1. Overview, Type of Maintenance

Breakdown Maintenance:
Waiting until equipment fails before repairing or servicing it

Preventive Maintenance (PM):
- (Time-based or run-based) Periodically inspecting, servicing, cleaning, or replacing parts to prevent sudden failure
- (Predictive) On-line monitoring of equipment in order to use important/expensive parts to the limit of their serviceable life

Corrective or Predictive Maintenance:
- Improving equipment and its components so that preventive maintenance can be carried out reliably

2. Scope of Work.

2.1 Duration of Contract
The Vendor would provide comprehensive Onsite Annual Maintenance Contract for a period of ___________ years.

2.2 Scope of Work- Technical Details
The Computer Hardware and Peripherals Maintenance Contract could be fully Comprehensive Onsite Maintenance Contract or could be arranged to be on Time and Material Bases. Maintenance service shall consist of Preventive and Breakdown / Corrective maintenance of all the organizations related IT Hardware Assets and Network Infrastructure. It should take corrective and remedial maintenance services to set right the reported malfunctioning of IT related infrastructure at the specified locations.

The services to be rendered are as follows:

2.2.1 Helpdesk Support Services
Helpdesk will be center point of contact for all user related issues. The maintenance company shall monitor complaints through their web based Application or a suitable Software:
- Call Receiving from Users by telephone, email or any convenient methods including text messages. Logging and issue of complaint:
  - Per User, Per PC, Per office
- Single point of contact for all concerns during the duration of Contact.
Call Escalation, Tracking and Closure

- Following Reports shall be e-mailed to the organizations Co-coordinator as per below frequency: (based on Contract agreement)

**Daily Reports**

- Call Pending Report with details of Complaint No., Location, Date & Time Logged in, No. of Days Pending (from higher to lower), Reasons for delay in resolving
- Calls Resolved on previous day with details of Complaint No., Date & Time Logged in / Resolved, Engineer Name.
- Items sent for Repair/Replacement with relevant details
- Items received for Repair/Replacement with relevant details
- No. of Calls received and No. of Calls resolved

*Note: Depending on the agreement, an online access of the maintenance company Incident logging web page could be granted to the Organization to track and monitor all opened, pending and in-progress incidents. Alternatively an Excel file report could be sent by email to the IT-coordinator.*

**Weekly Reports**

- Pending Complaints beyond specified Time Limits

**Monthly / Quarterly Reports**

- Calls delayed by No. of days beyond specified time limit (Equipment Type wise)
- Analysis of Type of Calls

**2.2.2 Desktop Maintenance**

Under Desktop Maintenance, the maintenance company is required to provide services listed below:

- Maintenance support of the existing Desktops. Maintenance includes repair of components and replacement of un-repairable components. In case of replacement, new (branded & genuine) components shall be used. The organization may ask the servicing company to provide the spares or opt to supply it to the vendor based on the specification provided by the maintenance company.
- Checking status of desktop based on user complaints and taking remedial action in case of problem
- Attending to virus related complaints and taking necessary action to sort out the issues. Guarding the systems against virus infections using the latest anti-virus tools made available by the Organization Installation and Re-load support on Desktop for OS like MS Windows VISTA/Windows 7/ Windows 8/ Linux.
- Download updates/patches by Microsoft and upgrade all computers on the network.
Note: Licensed Antivirus software, for 5, 10 or 50 Desktop computers are available in the Market. It is highly recommended that the organization use licensed antivirus software. The most valued asset of any organization in IT is not the hardware, but the records and data in the forms of softcopy in computers. Using unlicensed software makes the system prone to virus and is very unwise. Once a well known antivirus is installed on all system, It will be the maintenance companies responsibility to follow-up on all updates and clean viruses using the antivirus.

2.2.3 Server Maintenance

- Maintenance support of the existing Servers. Maintenance includes repair of components and replacement of un-repairable components. In case of replacement, the replaced component must be branded and genuine.
- Installation and Re-load support for OS like MS Windows, Linux, etc.

2.2.4 Scanner/Printer Maintenance

- Maintenance Support of the existing Scanner/Printers. Maintenance includes repair of components and replacement of un-repairable components. In case of replacement, the replaced component must be branded and genuine.
- Installation of drivers/ software for its operation

2.2.5 UPS Maintenance

- Maintenance and repair of existing UPS. It includes repair of components and replacement of unrepeatable components. In case of replacement, the replaced component must be branded and genuine.
- Replacement of defective batteries, the new batteries could be made available by the maintenance company based on a quotation presented and the organizations approval.

2.2.6 Network Infrastructure Maintenance

To provide services and support to ensure trouble free availability of network facilities to users:-

- Managing all Patch Panels, switches, cables, etc. in the Network
- Monitoring the network to determine capacity usage and escalating as required
- Identifying LAN faults and getting them resolved
- Installing necessary equipment to connect computers on to the Local Area Network (LAN).
- Repair / Replace faulty LAN cables.

Note: The Vender, or Maintenance Company may supply all the active/passive components like switch, RJ 45 connectors, CAT 5/6 cable, Patch Cord, etc. required for maintenance of network. The
organization cold opt to supply any part from a different vender, however it should be to the standard of the maintenance companies minimum requirement.

