



Gurukul Technicals Institute

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FREE EBOOK

HARDWARE, NETWORKING AND REPAIR

Printers and Scanners

Install, share, maintain and troubleshoot printers and scanners

INSIDE THIS BOOK

- Kinds of printers
- Connecting a printer: USB, network and Wi-Fi
- Installing the driver and printing a test page
- Sharing a printer and printing from phones
- Print queue and offline problems
- ...and 5 more chapters, practice questions and a glossary

Beginner

Hardware students, office staff and shopkeepers with a printer

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Printers and Scanners

Learn how the common kinds of printer work, then install one on Windows, connect it by USB, cable or Wi-Fi and share it with the whole office. You will clear stuck print jobs and paper jams, fix faded or streaky prints, look after ink and toner, scan documents to PDF and follow a simple maintenance plan.

WHO IT IS FOR	Hardware students, office staff and shopkeepers with a printer
LEVEL	Beginner
SUBJECT AREA	Hardware, networking and repair
WHAT IS INSIDE	10 chapters, practice questions with answers, and a glossary

HOW TO USE IT

Read one chapter at a time and try the examples as you go: on a computer, at your workbench or in your notebook. The boxes give tips, safety points and short activities. When you finish, test yourself with the practice questions and check your answers at the end. Words you may not know are explained in the glossary.



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Kinds of printers

A **printer** puts text and pictures from a computer onto paper. Almost every office, school and shop in India has one. Before you can fix a printer, you need to know which kind it is, because each kind fails in its own way.

Inkjet printers

An **inkjet** printer sprays very tiny drops of liquid ink onto the paper. The drops come out of a **print head**, a part with hundreds of holes thinner than a hair. These holes are called **nozzles**. The print head moves left and right on a rail while the paper moves forward.

Inkjets are cheap to buy and print good colour photos. Their weak point is the ink: small cartridges run out fast, and ink can dry inside the nozzles if the printer sits unused for weeks.

Ink tank printers

An **ink tank** printer is an inkjet with large tanks on the side that you fill from bottles. The printer costs more at the start, but a bottle of ink prints many more pages than a cartridge. This is why ink tank printers are now common in homes, schools and small offices.

Laser printers

A **laser** printer does not use liquid ink. It uses **toner**, a very fine dry powder. Inside the printer, a laser draws the page onto a turning cylinder called the **drum**. The toner sticks to the drawn parts, moves onto the paper, and then a hot unit called the **fuser** melts it into the paper.

Laser printers are fast and cheap per page for black-and-white work. Toner does not dry out, so a laser suits an office that prints a lot, or only now and then.

Dot matrix printers

A **dot matrix** printer is an **impact** printer: small metal pins strike an inked ribbon against the paper, just like an old typewriter. It is noisy and slow, but it can print through several sheets at once. That is why some shops, transport offices and banks still use it for bills with carbon copies. Many use **continuous paper**, a long folded strip with holes on both edges.

Thermal printers

A **thermal** printer uses heat instead of ink. The paper has a special coating that turns black where it is heated. Billing counters, petrol pumps and ATMs use thermal printers for receipts, and courier offices use them for labels. There is no ink to buy, but thermal prints can fade over time, especially in heat and sunlight.

Type	Uses	Good points	Weak points
Inkjet	Home, photos	Cheap to buy, good colour	Costly cartridges, ink dries
Ink tank	Home, school, small office	Very low cost per page	Higher price at the start
Laser	Office, heavy printing	Fast, sharp text	Colour lasers are costly
Dot matrix	Bills with carbon copies	Prints several copies at once	Noisy, slow
Thermal	Receipts, labels	No ink, small and fast	Prints can fade

DID YOU KNOW

Scratch a shop receipt hard with your fingernail. A dark line appears, because the heat from rubbing darkens the coating. This is a quick way to tell thermal paper from plain paper.

REMEMBER

The kind of printer decides the fix. "Faded print" means low ink on an inkjet, low toner on a laser and a worn ribbon on a dot matrix.

