GENERAL AWARENESS – BASICS OF COMPUTERS AND COMPUTER APPLICATIONS

Chapter: Basics of Computers and Computer Applications

Subject:	General Awareness – Computers & IT
Total Questions:	70 MCQs
Question Type:	Multiple Choice (Single Correct Answer)
Exam Relevance:	UPSC, SSC CGL/CHSL, IBPS, RRB NTPC, State PSC, NDA, CDS, Bank Exams, Defence Exams
Topics Covered:	Computer Fundamentals, Hardware, Software, Networking, Internet, Cybersecurity, Digital India, AI, IoT, 5G
Based On:	Static GK + Latest Current Affairs 2023–2026 (AI, 5G, DPDP Act, DigiLocker, Quantum Computing)

★ ■ COMPUTER FUNDAMENTALS & HISTORY ★

Q1. Who is considered the 'Father of the Computer'?

A) Alan Turing

B) Charles Babbage

C) John von Neumann

D) Bill Gates

✔ Correct Answer: B) Charles Babbage

■ *Explanation: Charles Babbage (1791–1871) is called the 'Father of the Computer' for designing the first mechanical computer — the Difference Engine (1822) and the Analytical Engine (conceptually complete in 1837). Ada Lovelace, who wrote programs for the Analytical Engine, is called the 'First Programmer'. Alan Turing is called the 'Father of Theoretical Computer Science'.*

Q2. The first generation of computers (1940s–1950s) used which technology?

A) Transistors

B) Integrated Circuits (ICs)

C) Vacuum Tubes (Thermionic Valves)

D) Microprocessors

✔ Correct Answer: C) Vacuum Tubes (Thermionic Valves)

■ *Explanation: Computer generations: 1st Gen (1940s–50s) – Vacuum Tubes (ENIAC, UNIVAC); 2nd Gen (1950s–60s) – Transistors; 3rd Gen (1960s–70s) – Integrated Circuits (ICs); 4th Gen (1970s–present) – Microprocessors (VLSI); 5th Gen (present–future) – Artificial Intelligence, ULSI. ENIAC (1945) was the world's first general-purpose electronic computer.*

Q3. The basic operational cycle of a computer is known as:

A) Boot-Process-Output cycle

B) Input-Process-Output (IPO) cycle

C) Fetch-Execute-Store cycle

D) Read-Write-Execute cycle

✔ Correct Answer: B) Input-Process-Output (IPO) cycle

■ *Explanation: The basic operational cycle of a computer is the IPO (Input-Process-Output) cycle: Input devices (keyboard, mouse) feed data to the CPU → CPU processes it → Output devices (monitor, printer) display/produce results. Storage is sometimes added, making it IPOS (Input-Process-Output-Storage).*

Q4. Which component is considered the 'Brain' of the computer?

A) RAM

B) Hard Disk Drive (HDD)

C) Central Processing Unit (CPU)

D) Motherboard

✔ Correct Answer: C) Central Processing Unit (CPU)

■ *Explanation: The CPU (Central Processing Unit) is called the 'Brain of the Computer'. It consists of: ALU (Arithmetic Logic Unit) — performs calculations and logical operations; Control Unit (CU) — directs operations of the processor; Registers — small fast memory within the CPU. Modern CPUs are microprocessors on a single chip.*

Q5. What does the ALU in a CPU stand for?

A) Automatic Logic Unit

B) Arithmetic and Logical Unit

C) Arithmetic Logic Unit

D) Algorithmic Loop Unit

✔ Correct Answer: C) Arithmetic Logic Unit

■ *Explanation: ALU stands for Arithmetic Logic Unit — the component of the CPU that performs all arithmetic operations (addition, subtraction, multiplication, division) and logical operations (AND, OR, NOT, XOR comparisons). The ALU works with binary data represented as 0s and 1s.*

Q6. The speed of a CPU is measured in:

A) Bytes per second

B) Megabytes (MB)

C) Hertz (Hz) / Gigahertz (GHz)

D) MIPS only

✔ Correct Answer: C) Hertz (Hz) / Gigahertz (GHz)

■ *Explanation: CPU speed (clock speed) is measured in Hertz (Hz) — the number of cycles per second. Modern processors run at Gigahertz (GHz) speeds (1 GHz = 1 billion cycles/sec). A 3.5 GHz processor executes 3.5 billion clock cycles per second. MIPS (Million Instructions Per Second) measures instruction throughput.*

Q7. Which of the following is a secondary storage device?