Note: A life span of a properly installed infrastructure cabling system is said to be between 5 to 10 years. It might not be necessary to remove entire cabling system and replace it with new for an existing computer setup in a building.

2.2.7 Preventive Maintenance

It will be the responsibility of the Vendor (maintenance company) to keep the computers and system in full working condition. All defects related to virus or operating system or drivers are also included in the scope of work. The preventive maintenance of each PC is to be carried out on quarterly basis. The Vendor is to give the list of preventive maintenance schedules which it intends to do on the Hard disk, PCB boards, socket chips connector, contacts, floppy drive, printer heads and monitor along with the periodicity, procedures etc. for approval.

Some of the maintenance routines covered in Preventive Maintenance is described below:

- a. Regular and thorough cleaning of the system from inside i.e. PCBs etc. by computer grade air and computer grade liquid cleaning solution to remove dirt and dust which hinders the cooling of PCBs during operation. The solution should be free from moisture. Caution should be exercised to prevent the damage due to static charge.
- b. Cleaning and lubrication of all connectors and contacts.
- c. Carrying out the head cleaning of CD-ROM / DVD Drive and floppy disc drive by head cleaning disk and liquid cleaner.
- d. Cleaning and lubricating of the door mechanism of the FDD with lubricant (Silicon based lubricant only) lubricating the grounding strap of the HDD and head slider rails of the printer with the same lubricant.
- e. Cleaning of exterior of PCs, keyboard, mouse, mouse pad, monitor, printer and all other accessories. Good quality cleaning liquid is to be used for such purpose.
- f. Updating of Anti-virus software as provided by the office and keeping PCs virus free. (Every 15 days, and this is very critical)

Note: Computer parts are very sensitive. The type of cleaner to be used must be specifically produced for PC cleaning. An inside of PC could easily get damaged with static Electricity, and is also very dangerous for unqualified technicians to work on due to electric shock. Irrespective of the academic background, it is highly recommended that any computer technician be certified with an industry standard A+ computer technicians certificates.
2.2.8 Comprehensive Liability and Replacement of Parts (Special Agreement)

It is possible to extend the maintenance service to a comprehensive one and make a monthly payment per equipment, rather than a call based payment for a fault or brake on a system.

In this case, the repair/replacements of all spare parts, accessories and software maintenance are included in the package. Such a contract will include repair/replace ment of all defective parts i.e. motherboard, graphics/sound/Ethernet/modem/SCSI/other cards, Hard Disc Drives, CD Drives, Floppy Disk Drives, monitor, keyboard, mouse, hard disk media house, Multi Media Kit etc. and other associated LAN accessories and other spare parts of the computer, printer and accessories. Printer head, Scanner head, CD Writer head etc. are all part of maintenance contract and would have to be replaced if defective during the period of maintenance contract. The only parts that are not part of maintenance contract are consumables like printer ribbons, ink cartridges and paper. The requisite consumables viz. printer cartridges, paper etc will be provided by the user. The hard disk would have to be replaced, if rendered defective by the Vendor.

Maintenance of UPS could also be comprehensive but not inclusive of the batteries.

The supply of specified parts, could be arranged by either parties based on the specifications and quotations supplied by the vendor.

Note: Due to the mass production of some computer parts, it is considered to be cheaper to replace parts than spend several hours on maintenance. It is also known that some parts are more and more integrated and not reparable. In this regard parts such as, keyboard, mouse and monitor are considered consumable and might not worth the time spent to repair.

2.3 Care of Equipment by Vendor

The Vendor shall employ only qualified and trained engineers with adequate field experience. Any damage to the equipment occurred during the maintenance shall be made good by the Vendor at their own expense.

No alterations/attachment/adjustment should be made to the hardware being repaired that can decrease/reduce the actual capability of the machine. All parts replaced by the Vendor must be of same specification and make or, if such parts are not available in the market due obsolescence; parts of different make and quality would be accepted provided such request is made in writing and item is of equivalent or higher quality. Every such replacement/transaction must be informed to the Head of the office in writing and acceptance obtained by the vendor, failing which Head of the office would be fully justified to ask for equivalent or superior quality parts replacements at a later date.

2.4 Hardware Details

The details of Hardware to be maintained are contained in Commercial Offer.
If the organization do not have the list of items, including serial numbers and detailed specification and capacity (Memory capacity, Hard disk capacity, Operating system serial number,...). It is highly recommended that the Maintenance company perform a site survey and register all items before the commencement of the contract. The work done for the registration and database of list of items and the associated fee could be agreed with the organization (It is highly recommended that any organization employ a consultant to record its items and specify the scope of work before going to tender for a maintenance contract).

2.5 Items not covered under Maintenance Contract

- All Consumables items (Ribbon, Cartridges, Toner, Print Head, mouse)
- Physical damage (Body & visible parts)
- Batteries of UPS
- Belt for Printers

2.6 Review Meeting

Monthly review meetings for the first three months with the organizations officials for review of complaints and status and Quarterly Review Meetings thereafter.