Connecting a printer: USB, network and Wi-Fi

A printer can talk to a computer in three main ways. Choose the one that suits the place where it will work.

USB

A **USB** cable joins the printer straight to one computer. It is the simplest way and the hardest to get wrong. Most printers use a squarish USB connector called **USB Type-B** at the printer end and the normal flat **USB Type-A** at the computer end. The cable is often not in the box, so check before you go to a customer.

Only the computer joined by the cable can print, unless you share the printer, as the chapter on sharing explains.

Wired network (Ethernet)

Many office printers have a **network port**, also called an **Ethernet port** or **LAN port**. It looks like a wide phone socket. You join it with a network cable to the office **router** or **switch**, the boxes that link the office computers. Now every computer on the network can print, and no computer has to stay on for the others.

Wi-Fi

A Wi-Fi printer joins the office or home Wi-Fi without any cable. Most such printers can be connected in one of these ways:

- **Control panel wizard:** on a printer with a screen, open the Wi-Fi or network settings, choose the network name and type the Wi-Fi password.
- **WPS button:** **WPS** (Wi-Fi Protected Setup) joins devices at the press of a button. Press the WPS button on the router, then the Wi-Fi or WPS button on the printer, within the time the manual allows.
- **Maker's app:** many printers are set up from a phone app made by the printer company.

Many home printers join only the **2.4 GHz** band of a Wi-Fi router, not the 5 GHz band. If the printer cannot see your network, check that the router's 2.4 GHz band is turned on.

Some printers also offer **Wi-Fi Direct**. The printer makes its own small Wi-Fi network, and a phone joins it directly, with no router needed.

Finding the printer's address

A network or Wi-Fi printer gets an **IP address**, a number such as 192.168.1.25 that identifies it on the network. Most printers can print a **network configuration page** that shows this address. Look for it in the printer's menu or in the manual.

EXAMPLE

Priya runs a photocopy shop in Laxmi Nagar with two computers and one laser printer. She joins the printer to her router with a network cable, so either counter can print without carrying files across on a pen drive.

TIP

Place a printer on a firm, level table, away from direct sunlight, dust and the spray of a water cooler. Leave space at the back and sides for air and for opening covers.

SAFETY

Switch off and unplug a printer before you move it or open any cover beyond what the manual asks for. Never open the power supply inside, and never repair the mains cable or plug yourself.

CHAPTER 3

Installing the driver and printing a test page

A computer needs a small program called a **driver** to talk to a printer. The driver turns your document into commands that the exact model understands. A wrong or missing driver is the cause of many "my printer doesn't work" calls.

Let Windows try first

Windows 10 and Windows 11 can often find a printer and install a basic driver by themselves.

1. Switch on the printer and wait until it is ready.
2. Join the USB cable, or make sure the printer is on the same network as the computer.
3. Open **Settings**. In Windows 11 go to **Bluetooth & devices**, then **Printers & scanners**. In Windows 10 go to **Devices**, then **Printers & scanners**.
4. Click **Add device** (Windows 11) or **Add a printer or scanner** (Windows 10).
5. Wait while Windows searches. Click your printer's name when it appears.

Using the maker's driver

The basic driver prints, but it may not show ink levels, scanning or maintenance tools. For the full features, install the driver from the printer maker.

1. Note the exact model name from the front or the label at the back.
2. Open the support or downloads page on the maker's official website and type the model name.
3. Choose your version of Windows (most computers now use 64-bit Windows), then download and run the full driver package.
4. Follow the steps on screen. Many installers say "connect the USB cable now" partway through. Join the cable only when asked.

SAFETY

Download drivers only from the printer maker's own website, or use the disc that came in the box. "Free driver" websites and pop-up offers often carry harmful software.

Printing a test page

A test page proves that the computer, the driver and the printer work together. In **Printers & scanners**, click your printer's name, then click **Print test page** (in Windows 10, click **Manage** first).

