the ratio of the turns on the two windings. However, in a CVT the primary and secondary windings are wound separately from each other, as illustrated in figure. To set up field in between the coils, a separate shunt path is provided between the two windings but an airgap is formed in the shunt path. A capacitor is connected across suitable tappings of the secondary winding. The constructional details of a CVT are shown in the figure.

CVT Power Supply

Neutral
Some generators do not refer the low side of the output to earth. This MUST be tied down to avoid damage to any of our larger catalogue units which have double primary shields. Care must also be taken that the generator neutral is not connected to the CVT output low.

Frequency
All ferroresonant devices are frequency sensitive. The generator must run close to 50 Hz for the unit to operate correctly.

19.state the steps for assembling of computer?[2018(7.c)]

Ans:- To assemble a computer and boot the system for the first time.; these are some important points to remember: Computer cases come in a variety of sizes and configurations. Many of the computer's components must match the case's form factor.
- The CPU is installed on the motherboard with a heat sink/fan assembly.
- The power supply is installed in the PC.
- RAM is installed in RAM slots found on the motherboard.
- Adapter cards are installed in PCI and PCIe expansion slots found on the motherboard.
- Hard disk drives are installed in 3.5-inch drive bays located inside the case.
- Optical drives are installed in 5.25-inch drive bays that can be accessed from outside the case.
- Floppy drives are installed in 3.5-inch drive bays that can be accessed from outside the case.
- Power supply cables are connected to all drives and the motherboard.
- Internal data cables transfer data to all drives.
- External cables connect peripheral devices to the computer.

20.Describe the steps for actual installation as per the manufacturer's specification procedure?[2019(s)4.c]

Ans:- Steps for actual installation as per the manufacturer's Specified procedure

1. Computerized systems should be validated at the level appropriate for their intended use and in accordance with quality risk management principles. This applies to systems used in all good (anything) practices (GXP) activities (e.g. good clinical practice (GCP), good laboratory practice (GLP) and good manufacturing practices (GMP)

2. The purpose of validation of a computerized system is to ensure an acceptable degree of documented evidence that establishes confidence in the accuracy, reliability and consistency in performance of the system in accordance with predetermined specifications. The validation data should meet the principles of being attributable, legible, contemporaneous, original and accurate (ALCOA) throughout the data life cycle.

3. Computerized system validation should ensure that all necessary technical and procedural controls are implemented ensuring compliance with good documentation practices for electronic data generated by the system (WHO guidance on good data and record management practices, WHO Technical Report Series

4. System elements that need to be considered in computerized system validation include computer hardware and software, related equipment and network components and operating system environment, procedures and systems documentation including user manuals and people (such as, but not limited to, users, data reviewers, system application administrators, network engineers, database administrators and people involved in archiving). Computerized system validation activities should address both system configuration as well as any custom-developed elements.

5. Computerized systems should be maintained in the validated state with risk-based controls appropriate to the different stages of the system life cycle. These stages include system planning, specification, programming and configuration, system testing, preparation and verification of standard operating procedures (SOPs) and training programmers, system operation and maintenance including handling of software and hardware updates, monitoring and review, followed by system retirement.

6. Depending on the types of systems or typical applications such as process control systems (distributed control system (DCS), programmable logic controller (PLC), supervisory control and data acquisition (SCADA)), laboratory information management systems (LIMS), laboratory instrument control systems and business systems (enterprise resource planning (ERP), manufacturing resource planning (MRP II)) used by the manufacturer, a document covering (but not limited to) the following information should be available on-site:

- purpose and scope;
- roles and responsibilities;
- validation approach;
- risk management principles;
- system acceptance criteria;
- vendor selection and assessment;
- computerized system validation steps;
- configuration management and change control procedures;
- back-up and recovery;
- error handling and corrective action;
- contingency planning and disaster recovery;
- maintenance and support;
- system requirement;

21. Write short notes:- FDD

ANS:- A floppy disk drive (FDD), or floppy drive, is a hardware device that reads data storage information. It was invented in 1967 by a team at IBM and was one of the first types of hardware storage that could read/write a portable device. FDDs are used for reading and writing on removable floppy discs. Floppy disks are now outdated, and have been replaced by other storage devices such as USB and network file transfer.

->A FLOPPY DISK COMMONLY CAME IN THREE SIZES, 8 INCHES, 5.5 INCHES AND 3.5 INCHES, BECOMING SMALLER AS THE TECHNOLOGY ADVANCED. THE NEWER, 3.5-INCH VERSION USED MORE CUTTING-EDGE TECHNOLOGY AND HELD MORE DATA THAN PREVIOUS MODELS, WHILE THE ORIGINAL 8-INCH FLOPPY DRIVE WAS DEVELOPED TO

22.DEFINE POST? [2018(6.A)][2019(S)6.A]

Ans:-The Post Sequence (Power-On Self-Test)

Booting process runs a Power-On Self Test (*POST*) to check the devices that the computer will rely on, are functioning. Checks that the basic components are functioning correctly – Motherboard – Power supply – Memory – Video – Keyboard
. Problems are indicated through the system speaker . Consult BIOS/system manual for the meaning of the beep sequences . Example, repeated long beeps indicate memory problems.

