

CUET · COMPUTER SCIENCE · CLASS XII · CODE 308

# Societal Impacts

CUET unit: Societal Impacts

By UniDrill · NCERT-grounded study material

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## Snapshot

- Digital technologies reshape every sphere of human life — from banking to e-commerce — and bring ethical, legal, and health responsibilities.
- Digital footprints, netizen behaviour, data protection, intellectual property, and cyber crime are distinct concepts — all tested directly in CUET as definitional or scenario-based MCQs.
- The Indian IT Act 2000 (amended 2008), Creative Commons licensing, and e-waste management are topics NTA regularly frames as statement-matching or "which of the following is correct?" questions.
- Health and ergonomics form the closing section, giving NTA material for application-based questions on safe device use.
- This topic spans awareness, law, and ethics — areas where factual precision distinguishes prepared students from those who merely "know the topic" — so CUET tests it heavily.

## Detailed Notes

### 2.1 Core concepts

- **Digital technologies and society:** From banking to e-commerce, all spheres of human activity now depend on computers and the Internet. Personal computers (PCs), Internet, and smartphones have brought digital technologies to the common person. (NCERT §6.1, p. 167–168)
- **Digital footprint defined:** Whenever we surf the Internet using smartphones, tablets, or computers, we leave a trail of data reflecting our online activities; this trail is our **digital footprint**. It includes websites visited, emails sent, information submitted online, IP address, location, and device-specific details. (NCERT §6.2, p. 168)
- **Active vs. passive digital footprints:** Active digital footprints consist of data intentionally submitted online (emails written, posts on social media). Passive digital footprints are created unintentionally — data generated when we visit a website, use an app, or browse the Internet. (NCERT §6.2, p. 168)
- **Permanence of digital footprints:** Most digital footprints are stored on servers where the hosting applications run; the user may not have access to remove them.

Once a data trail is generated, it effectively remains permanently even if the user attempts to delete it. (NCERT §6.2, p. 169)

- **Netizen / digital citizen:** Anyone who uses digital technology along with the Internet is a digital citizen or **netizen**. Being a good netizen means practising safe, ethical, and legal use of digital technology. (NCERT §6.3, p. 169)
- **Net etiquettes — Be Ethical:** No copyright violation; share expertise only when the information is true, unambiguous, and not already available. (NCERT §6.3.1(A), p. 170)
- **Net etiquettes — Be Respectful:** Respect privacy (do not share others' private images or documents without consent); respect diversity in a group or public forum. (NCERT §6.3.1(B), p. 170)
- **Net etiquettes — Be Responsible:** Avoid cyber bullying (insulting, degrading or intimidating online behaviour); do not feed the troll — the best way to discourage trolls is to ignore them. (NCERT §6.3.1(C), p. 170–171)
- **Communication etiquettes:** Digital communication requires being Precise (respect time, respect data limits), Polite (non-aggressive in both synchronous and asynchronous communication), and Credible (cautious about comments that affect long-term reputation). Avoid spam. (NCERT §6.3.2, p. 171–172)
- **Social media etiquettes:** Be Secure (choose strong passwords, know who you befriend, beware of fake information) and Be Reliable (think before uploading; uploaded files remain on remote servers even after deletion). (NCERT §6.3.3, p. 172–173)
- **Sensitive data:** Elements of data that can cause substantial harm, embarrassment, inconvenience, or unfairness to an individual if breached or compromised. Examples: biometric information, health information, financial information, personal documents, images, audio, or videos. Privacy of sensitive data can be implemented by encryption and authentication. (NCERT §6.4, p. 174)
- **Intellectual Property Rights (IPR):** Intellectual Property refers to inventions, literary and artistic expressions, designs, symbols, names, and logos. It is legally protected through copyrights, patents, and trademarks. (NCERT §6.4.1, p. 174)
- **Copyright:** Grants legal rights to creators for original works (writing, photographs, audio recordings, computer software, etc.). Copyrights are automatically granted. Copyright law gives the holder the right to copy, create derivative works, distribute, and publicly display or perform the work. (NCERT §6.4.1(A), p. 174–175)
- **Patent:** Granted for inventions; the inventor must file for a patent. A patent gives the owner an exclusive right for 20 years to prevent others from using, selling, or distributing the invention. (NCERT §6.4.1(B), p. 175)
- **Trademark:** Any visual symbol, word, name, design, slogan, or label that distinguishes a brand or commercial enterprise from others. (NCERT §6.4.1(C), p. 175)