If the test page prints, any later problem is likely in the program you print from. If it does not print, the problem is in the connection, the driver or the printer itself.

Choosing the default printer

The **default printer** is the one Windows uses unless you pick another. Windows can choose it for you, using the printer you used last in each place. In an office with one main printer this causes confusion, so turn off **Let Windows manage my default printer** in **Printers & scanners**. Then click the main printer and choose **Set as default**.

EXAMPLE

Mohit installs a new ink tank printer at his father's shop in Kanpur. Windows prints, but he cannot see ink levels or run head cleaning. He installs the maker's full driver package for 64-bit Windows, and the maintenance tools appear.

TRY THIS

On your practice computer, open **Printers & scanners** and list every printer shown. You will probably find some that are not real printers, such as **Microsoft Print to PDF**, which saves any document as a PDF file instead of printing it.

CHAPTER 4

Sharing a printer and printing from phones

Most offices have more computers than printers. **Sharing** lets several people use one printer.

Sharing a USB printer from one computer

A printer joined by USB to one computer can be shared with the others on the same network. The computer with the printer is called the **host**.

1. On the host, set the network as **Private**, meaning a network you trust, such as your office network.

2. Turn on **network discovery** and **file and printer sharing**. In Windows 11 these are in **Settings**, then **Network & internet**, then **Advanced network settings**, then **Advanced sharing settings**. In Windows 10 use **Control Panel**, then **Network and Sharing Center**, then **Change advanced sharing settings**.
3. Open the printer's **Printer properties** and go to the **Sharing** tab.
4. Tick **Share this printer** and give it a short **share name**, such as **OfficeLaser**.
5. On another computer, open File Explorer and type two backslashes and the host's name in the address bar, like **\\RECEPTION-PC**. The shared printer appears. Right-click it and choose **Connect**, and Windows installs it.

The weak point is the host. If the host computer is switched off or asleep, nobody can print.

A network printer for everyone

A printer joined straight to the network by cable or Wi-Fi does not need a host. Each computer adds it with **Add device**. If it does not appear, choose the option that says the printer you want is not listed, then add it by its IP address.

The address must not change, or every computer loses the printer. Ask whoever manages the router to give the printer a fixed address. In router settings this is often called **DHCP reservation** or **address reservation**.

Printing from phones

- **iPhones and iPads** print with a built-in feature called **AirPrint** to printers that support it.
- **Android phones** have a built-in printing option. Open a document or photo, tap the menu or **Share**, and look for **Print**.
- Many printer makers also have their own phone apps, which can scan as well.

The phone must be on the same Wi-Fi network as the printer, or connected through Wi-Fi Direct.

EXAMPLE

Sunita's coaching centre in Patna shares one USB laser printer from the reception computer. Teachers complain that printing often fails. Sunita finds that the reception computer goes to sleep after ten minutes. She changes its sleep setting to **Never**, and the problem stops.

REMEMBER

For a USB printer, sharing depends on the host. For a network printer, everything depends on a fixed IP address.

TRY THIS

In your lab, share a printer from one computer, connect to it from a second computer and print a test page. Then switch off the host and try again. Note the error you see.

CHAPTER 5

Print queue and offline problems

When you click **Print**, the document does not go straight to the printer. Windows first saves it as a **print job** and lines it up in a waiting list called the **print queue**. A Windows service called the **Print Spooler** runs this queue. A **service** is a program that works quietly in the background.

Opening the queue

Open **Printers & scanners**, click the printer and choose **Open print queue**. You will see each job, its owner, its size and its status. Right-click a job to pause, restart or cancel it.

A stuck job

Sometimes one job gets stuck at the top, often after a paper jam or a cable being pulled out, and everything behind it waits. First try the simple fix: right-click the stuck job in the queue, choose **Cancel**, wait a minute, then print again.