A) RAM (Random Access Memory)

B) Cache Memory

C) Hard Disk Drive (HDD)

D) CPU Registers

✔ Correct Answer: C) Hard Disk Drive (HDD)

■ *Explanation: Memory hierarchy: Registers (fastest, smallest, in CPU) → Cache Memory (L1/L2/L3) → RAM (Primary/Main Memory – volatile) → HDD/SSD (Secondary Storage – non-volatile, permanent). Hard Disk Drives (HDD) and Solid State Drives (SSD) are secondary storage. USB drives, optical discs (CD/DVD) are also secondary storage.*

Q8. RAM (Random Access Memory) is called volatile memory because:

A) It stores data permanently

B) It is the fastest memory in a computer

C) It loses all data when the computer is switched off

D) It can only be read, not written

✔ Correct Answer: C) It loses all data when the computer is switched off

■ *Explanation: RAM is volatile memory — it requires constant power supply to retain data. When the computer is switched off, all data in RAM is lost. ROM (Read Only Memory) is non-volatile — it retains data without power. HDD/SSD are also non-volatile. RAM is used for temporarily storing data and programs currently in use.*

★ ■ NUMBER SYSTEMS & DATA REPRESENTATION ★

Q9. The binary number system uses which base and which digits?

A) Base 8 – digits 0 to 7

B) Base 16 – digits 0 to F

C) Base 2 – digits 0 and 1

D) Base 10 – digits 0 to 9

✔ Correct Answer: C) Base 2 – digits 0 and 1

■ *Explanation: Binary is Base 2, using only 0 and 1. Number systems: Binary (Base 2), Octal (Base 8, digits 0–7), Decimal (Base 10, digits 0–9), Hexadecimal (Base 16, digits 0–9 and A–F). Computers internally use binary because electronic circuits have two states: ON (1) and OFF (0).*

Q10. What is the decimal equivalent of the binary number 1010?

A) 8

B) 10

C) 12

D) 14

✔ Correct Answer: B) 10

■ *Explanation: Binary 1010 = $1\times2^3 + 0\times2^2 + 1\times2^1 + 0\times2$■ = 8 + 0 + 2 + 0 = 10 (decimal). Binary to decimal conversion: multiply each bit by its positional power of 2 from right. 1010(binary) = 10(decimal) = 12(octal) = A(hexadecimal).*

Q11. 1 Byte = 8 bits. What is 1 Kilobyte (KB)?

A) 1,000 bytes

B) 1,024 bytes (2¹■)

C) 1,200 bytes

D) 512 bytes

✔ Correct Answer: B) 1,024 bytes (2¹■)

■ *Explanation: Data units: 1 Bit (0 or 1) → 4 bits = Nibble → 8 bits = 1 Byte → 1,024 bytes = 1 Kilobyte (KB) → 1,024 KB = 1 Megabyte (MB) → 1,024 MB = 1 Gigabyte (GB) → 1,024 GB = 1 Terabyte (TB) → 1,024 TB = 1 Petabyte (PB). In decimal SI units, 1 KB = 1,000 bytes.*

Q12. ASCII stands for American Standard Code for Information Interchange. It was designed to represent:

A) Images and multimedia

B) Characters (text) as numbers for computers

C) Binary arithmetic operations

D) Network communication protocols

✔ Correct Answer: B) Characters (text) as numbers for computers

■ *Explanation: ASCII is a character encoding standard that assigns a number (0–127) to each character — letters (A=65, a=97), digits (0=48), punctuation, and control characters. Extended ASCII uses 256 values (0–255). Unicode (UTF-8, UTF-16) is the modern standard supporting all world languages, including Hindi and other scripts.*

★ ■■ INPUT/OUTPUT DEVICES ★

Q13. Which of the following is both an input AND output device?