- **Licensing:** A license is a type of contract or permission agreement between the creator and a user permitting use of the work, generally for some price. Failure to follow a software license agreement is an infringement of IPR and a criminal offence. (NCERT §6.4.2, p. 175–176)
- **Violations of IPR:** (a) Plagiarism — presenting someone else's idea or work as one's own without citing the source; (b) Copyright Infringement — using another's work without permission or without paying if it is being sold; (c) Trademark Infringement — unauthorised use of another's trademark. (NCERT §6.4.3, p. 176–177)
- **FOSS and public access:** Free and Open Source Software (FOSS) allows users to access, modify, correct, and improve source code. Examples: Ubuntu, Fedora (Linux kernel-based OS), Libre Office, Mozilla Firefox. Software piracy is the unauthorised use or distribution of software and is a form of copyright infringement. (NCERT §6.4.4, p. 177–178)
- **Creative Commons (CC):** A non-profit organisation (creativecommons.org) that aims to build a publicly accessible global platform where creative and academic works are shared freely. CC licenses allow owners to grant copyright permissions in a free, simple, and standardised way. There are six types of CC licenses (Table 6.1): CC BY, CC BY-SA, CC BY-ND, CC BY-NC, CC BY-NC-SA, CC BY-NC-ND. (NCERT §6.5, p. 178–179)
- **GNU GPL:** The GNU General Public License (GPL) is primarily designed for software; it grants end users the freedom to run, study, share, and modify the software. It is the most widely used free software license and these rights are preserved in all derivative works. (NCERT §6.4.4, p. 177)
- **Cyber crime defined:** Criminal activities or offences carried out in a digital environment, where either the computer is the target or it is used as a tool to commit the crime. Cyber crimes can target individuals, groups, organisations, or even countries. (NCERT §6.6, p. 179)
- **Hacking:** Unauthorised access to a computer, network, or digital system. Ethical hackers (white hat hackers) test security vulnerabilities with positive intent and report findings. Non-ethical hackers (black hat hackers / crackers) steal data or damage systems for malicious purposes. (NCERT §6.6.1, p. 180)
- **Phishing and Identity Theft:** Phishing uses fake websites or emails that look authentic to fraudulently collect sensitive details (usernames, passwords, credit card numbers). The most common method is email spoofing. Identity theft involves stealing personal data (PAN, Aadhaar, banking credentials) to commit fraud; types include financial, criminal, and medical identity theft. (NCERT §6.6.2, p. 180–181)
- **Ransomware:** The attacker gains access to the victim's computer, blocks access (typically by encrypting data), and demands a ransom payment. Ransomware can arrive via malicious websites, doubtful software repositories, email attachments, or malicious advertisements. (NCERT §6.6.3, p. 181)

- **Combatting cyber crime:** Key safety measures include: regular data backups, updated antivirus software, strong and periodically changed passwords, using only HTTPS sites, avoiding untrusted sites, not sharing passwords, and securing home wireless networks. (NCERT §6.6.4, p. 182)
- **Indian IT Act 2000 (amended 2008):** Provides legal framework for electronic governance, recognises electronic records and digital signatures, outlines cyber crimes and penalties, and establishes the Cyber Appellate Tribunal. Digital signatures are issued by a licensed Certifying Authority (CA) under Section 24. (NCERT §6.7, p. 182–183)
- **E-waste:** Electric or electronic gadgets and devices that are no longer in use. E-waste constitutes more than 5% of municipal solid waste globally. Managed under the Waste Electrical and Electronic Equipment (WEEE) framework. (NCERT §6.8, p. 183)
- **E-waste impact on environment:** Dumped e-waste leaches harmful chemicals into soil and groundwater; dust particles loaded with heavy metals cause air pollution. (NCERT §6.8.1, p. 183–184)
- **E-waste impact on humans:** Lead (monitors, batteries) — kidney, brain, and central nervous system damage; beryllium (circuit boards) — skin disease, lung cancer; mercury (some devices) — respiratory disorders and brain damage; cadmium (semiconductors, resistors) — kidney, liver, and bone damage; plastics — immune system damage, psychological problems. (NCERT §6.8.2, p. 184–185)
- **E-waste management — 3 Rs:** Reduce (purchase only as needed, maintain devices to extend life); Reuse (donate or refurbish functioning equipment — reselling old electronic goods at lower prices is called **refurbishing**); Recycle (convert e-waste into reusable materials; NGOs provide door-to-door collection). (NCERT §6.8.3, p. 185)
- **E-waste law in India:** Environmental Protection Act, 1986 — "Polluter Pays Principle." Central Pollution Control Board (CPCB) guidelines make manufacturers personally responsible for final safe disposal. The Department of IT (DIT) issued guidelines on "Environmental Management for Information Technology Industry in India." (NCERT §6.8.4, p. 185–186)
- **Impact on health and ergonomics:** Prolonged screen use causes eye strain, backaches, neck and shoulder pain, stress, physical fatigue, and obesity. Ergonomics is a branch of science that deals with designing workplaces, furniture, and equipment so they are safe and comfortable. Recommended viewing distance is 19"–24"; seat back angle and knee angle should both be 90°. (NCERT §6.9, p. 186–187)