If the job refuses to go away, restart the Print Spooler service:

1. Press **Windows key + R**, type `services.msc` and press Enter.
2. Find **Print Spooler** in the list.
3. Right-click it and choose **Stop**.
4. Open File Explorer and go to `C:\Windows\System32\spool\PRINTERS`. Delete the files inside this folder, not the folder itself. Windows may ask for administrator permission.
5. Go back to **Print Spooler**, right-click it and choose **Start**.

You can also stop and start the service by typing two commands in a **Command Prompt** opened as administrator:

```
net stop spooler  
net start spooler
```

REMEMBER

Deleting the files in the spool folder cancels every waiting print job for every user. Tell people first, so they can print again afterwards.

"Printer offline"

Windows shows **Offline** when it cannot reach the printer. Check these in order:

1. Is the printer switched on and showing no error on its screen or lights?
2. For USB: is the cable firmly in at both ends? Try another USB port and another cable.
3. For a network printer: is it still on the network? Print its network configuration page and compare the IP address with the one the computer uses. An address that changed after a power cut is a common cause.
4. Make sure the printer is not paused or set to work offline. In the classic print queue window, these options are **Pause Printing** and **Use Printer Offline** in the **Printer** menu.
5. Restart the printer, then the computer.

Printing the wrong thing, or nothing at all

What you see	Likely cause	What to do
Job goes to another printer	Wrong default printer	Pick the printer in the print box; set the right default
Pages of strange symbols	Wrong driver	Remove the printer, install the correct driver
Job says "Printing" but nothing comes	Printer busy with an error	Check the printer's screen for a jam or empty tray
Job disappears without printing	Printer offline or paused	Check cable or network; resume the printer

EXAMPLE

At a school office in Jaipur, Imran finds 40 jobs waiting behind one stuck job. Cancelling does nothing. He stops the Print Spooler, empties the spool folder, starts the service again, and asks the staff to print their papers once more.

TRY THIS

Pause your lab printer from its print queue window. Send two test pages and watch them wait. Then resume the printer and watch them print in order.

CHAPTER 6

Paper and paper jams

Many printer problems are really paper problems. Good paper, loaded properly, prevents most jams.

Paper sizes and weight

The usual office size in India is **A4**, which is 210 mm × 297 mm. Some offices also use **Legal** size, which is longer. The printer driver and the tray must both be set to the same size, or the printer may stop and ask for paper.

Paper thickness is shown in **GSM**, grams per square metre. Ordinary copy paper is often 70 to 80 GSM. Thicker paper, such as for certificates or cards, may need the manual feed slot or a straighter paper path. The manual lists the weights each printer can take.

Loading paper the right way

1. **Fan** the stack first: hold it by one edge and flick through the other edge so the sheets separate.
2. Tap the stack on the table to square the edges.
3. Put it in the tray without going above the **maximum mark**.
4. Slide the **paper guides** so they just touch the paper without bending it.

TIP

Keep paper in its wrapper in a dry cupboard. Paper that soaks up damp air in the monsoon curls, sticks together and causes many jams. Never reuse paper that is folded, torn or has staples.

Clearing a jam safely

A **paper jam** is a sheet stuck inside the printer.

1. Switch the printer off and unplug it.
2. Open the covers the manual or the screen points to. Many printers show where the jam is.
3. Find the paper and see which way it was travelling.
4. Hold the sheet with both hands and pull it slowly and evenly in the direction the paper normally moves. Pulling backwards can damage the rollers.
5. If it tears, find and remove every small piece. A tiny scrap left behind causes the next jam.
6. Close all covers, plug in, switch on and print a test page.

SAFETY

On a laser printer, the fuser near the paper exit can stay very hot long after printing. Wait until it cools before you reach in, and touch only the parts the manual marks for jam clearing, often coloured green or blue.

When jams keep happening

If a printer jams again and again with good paper, look at the **pickup rollers**. These rubber rollers grab one sheet at a time from the tray. Over time they get dusty or shiny and start slipping. Cleaning them with a lint-free cloth lightly dampened with water often helps. Worn rollers need replacing by a technician.