23. Define C MOS setup?[2018(5.a)][2018(2.A)(S-NEW)],[2019(s)5.a]

Ans:-CMOS (short for complementary metal-oxide-semiconductor) is the term usually used to describe the small amount of memory on a computer motherboard that stores the BIOS **settings**. Some of these BIOS **settings** include the system time and date as well as hardware **settings.**

24.What is BIOS?[2018(4.a)][2019(s)4.a]

Ans:-BIOS (basic input/output system) is the program a personal **computer's** microprocessor uses to get the **computer** system started after you turn it on. It also manages data flow between the **computer's** operating system and attached devices such as the hard disk, video adapter, keyboard, mouse and printer.

25.State and explain the steps for assembling a computer system.Write the advantages of a assembly computer system?[2019(s)7.c]

Ans:- To assemble a computer and boot the system for the first time.; these are some important points to remember: Computer cases come in a variety of sizes and configurations. Many of the computer's components must match the case's form factor.

- The CPU is installed on the motherboard with a heat sink/fan assembly.

- The power supply is installed in the PC.

- RAM is installed in RAM slots found on the motherboard.

- Adapter cards are installed in PCI and PCIe expansion slots found on the motherboard.

- Hard disk drives are installed in 3.5-inch drive bays located inside the case.

- Optical drives are installed in 5.25-inch drive bays that can be accessed from outside the case.

- Floppy drives are installed in 3.5-inch drive bays that can be accessed from outside the case.

- Power supply cables are connected to all drives and the motherboard.

- Internal data cables transfer data to all drives.

- External cables connect peripheral devices to the computer.

- Beep codes signify when hardware malfunctions.

- The BIOS setup program is used to display information about the computer components and allows the user to change system settings.

26.What do you mean by basic maintenance of a computer systm?Explain the prevention and corrective measures?[2019(s)-7.b]

Ans:- Computer maintenance is the practice of keeping computers in a good state of repair. A computer containing accumulated dust and debris may not run properly. Dust and other cruft may accumulate as a result of air cooling. Any filters used to mitigate this need regular service and changes. If the cooling system is not filtered then regular computer cleaning may prevent short circuits and overheating. System maintenance is an umbrella term that encompasses various forms of computer maintenance needed to keep a system running. The two main components of system maintenance are preventive and corrective maintenance. Preventive maintenance involves taking measures to help keep the system functioning, whereas corrective maintenance involves the replacement or repair of a system or its components after they have already failed.

(I) Preventive Maintenance

Preventive maintenance is defined as the proactive maintenance of equipment before a fault or failure occurs. Preventive maintenance involves routine tasks to ensure that your system is running optimally and to avoid problems

before they arise. This is similar to routine maintenance performed on a car: In the same way you need to periodically check the oil, lights, engine, and other parts of the car in order for it to run smoothly, the same principle applies to preventive maintenance for a computer.

(II) Corrective Maintenance

Corrective maintenance, commonly referred to as "repair," is the correction of a problem after the computer has already broken down. The goal of this form of maintenance is to restore operability to the system by either correcting the problem or replacing the damaged components. Common corrective measures involve removing viruses and malware, uninstalling harmful programs, reformatting, and running a system restore, among others. Many common computer problems are easily fixed and don't require an IT professional.

(III) On-line Maintenance

Remote administration refers to any method of controlling a computer from a remote location. Software that allows remote administration is becoming increasingly common and is often used when it is difficult or impractical to be physically near a system in order to use it. A remote location may refer to a computer in the next room or one on the other side of the world. Unlimited remote support during office hour's .

27. How different industries are classified as per their computer requirements?[2019(s)3.b]

Ans:- The computer or information technology, or IT industry is the range of businesses involved in designing computer hardware and computer networking infrastructures, developing computer software, manufacturing computer components, and providing information technology (IT) services. The electronic digital computer is the messenger of the Information Age. Just as technologies developed in earlier ages liberated people from physical toil, computers have liberated people from the more tedious kinds of mental toil—and have revolutionized the transfer of information. The banking, insurance, and travel industries, to name a few, are vastly quicker and more responsive than they were a half-century ago. The computer industry employs hundreds of thousands directly, but many millions of people outside the industry use computers as an important tool in their jobs. Besides the growth of software development companies there were also some new businesses that depended on software and fast worldwide communication which grew rapidly during this period. They were IT enabled services (ITeS) and Business Process Outsourcing (BPO). IT enabled services included tasks such as checking insurance claims, filling income tax returns, medical transcription, remote support on bug fixing of software, call centres etc. The call centres operate 24 x 7 for worldwide customers and require language proficiency mostly in English and some European languages. Business Process Outsourcing (BPO) is primarily performing the back-office work of a number of organizations, the largest segment being banks and insurance companies. The success of these pioneers induced a large member of Indian companies to start BPO Centres for foreign clients in SEZs as the profit earned at these locations was tax exempt. The cost of starting a BPO was low as the cost of computer hardware as well as that of communication fell rapidly.

28. Write basic components required to set up a computer laboratory?[2019(s)7.a]

Ans:- Site Selection 2. Designing office and rooms 3. Designing the whole centre 4. Detailing the facilities **.** Raised floor: let the wind blow under the floor **.** False ceiling · Air conditioner · Smoke and heat detectors

· Rooms to be designedMachine room · Operator working area · Storage for paper, tapes, disks and

outputs · Customer engineer working area · Technician area · System development areas: for system

analysts and programmers · Library: for storing books, journals and software · Conference and meeting

rooms · Training rooms · Director rooms · Secretary rooms · Operator and guest areas · Toilet