## 2.2 Definitions to memorise

Term	Definition	Page
Digital footprint	Trail of data reflecting online activities left behind when using the Internet	168

Term	Definition	Page
Active digital footprint	Data intentionally submitted online (emails, social media posts)	168
Passive digital footprint	Data generated unintentionally when visiting websites, using apps, or browsing	168
Netizen / Digital citizen	Anyone who uses digital technology along with the Internet	169
Cyber bullying	Insulting, degrading, or intimidating online behaviour repeatedly targeting someone with intent to hurt or embarrass	170
Internet troll	A person who deliberately sows discord online by posting inflammatory or off-topic messages for amusement	171
Sensitive data	Data whose breach or compromise can cause substantial harm, embarrassment, inconvenience, or unfairness to an individual	174
Intellectual Property	Inventions, literary and artistic expressions, designs, symbols, names, and logos owned by a creator	174
Copyright	Automatic legal right granted to creators for original works; gives rights to reproduce, distribute, and publicly display work	174
Patent	Exclusive right granted for an invention for 20 years, requires filing by the inventor	175
Trademark	Any visual symbol, word, name, design, slogan, or label that distinguishes a brand from others	175
Plagiarism	Presenting someone else's idea or work as one's own without citing the source	176
Copyright infringement	Using another person's work without permission or without paying for it when it is being sold	176
FOSS	Free and Open Source Software — software whose source code is freely accessible for anyone to access, modify, and improve	178
Creative Commons (CC)	Non-profit organisation providing free copyright licenses allowing creators to share works with specific permissions	178
GNU GPL	GNU General Public License — most widely used free software license; grants freedom to run, study, share, and modify software	177
Cyber crime	Criminal activities carried out in a digital environment where the computer is either the target or the tool	179
Hacking	Unauthorised access to a computer, network, or digital system	180
Phishing	Unlawful activity using fake websites or emails to fraudulently collect sensitive personal details	180
Ransomware	Cyber attack where the attacker encrypts victim's data and demands a ransom for access	181

Term	Definition	Page
Malware	Software designed to specifically gain unauthorised access to computer systems	180
E-waste	Discarded electric or electronic gadgets and devices that are no longer in use	183
Refurbishing	Process of re-selling old electronic goods at lower prices after slight modification	185
Ergonomics	Branch of science dealing with designing workplaces, furniture, and equipment to be safe and comfortable for the user	186
Software piracy	Unauthorised use or distribution of software; a form of copyright infringement	178
IT Act 2000 (amended 2008)	India's primary legislation on cyber crime and e-governance	182
Certifying Authority (CA)	Body licensed under Section 24 of IT Act to issue digital signatures	183
Cyber Appellate Tribunal	Tribunal that resolves disputes arising from cyber crimes under the IT Act	183
WEEE	Waste Electrical and Electronic Equipment framework	183
Polluter Pays Principle	Principle under EPA 1986 holding manufacturers responsible for safe disposal	185
3 Rs of E-waste	Reduce, Reuse, Recycle	185
Refurbishing	Reselling old electronic goods at lower prices after minor repair	185
White Hat Hacker	Ethical hacker who tests security flaws with authorisation	180
Cracker / Black Hat Hacker	Non-ethical hacker who exploits flaws illegally	180
Identity Theft	Fraudulent acquisition and use of personal identity for financial/criminal/medical fraud	181
Email Spoofing	Forging email sender address — most common phishing method	180
CC BY-NC-ND	Most restrictive Creative Commons license	179
GNU GPL	Most widely-used free software license	177
Encryption	Method of protecting sensitive data by transforming it into unreadable form	174
Lumbar Support	Lower back support recommended in ergonomic seating	187

## 2.3 Diagrams / processes to remember

- **Figure 6.1 (p. 168):** Exemplar web applications (Facebook, WhatsApp, LinkedIn, YouTube, etc.) that result in digital footprints — illustrates the breadth of passive and active footprint creation.