Other causes are a wrong paper size setting, paper guides set too tight or too loose, or a small object such as a paper clip inside.

EXAMPLE

Neha's printer in her Pune office jams on every tenth sheet. She finds the tray filled above the maximum mark with paper that came straight from a damp shelf. She loads fresh, fanned paper below the mark and the jams stop.

CHAPTER 7

Faded, streaky and blank prints

A bad print tells you a lot, so look at it carefully before you change anything.

Inkjet and ink tank printers

Nozzle check first. Every inkjet can print a **nozzle check** pattern, a set of small lines or blocks in each colour. Start it from the printer's control panel or from the **Maintenance** or **Utility** tab in the driver. The exact name differs between makers.

- If every line is complete, the print head is fine. Look at paper settings and ink levels instead.
- If some lines have gaps, those nozzles are blocked.
- If one colour is missing completely, that colour is empty or badly blocked.

Head cleaning. A **head cleaning** pushes ink through the nozzles to clear dried ink. Run one cleaning, then print another nozzle check. If gaps remain, run one more. If it is still poor, let the printer rest for several hours or overnight, then try again. Cleaning many times in a row rarely helps.

REMEMBER

Every head cleaning uses up ink, and the used ink goes into a pad inside the printer called the **waste ink pad**. When this pad is full, the printer stops and shows an error that needs a service centre. So clean only when the nozzle check shows a problem.

Head alignment. If straight lines look stepped or text looks blurred, run **print head alignment** from the same maintenance menu. The printer prints a pattern and adjusts itself, or asks you to pick the best-looking box.

Paper settings. Glossy photo paper printed on the "plain paper" setting can smudge and look streaky. Always choose the paper type in the print box to match the paper in the tray.

Laser printers

- **Pale print all over:** the toner is low. Take out the cartridge, gently rock it from side to side to spread the powder, and put it back. This gives a few more pages until you replace it. Also check that **toner save** or **draft** mode is off.
- **A white line down every page:** often dirt or toner blocking the light or the toner path. Clean as the manual allows; a new cartridge often cures it.
- **A dark line or repeated marks down the page:** often a scratched or dirty drum.
- **Toner rubs off with your finger:** the fuser is not melting the toner into the paper. This needs a technician.
- **A faint copy of the page repeating lower down,** called **ghosting**: often a drum or fuser problem.

DID YOU KNOW

When a mark repeats at the same distance down the page again and again, the distance often matches the distance round one of the rollers or the drum. Technicians use this measurement to find which part is faulty.

Dot matrix and thermal printers

A dot matrix printer with faint print usually needs a new **ribbon**. A missing line of dots through every letter can mean a broken pin in the print head.

On a thermal printer, a blank receipt usually means the paper roll is in upside down: the coated side must face the print head. Faint thermal prints can mean old paper or a dirty print head.

EXAMPLE

Arjun's ink tank printer in Lucknow prints yellow areas with white stripes. The nozzle check shows gaps in the yellow block only. One head cleaning and a second nozzle check fix it. He does not run five cleanings, which would waste ink and fill the waste ink pad.

TRY THIS

Print a nozzle check on your lab inkjet and stick it in a notebook with the date. Do this every month and you will see when a colour starts to fail.

CHAPTER 8

Ink, cartridges and toner

Ink and toner are the main running cost of a printer. Looking after them saves money and prevents many faults.

Cartridges

An inkjet **cartridge** holds a small amount of ink. Some cartridges carry their own print head, so a new cartridge also brings fresh nozzles.

- Keep a new cartridge sealed in its pack until you need it.
- Remove the protective tape only when the instructions say so.
- Do not touch the small gold or copper contacts or the nozzle area. Oil from your fingers can stop the printer reading the chip or block the nozzles.
- Push the cartridge in until it clicks.

Ink tanks

On an ink tank printer you pour ink from a bottle into the tank of the same colour.