A) Keyboard

B) Printer

C) Touch Screen

D) Scanner

✔ Correct Answer: C) Touch Screen

■ *Explanation: A Touch Screen is both an input device (registers touch/gestures from the user) and an output device (displays information). Other dual-purpose devices include: Modem (sends and receives data), Headset with microphone, Fax Machine. Keyboard and Scanner are input only; Printer and Monitor are output only.*

Q14. OCR (Optical Character Recognition) is a technology that:

A) Scans fingerprints for authentication

B) Converts handwritten or printed text in images into editable digital text

C) Reads barcodes at checkout counters

D) Encrypts data for secure transmission

✔ Correct Answer: B) Converts handwritten or printed text in images into editable digital text

■ *Explanation: OCR (Optical Character Recognition) is technology that converts scanned images of handwritten or printed text into machine-readable text (editable digital format). It is used in digitising old documents, passport readers, cheque processing (MICR is bank-specific), and automated data entry. Google Lens uses OCR technology.*

Q15. A QR Code (Quick Response Code) is which type of barcode that stores information?

A) One-dimensional (1D) linear barcode

B) Two-dimensional (2D) matrix barcode

C) Three-dimensional (3D) holographic barcode

D) Radio-frequency barcode

✔ Correct Answer: B) Two-dimensional (2D) matrix barcode

■ *Explanation: A QR Code is a 2D (two-dimensional) matrix barcode that can store much more information than a 1D barcode. It was invented by Denso Wave (Japan) in 1994. QR codes store URLs, text, contact information, or payment details and can be scanned by smartphone cameras. They are widely used in India's UPI payment system and COVID vaccination certificates.*

★ ■■ SOFTWARE & OPERATING SYSTEMS ★

Q16. What is an Operating System (OS)?

A) A word processing application

B) System software that manages hardware resources and provides services for application software

C) An antivirus program

D) A programming language

✔ Correct Answer: B) System software that manages hardware resources and provides services for application software

■ *Explanation: An Operating System (OS) is system software that acts as an interface between hardware and user/applications. Functions: process management, memory management, file system management, device management, and security. Examples: Windows (Microsoft), macOS (Apple), Linux (open-source), Android (mobile), iOS (Apple mobile).*

Q17. Which operating system is open-source and freely available?

A) Windows 11

B) macOS Sonoma

C) Linux (Ubuntu, Fedora, etc.)

D) iOS 17

✔ Correct Answer: C) Linux (Ubuntu, Fedora, etc.)

■ *Explanation: Linux is an open-source operating system (based on Unix) — its source code is freely available for anyone to view, modify, and distribute under the GNU General Public License (GPL). Created by Linus Torvalds in 1991. Popular Linux distributions: Ubuntu, Fedora, Debian, CentOS, Kali Linux. Android is based on the Linux kernel.*

Q18. GUI stands for Graphical User Interface. It was first commercially popularised by which computer company?

A) IBM

B) Microsoft

C) Apple (Macintosh 1984)

D) Google

✔ Correct Answer: C) Apple (Macintosh 1984)

■ *Explanation: The GUI was pioneered at Xerox PARC but first commercially popularised by Apple's Macintosh (1984) — featuring icons, windows, menus, and a mouse. Microsoft later introduced Windows (1985). GUI replaced the CLI (Command Line Interface) like MS-DOS, making computers accessible to non-technical users.*

Q19. What is a compiler in programming?