- **Figure 6.2 (p. 170):** Net etiquettes wheel divided into three segments: Be Ethical (no copyright violation, share expertise), Be Respectful (respect privacy, respect diversity), Be Responsible (avoid cyber bullying, don't feed the troll).
- **Figure 6.3 (p. 171):** Communication etiquettes diagram — five nodes: Be Precise (respect time, respect data limits), Be Polite, Be Credible.
- **Figure 6.4 (p. 173):** Social media etiquettes — two axes: Be Secure (choose password wisely, know who you befriend, beware of fake information) and Be Reliable (think before you upload).
- **Table 6.1 (p. 179):** Six Creative Commons license types with symbolic names (CC BY, CC BY-SA, CC BY-ND, CC BY-NC, CC BY-NC-SA, CC BY-NC-ND) and their descriptions — most restrictive is CC BY-NC-ND.
- **Figure 6.5 (p. 187):** Correct ergonomic posture at a computer — viewing distance 19"–24", seat back angle 90°, knee angle 90°, wrist straight, lumbar support for lower back, feet on floor or footrest.

## 2.4 Common confusions / NTA trap points

- **Active vs. passive footprint confusion:** NTA frequently swaps the definitions. Remember: **active** = intentional submission (you wrote the email); **passive** = automatic/unintentional (the website logged your IP). Students often flip these.
- **Copyright vs. patent:** Copyright is **automatic** (no filing needed) and protects creative/literary works; a patent requires **filing** and protects inventions for 20 years. NTA distractors often say "copyright requires registration" or "patents are automatic."
- **CC BY-ND vs. CC BY-NC-ND:** CC BY-ND allows commercial reuse but no derivatives; CC BY-NC-ND is the most restrictive, allowing only download and sharing with credit, no commercial use, no modification. Students mix up which is "most restrictive."
- **Hacking terminology:** White hat hackers = ethical hackers (help improve security); black hat hackers = crackers (malicious intent). NTA sometimes uses "cracker" as a distractor for a different meaning — in this context it specifically means non-ethical hackers.
- **GPL vs. FOSS vs. freeware:** GPL is open source (source code available, can modify); freeware (e.g., Skype, Adobe Acrobat Reader) allows free use/copying for personal use but prohibits commercial distribution; proprietary software prohibits copying. Students confuse GPL with freeware.
- **E-waste metals (NCERT § 6.8.2, p. 184-185).** Cadmium → kidney/liver/bones; lead → kidney/brain/CNS; mercury → respiratory + brain; beryllium → skin disease + lung cancer.
- **Patent term = 20 years (NCERT § 6.4.1(B), p. 175).** Not lifetime.
- **CC vs GPL (NCERT § 6.4.4 vs § 6.5).** CC for creative works; GPL for software.

- **Software piracy is copyright infringement (NCERT § 6.4.4, p. 178).** Not a separate category.
- **Section 24 of IT Act licenses CAs (NCERT § 6.7, p. 183).** They issue digital signatures.
- **3 Rs order: Reduce > Reuse > Recycle (NCERT § 6.8.3, p. 185).** Reduce is the most preferable.
- **Trolls are best ignored (NCERT § 6.3.1 (C), p. 171).** "Don't feed the troll."

## Practice MCQs

**Q1. Which of the following best describes a passive digital footprint?**

- A.** An email written and sent to a friend describing a personal experience
- B.** A post uploaded on a social media platform by a user
- C.** Data automatically generated when a user visits a website or uses a mobile application
- D.** A comment posted on an online forum by a registered user

**Q2. Consider the following statements about digital footprints: **Statement I:** Digital footprints stored on remote servers can be permanently and completely deleted by the user at any time. **Statement II:** All online activities leave a data trace both on the Internet and on the computing device used. Which of the above statements is/are correct?**

- A.** Only Statement I
- B.** Only Statement II
- C.** Both Statement I and Statement II
- D.** Neither Statement I nor Statement II

**Q3. A school student uses a downloaded video clip from the Internet, edits it by adding the text "Prepared by Rahul", and submits it as his own project work without citing the original source. This act is an example of:**

- A.** Hacking
- B.** Plagiarism
- C.** Trademark infringement
- D.** Ransomware

 **12 more MCQs + answer key**

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## PYQ Alignment

Societal Impact appears with high frequency in CUET Computer Science / Informatics Practices papers, typically contributing 4–6 questions per year; NTA favours scenario-based cyber crime identification (hacking vs. phishing vs. identity theft), CC license matching, and definitions of digital footprint types. Direct definitional recall (IPR forms, e-waste health impacts, IT Act provisions) and "which is NOT correct?" negation questions are the dominant question styles. See [PYQ archive for Computer Science](#).