1. Open the tank cover and the tank cap of one colour.

2. Fill slowly to the **upper line**. On many newer models, each bottle's nozzle fits only its own tank, which prevents mixing colours.
3. Close the cap tightly and repeat for the other colours.
4. If the printer asks, confirm the refill on its control panel so that its ink counter resets. The manual explains this step for your model.

Do not keep printing once the ink is below the **lower line**. Makers warn that this can let air into the tubes that carry ink to the head, or damage the head.

SAFETY

Keep ink bottles away from small children and from food. Wipe spills with a tissue at once, and wash ink off your skin with soap and water.

Genuine and compatible supplies

Genuine supplies are made by the printer maker. **Compatible** supplies are made by other companies to fit the same printer. They are often cheaper; some work well, and poor ones can block nozzles. Many makers do not cover damage caused by other inks, so read the warranty card before you decide.

Toner

Laser toner is a very fine powder.

- Do not shake a cartridge hard or open it.
- Do not breathe toner dust. Clean small spills with a dry, lint-free cloth.
- Do not use an ordinary household vacuum cleaner on toner. The fine powder can pass through its filter and spread into the room.
- Wash toner off skin and clothes with **cold** water. Hot water can soften the toner and make it stick.

Some laser printers have a separate **drum unit** and toner cartridge. The drum is sensitive to light, so do not leave it out in bright light or sunlight for long.

Working out the cost per page

The **cost per page** is the price of the ink or toner divided by the number of pages it prints. The pack usually states a **page yield**, worked out with a standard test page that has little printing on it. Pages with more text or pictures use more.

EXAMPLE

These figures are only examples; real prices and yields differ by model. Kavya compares two choices for her shop in Bhopal. A black cartridge costs ₹ 900 and prints about 300 pages: $₹ 900 \div 300 = ₹ 3$ a page. A black ink bottle costs ₹ 600 and prints about 6,000 pages: $₹ 600 \div 6,000 = ₹ 0.10$ a page. For her customers' daily printing, the ink tank printer costs far less to run.

TIP

Print at least a page or two in colour every week on any inkjet or ink tank printer. Ink that sits still in the nozzles for weeks is the main cause of blocked heads.

CHAPTER 9

Scanners and multifunction devices

A **scanner** turns a paper document or photo into a picture file on the computer. Many printers sold today are **multifunction devices**, also called **MFDs** or **all-in-ones**. One machine prints, scans and copies, and some can fax.

Flatbed and document feeder

- A **flatbed** scanner has a glass plate with a lid. You place one page or a book face down on the glass.
- An **ADF**, or **automatic document feeder**, is a tray on top that pulls pages through one by one. It is ideal for scanning a 20-page agreement into one file.

On the glass, line the page up with the corner arrow. For an ADF, the manual shows which way the pages should face.

Installing the scanner

On an MFD, the maker's full driver package usually installs the scanner and a scanning program together. Microsoft also offers a free **Windows Scan** app. If no scanner appears, the full driver is probably missing.

Choosing the settings

Resolution is measured in **DPI**, dots per inch. More dots show more detail but make bigger files.

What you scan	Colour mode	Resolution
Typed letter or form	Black and white or greyscale	200 to 300 DPI
Certificate or ID card	Colour	300 DPI
Photo to keep or reprint	Colour	600 DPI

Colour files are also much larger than greyscale or black-and-white files.

Scanning to PDF

A **PDF** is a file type that looks the same on every computer and phone, which makes it ideal for documents.

1. Place the document on the glass or in the ADF.
2. Open the scanning program and choose **PDF** as the file type.
3. Set the colour mode and resolution.
4. Click **Scan**. For more pages, look for an option such as **Add page** or **Scan more**, so all pages go into one PDF.
5. Click **Save**, give the file a clear name such as Rental - Agreement - Aug . pdf , and choose a folder you will remember.

Some programs can also read the words in a scanned page and turn them into text you can search or copy. This is called **OCR**, optical character recognition.