A) A device that stores compiled programs

B) A program that translates the entire high-level language source code into machine code at once

C) A program that executes code line by line

D) An error-detection tool for hardware

✔ Correct Answer: B) A program that translates the entire high-level language source code into machine code at once

■ *Explanation: A Compiler translates the entire high-level language program into machine code (executable) at once before execution. An Interpreter translates and executes code line by line (Python, JavaScript use interpreters). An Assembler translates assembly language to machine code. Java uses both: compiler (to bytecode) + JVM interpreter.*

Q20. Which of the following is NOT a programming language?

A) Python

B) Java

C) HTML

D) C++

✔ Correct Answer: C) HTML

■ *Explanation: HTML (HyperText Markup Language) is a markup language used to structure web pages — it is NOT a programming language (it cannot perform logical operations or computations). Programming languages include Python, Java, C, C++, JavaScript, R, and Swift. HTML works alongside CSS (styling) and JavaScript (programming) to build websites.*

★ ■ NETWORKING & INTERNET ★

Q21. What does LAN stand for, and what is its typical geographical coverage?

A) Large Area Network – covering an entire country

B) Local Area Network – small geographical area like a building or campus

C) Linear Access Network – single floor of a building

D) Long Access Network – city-wide coverage

✔ Correct Answer: B) Local Area Network – small geographical area like a building or campus

■ *Explanation: LAN (Local Area Network) covers a small area like a home, office, school, or campus. WAN (Wide Area Network) covers large areas across cities/countries — the Internet is the largest WAN. MAN (Metropolitan Area Network) covers a city. PAN (Personal Area Network) is device-to-device (Bluetooth). VPN (Virtual Private Network) creates a secure private network over the internet.*

Q22. The IP (Internet Protocol) address is a unique identifier for devices on a network. IPv4 addresses consist of:

A) 32-bit addresses (e.g., 192.168.1.1)

B) 64-bit addresses

C) 128-bit addresses

D) 48-bit addresses (like MAC addresses)

✔ Correct Answer: A) 32-bit addresses (e.g., 192.168.1.1)

■ *Explanation: IPv4 uses 32-bit addresses, written as four decimal numbers separated by dots (e.g., 192.168.0.1), supporting ~4.3 billion unique addresses. IPv6 uses 128-bit addresses (written in hexadecimal), supporting 340 undecillion addresses — developed because IPv4 addresses are nearly exhausted. India is transitioning to IPv6.*

Q23. DNS (Domain Name System) is called the 'Phone Book of the Internet'. Its function is to:

A) Block malicious websites

B) Translate human-readable domain names into IP addresses

C) Compress data for faster transfer

D) Encrypt internet connections

✔ Correct Answer: B) Translate human-readable domain names into IP addresses

■ *Explanation: DNS (Domain Name System) translates domain names (e.g., www.google.com) into IP addresses (e.g., 142.250.80.46) that computers use to identify each other on the network. Without DNS, users would have to memorise numeric IP addresses. DNS was developed by Paul Mockapetris in 1983.*

Q24. HTTP and HTTPS are protocols used for web browsing. What does the 'S' in HTTPS stand for?

A) Simple

B) Secured/Secure (uses SSL/TLS encryption)

C) Standard

D) Switched

✔ Correct Answer: B) Secured/Secure (uses SSL/TLS encryption)

■ *Explanation: HTTPS (HyperText Transfer Protocol Secure) adds SSL/TLS (Secure Sockets Layer/Transport Layer Security) encryption to HTTP, encrypting all data exchanged between the browser and server. The padlock icon in browsers indicates HTTPS. HTTP uses port 80; HTTPS uses port 443. All banking, e-commerce, and government websites should use HTTPS.*

Q25. What is a Firewall in computer networking?