2.7 Contract Operation and Downtime Liability

Maintenance will be carried out in normal office working hours Monday to Friday (i.e from 9.00 am – 05.00 pm).

In case the defect is major and cannot be repaired in at the working place, vendor can take the same to their workshop/service center. However, the vendor shall try to provide a proper replacement, so that the office work does not suffer (the number spare a and configured items will be specified in the Contract). All the costs, charges and expenses in respect of transporting the equipment or part thereof shall be vendor's responsibility as the same is deemed to be included in the maintenance contract. Hard disks drives are not to be sent to the vendor’s site for repairs.

2.8 Time limits to attend faults

All calls registered on call basis with organization and Vendor must be attended within time frame as listed below:

<table>
<thead>
<tr>
<th>Severity</th>
<th>Description</th>
<th>Response time</th>
<th>Resolution time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>Servers, Online UPS, Generator</td>
<td>8hrs</td>
<td>48 hrs</td>
</tr>
<tr>
<td>Minor</td>
<td>PC, UPS ETC</td>
<td>8hrs</td>
<td>72hrs</td>
</tr>
<tr>
<td></td>
<td>Printer, scanner, etc</td>
<td>8hrs</td>
<td>72hrs</td>
</tr>
</tbody>
</table>

The resolution time would be considered as the maximum downtime allowed for the IT and related equipment.
**Standby units:**

If any equipment is not repaired within above mentioned timeframe for unavoidable reasons then it is desirable that a stand by unit (with same configuration) is provided by the Vendor to the user or makes alternate arrangements, so that the user’s call is resolved. If the call is resolved, the same shall be certified by the user’s signature in the Call Sheet.

**Equipment to be repaired outside the office premises:**

Any equipment that could not be repaired at the office premises may be transported by the Vendor to their workshop for repairs. The cost of to and from transportation will be borne by the Vendor. The movement of such Equipment shall be governed by organizations Security procedures.

2.9 Post Resolution of Complaints

On resolution of complaint(s), the vendor shall obtain a certificate to that effect in a standard format from the head of the office. A copy of which shall be kept by the head of the office for submission.

*Note: It is assumed the organizations uses a web based Maintenance Management System which is expected to be part of every Computer Maintenance company. The department intends to use it and access may be given to both the Vender and the designated IT coordinate, so that every opened Incident is followed up.*
3. Preventive Maintenance

“...the cost of breakdown maintenance is usually much greater than Preventive maintenance.”

3.1 What is the purpose of preventive maintenance?

Preventive maintenance is a regular and systematic inspection, cleaning, and replacement of worn parts, materials, and systems. Preventive maintenance helps to prevent failure of parts, materials, and systems by ensuring that they are in good working order.

Troubleshooting is a systematic approach to locating the cause of a fault in a computer system. A good preventive maintenance program helps minimize failures. With fewer failures, there is less troubleshooting to do, thus saving an organization time and money. Preventive maintenance can also include upgrading certain hardware or software such as a hard drive that is making noise, upgrading memory that is insufficient, or installing software updates for security or reliability.

Troubleshooting is a learned skill. Not all troubleshooting processes are the same, and technicians tend to refine their troubleshooting skills based on knowledge and personal experience.

3.2 Purpose of Preventive Maintenance

Preventive maintenance reduces the probability of hardware or software problems by systematically and periodically checking hardware and software to ensure proper operation.

3.2.1 Hardware

Check the condition of cables, components, and peripherals. Clean components to reduce the likelihood of overheating. Repair or replace any components that show signs of damage or excessive wear.

Use the following tasks as a guide to create a hardware maintenance program:

- Remove dust from fan intakes.
- Remove dust from the power supply.
- Remove dust from components inside the computer.
- Clean the mouse and keyboard.
- Check and secure loose cables.
3.2.2 Software

Verify that installed software is current. Follow the policies of the organization when installing security updates, operating system updates, and program updates. Many organizations do not allow updates until extensive testing has been completed. This testing is done to confirm that the update will not cause problems with the operating system and software.

Use the tasks listed as a guide to create a software maintenance schedule that fits the needs of your computer equipment:

- Review security updates.
- Review software updates.
- Review driver updates.
- Update virus definition files.
- Scan for viruses and spyware.
- Remove unwanted programs
- Scan hard drives for errors.
- Defragment hard drives.

3.2.3 Benefits

Be proactive in computer equipment maintenance and data protection. By performing regular maintenance routines, you can reduce potential hardware and software problems. Regular maintenance routines reduce computer downtime and repair costs. A preventive maintenance plan is developed based on the needs of the equipment. A computer exposed to a dusty environment, such as a construction site, needs more attention than equipment in an office environment. High-traffic networks, such as a school network, might require additional scanning and removal of malicious software or unwanted files. Document the routine maintenance tasks that must be performed on the computer equipment and the frequency of each task. This list of tasks can then be used to create a maintenance program.

The following are the benefits of preventive maintenance:

- Increases data protection
- Extends the life of the components
- Increases equipment stability
- Reduces repair costs
- Reduces the number of equipment failures