EXAMPLE

Harpreet runs a cyber café in Amritsar. A customer needs a three-page form as one PDF, smaller than the size limit on a government website. Harpreet scans in greyscale at 200 DPI instead of colour at 600 DPI, and the file becomes small enough to upload.

SAFETY

Customers often scan Aadhaar cards, PAN cards, mark sheets and bank papers. On a shared computer, copy the file to the customer's own pen drive or email it to them, then delete it from the computer and empty the Recycle Bin while they watch.

TRY THIS

Scan the same page three ways: black-and-white at 200 DPI, greyscale at 300 DPI and colour at 600 DPI. Compare the file sizes in File Explorer and the sharpness on screen.

CHAPTER 10

Maintenance schedule and troubleshooting table

Regular care keeps a printer working for years and prevents most service calls.

A simple maintenance schedule

How often	Task
Every day of use	Check paper level; remove printed pages from the tray
Every week	Print at least one colour page on an inkjet; wipe dust off the outside
Every month	Print a nozzle check (inkjet); clean the scanner glass; check ink or toner levels

How often	Task
Every three months	Clean the paper path and pickup rollers as the manual allows; check cables
When needed	Replace toner, drum or ribbon; refill tanks before the lower line

Cleaning the outside and the scanner glass

1. Switch off and unplug the printer.
2. Wipe the outside with a soft, dry cloth. For marks, use a cloth slightly damp with water, never dripping.
3. Clean the scanner glass and the white underside of the lid with a soft cloth. A drop of glass cleaner on the cloth, not on the glass, removes fingerprints.

Dust or a tiny spot of correction fluid on the glass shows up as a line or mark on every scan and copy.

TIP

Keep a small log book beside each printer. Write the date of every refill, toner change, jam and repair. Over a few months it shows which printer costs the most and which part keeps failing.

Troubleshooting table

Start every repair by reading the printer's screen or lights and printing a test page.

Problem	Likely cause	Fix
Printer not found	Cable loose, wrong network, driver missing	Check cable or Wi-Fi; reinstall the driver
Shows "Offline"	Printer off, IP address changed	Restart; check address; untick Use Printer Offline
Jobs stuck in queue	Spooler stuck	Cancel jobs; restart Print Spooler
Paper jams often	Damp or overfilled paper, worn rollers	Fresh fanned paper below the mark; clean rollers

Problem	Likely cause	Fix
Several sheets feed at once	Paper stuck together	Fan the paper; check the paper weight
Gaps in lines (inkjet)	Blocked nozzles	Nozzle check, then one head cleaning
One colour missing	Tank or cartridge empty, or blocked	Refill or replace; clean once
Pale print (laser)	Low toner or toner save on	Rock the cartridge; replace; turn off toner save
Toner rubs off	Fuser fault	Call a technician
Blank receipts (thermal)	Roll upside down	Turn the roll over
Lines on every scan	Dirty scanner glass	Clean the glass
Scanner not found	Scanner driver missing	Install the maker's full package

REMEMBER

Change one thing at a time and test after each change. If you change three things at once and it works, you will not know which one was the real fix.

EXAMPLE

Deepak looks after six printers at a college office in Indore and keeps a log book for each. After six months, the log shows that one old printer has jammed twelve times and needed two new rollers. He shows it to the office head, who decides to replace that printer.

CHECK YOURSELF

Practice questions

1. Name five kinds of printers and one use for each.

2. What is the difference between an inkjet and an ink tank printer?
3. What does the fuser do in a laser printer?
4. A shop receipt comes out completely blank. What is the most likely cause?
5. Why might a home printer fail to find a 5 GHz Wi-Fi network?
6. What is a printer driver, and where should you download one from?
7. Why should you join the USB cable only when the installer asks?
8. What is the Print Spooler?
9. List the steps to clear a print job that will not cancel.
10. A network printer worked yesterday but shows "Offline" today after a power cut. What will you check first?
11. What is the weak point of sharing a USB printer from a host computer?
12. In which direction should you pull jammed paper, and why?
13. Give three causes of frequent paper jams.
14. What is a nozzle check, and what does a gap in a line mean?
15. Why should you not run head cleaning many times in a row?
16. Toner rubs off a laser print when you touch it. What part is faulty?
17. How should you wash toner off your hands?
18. A bottle of ink costs ! 500 and prints about 5,000 pages. What is the cost per page?
19. What DPI and colour mode would you use to scan a typed letter?
20. What should you do with a customer's scanned ID card on a shared computer?

Answers

1. Inkjet for home and photos, ink tank for low-cost school or office printing, laser for heavy office printing, dot matrix for bills with carbon copies, and thermal for receipts and labels.
2. Both spray liquid ink, but an ink tank printer has large tanks refilled from bottles instead of small cartridges, so its cost per page is much lower.
3. It melts the toner powder into the paper with heat, so the print does not rub off.
4. The thermal paper roll is in upside down, with the coated side facing away from the print head.
5. Many home printers can join only the 2.4 GHz band of a router.
6. A driver is a program that lets the computer talk to that exact printer model. Download it from the printer maker's official website or use the disc from the box.
7. Many installers prepare the computer before the printer is joined; joining early can make Windows install a basic driver instead.
8. It is the Windows service that keeps the print queue and sends jobs to the printer one after another.
9. Open services.msc, stop the Print Spooler, delete the files inside C:\Windows\System32\spool\PRINTERS, then start the Print Spooler again.
10. Print the printer's network configuration page and check whether its IP address has changed from the one the computers use.
11. The host computer must be switched on and awake, or nobody else can print.
12. In the direction the paper normally travels, slowly with both hands, because pulling backwards can damage the rollers.
13. Any three of: damp or curled paper, a tray filled above the maximum mark, paper guides set wrongly, worn or dirty pickup rollers, a wrong paper size setting, or an object inside.
14. It is a test pattern of lines in each colour. A gap means some nozzles in the print head are blocked.
15. Each cleaning uses ink and fills the waste ink pad, and many cleanings in a row rarely help more than one or two with rest in between.
16. The fuser, which is not melting the toner into the paper. It needs a technician.

17. With cold water and soap, because hot water can soften the toner and make it stick.
18. ! $500 \div 5,000 = ! 0.10$, or 10 paise, a page.
19. Black and white or greyscale at 200 to 300 DPI.
20. Give the file to the customer on their pen drive or by email, then delete it from the computer and empty the Recycle Bin.

WORD LIST

Glossary

ADF

automatic document feeder, a tray that pulls pages through a scanner one at a time.

Cost per page

the price of the ink or toner divided by the number of pages it prints.

Default printer

the printer Windows uses unless you choose another.

DPI

dots per inch, the measure of how much detail a scan or print has.

Driver

a program that lets the computer control a particular printer or scanner model.

Drum

the turning cylinder in a laser printer onto which the laser draws the page.

Fuser

the hot unit in a laser printer that melts toner into the paper.

GSM

grams per square metre, the measure of how thick and heavy paper is.

Head cleaning

a maintenance task that pushes ink through the nozzles to clear dried ink.

IP address

a number, such as 192.168.1.25, that identifies a device on a network.

Multifunction device

one machine that prints, scans and copies, also called an all-in-one.

Nozzle

one of the very fine holes in an inkjet print head that spray ink.

Nozzle check

a test pattern that shows whether any nozzles are blocked.

OCR

optical character recognition, software that turns the words in a scanned picture into text.

Paper jam

a sheet of paper stuck inside the printer.

Pickup roller

a rubber roller that takes one sheet at a time from the paper tray.

Print queue

the waiting list of print jobs for a printer.

Print Spooler

the Windows service that manages the print queue.

Thermal paper

paper with a coating that turns black when heated.

Toner

the fine dry powder that a laser printer uses instead of ink.

Waste ink pad

a pad inside an inkjet that soaks up ink used during cleaning.

Wi-Fi Direct

a feature that lets a phone connect straight to a printer without a router.



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