A) Hardware that prevents computer overheating

B) A security system that monitors and controls incoming/outgoing network traffic based on security rules

C) An antivirus program that scans files

D) A backup system for data recovery

✔ Correct Answer: B) A security system that monitors and controls incoming/outgoing network traffic based on security rules

■ *Explanation: A Firewall is a network security device (hardware, software, or both) that monitors and filters network traffic based on predefined security rules — allowing legitimate traffic and blocking unauthorised or suspicious traffic. It creates a barrier between a trusted internal network and untrusted external networks (internet).*

Q26. Wi-Fi technology is based on which IEEE standard?

A) IEEE 802.3 (Ethernet)

B) IEEE 802.11 (Wi-Fi)

C) IEEE 802.15 (Bluetooth)

D) IEEE 802.16 (WiMAX)

✔ Correct Answer: B) IEEE 802.11 (Wi-Fi)

■ *Explanation: Wi-Fi is based on the IEEE 802.11 family of standards. Wi-Fi 6 (802.11ax) is the latest widely deployed standard (2019), offering speeds up to 9.6 Gbps. Wi-Fi 7 (802.11be) is emerging. The Wi-Fi Alliance maintains the trademark. IEEE 802.3 = Ethernet (wired); 802.15 = Bluetooth; 802.16 = WiMAX.*

Q27. What is a computer virus?

A) A hardware malfunction that corrupts data

B) Malicious software that attaches itself to legitimate programs and replicates by modifying other computer programs

C) A network intrusion tool for hackers only

D) An email spam filter

✔ Correct Answer: B) Malicious software that attaches itself to legitimate programs and replicates by modifying other computer programs

■ *Explanation: A computer virus is a type of malware that attaches itself to executable files and replicates when the infected file is executed, potentially corrupting data, stealing information, or damaging system files. Other malware types: Worm (self-replicating, spreads via networks without needing host files), Trojan Horse (disguised as legitimate software), Ransomware (encrypts files for ransom), Spyware.*

Q28. Phishing is a cyberattack method where attackers:

A) Physically steal computer hardware

B) Deceive users into revealing sensitive information by disguising as trustworthy entities

C) Overload a server with traffic (DDoS)

D) Intercept network packets to steal data

✔ Correct Answer: B) Deceive users into revealing sensitive information by disguising as trustworthy entities

■ *Explanation: Phishing is a social engineering cyberattack where attackers send fraudulent emails, messages, or create fake websites impersonating legitimate organisations (banks, government, IRCTC) to trick users into revealing passwords, credit card numbers, or other sensitive data. Spear Phishing targets specific individuals; Whaling targets high-profile executives.*

★ ■ CYBERSECURITY & CYBER THREATS ★

Q29. Two-Factor Authentication (2FA) enhances security by requiring:

A) Two different passwords for the same account

B) Something you know (password) + something you have (OTP/token) or something you are (biometric)

C) Changing password every two days

D) Two separate internet connections

✔ Correct Answer: B) Something you know (password) + something you have (OTP/token) or something you are (biometric)

■ *Explanation: 2FA (Two-Factor Authentication) combines two of the three authentication factors: (1) Something you KNOW — password or PIN; (2) Something you HAVE — OTP on phone, security token, smart card; (3) Something you ARE — fingerprint, iris scan, face recognition (biometrics). This significantly reduces account compromise risk even if password is stolen.*

Q30. A DDoS attack stands for Distributed Denial of Service. It works by:

A) Installing malware on a target computer

B) Overwhelming a server/website with traffic from multiple infected computers (botnet) to make it unavailable

C) Stealing data through unencrypted connections

D) Cracking passwords using brute force

✔ Correct Answer: B) Overwhelming a server/website with traffic from multiple infected computers (botnet) to make it unavailable

■ *Explanation: A DDoS (Distributed Denial of Service) attack floods a target server, network, or website with massive internet traffic from thousands of compromised computers (botnet) simultaneously, overwhelming it and making it unavailable to legitimate users. It is different from a simple DoS attack (single source). DDoS attacks are commonly used to disrupt banks, government websites, and e-commerce platforms.*

Q31. Ransomware is a type of malware that:

A) Monitors user activity and sends data to hackers

B) Encrypts victim's files and demands payment (ransom) for the decryption key

C) Deletes all files permanently without any message

D) Converts a computer into a Bitcoin mining machine

✔ Correct Answer: B) Encrypts victim's files and demands payment (ransom) for the decryption key

■ *Explanation: Ransomware encrypts the victim's files (making them inaccessible) and demands payment (usually in cryptocurrency like Bitcoin) for the decryption key. Famous ransomware attacks: WannaCry (2017, affected 200,000+ computers in 150 countries including NHS UK), NotPetya (2017), and AIIMS Delhi cyberattack (2022 ransomware attack).*

Q32. DBMS stands for Database Management System. SQL is the standard language for relational databases. What does SQL stand for?

A) System Query Language

B) Structured Query Language

C) Standard Question Language

D) Sequential Query Logic

✔ Correct Answer: B) Structured Query Language

■ *Explanation: SQL (Structured Query Language) is the standard language for managing and manipulating relational databases. Common SQL commands: SELECT (retrieve data), INSERT (add data), UPDATE (modify data), DELETE (remove data), CREATE TABLE, and DROP TABLE. Popular RDBMS: MySQL, PostgreSQL, Oracle, Microsoft SQL Server, SQLite.*

Q33. In Microsoft Excel, which function calculates the sum of a range of cells?

A) =COUNT(A1:A10)

B) =TOTAL(A1:A10)

C) =SUM(A1:A10)

D) =ADD(A1:A10)

✔ Correct Answer: C) =SUM(A1:A10)

■ *Explanation: =SUM(A1:A10) calculates the sum of all values in cells A1 through A10. Other key Excel functions: =AVERAGE() for mean, =COUNT() for counting cells with numbers, =MAX() for maximum, =MIN() for minimum, =IF() for conditional logic, =VLOOKUP() for vertical lookup. Excel files are saved as .xlsx (Excel 2007+) or .xls (older).*

★ ■■ DATABASES, MS OFFICE & FILE FORMATS ★

Q34. In Microsoft Word, the shortcut to Save a document is:

A) Ctrl + P

B) Ctrl + S

C) Ctrl + Z

D) Ctrl + B

✔ Correct Answer: B) Ctrl + S

■ *Explanation: Common MS Word keyboard shortcuts: Ctrl+S = Save, Ctrl+C = Copy, Ctrl+V = Paste, Ctrl+X = Cut, Ctrl+Z = Undo, Ctrl+Y = Redo, Ctrl+B = Bold, Ctrl+I = Italic, Ctrl+U = Underline, Ctrl+P = Print, Ctrl+A = Select All, Ctrl+F = Find, Ctrl+Home = Go to beginning.*

Q35. The file extension .pdf stands for:

A) Personal Document Format

B) Portable Document Format

C) Printed Data File

D) Processed Data Format

✔ Correct Answer: B) Portable Document Format

■ *Explanation: PDF (Portable Document Format) was developed by Adobe Systems in 1993. PDF files preserve document formatting across all platforms and devices regardless of the software or operating system. Other common file extensions: .docx (Word), .xlsx (Excel), .pptx (PowerPoint), .jpg/.png (images), .mp3 (audio), .mp4 (video), .exe (executable).*

Q36. WWW (World Wide Web) was invented by which scientist and in which year?

A) Bill Gates – 1990

B) Tim Berners-Lee – 1989/1991

C) Vint Cerf – 1983

D) Marc Andreessen – 1993

✔ Correct Answer: B) Tim Berners-Lee – 1989/1991

■ *Explanation: Tim Berners-Lee, a British scientist at CERN (Switzerland), invented the World Wide Web in 1989 (proposal) and implemented it in 1991. He also created the first web browser (WorldWideWeb), the first web server, and developed HTML, HTTP, and URL. He founded W3C (World Wide Web Consortium) to maintain web standards. The web and the internet are different — the internet is the infrastructure; the web is a service running on it.*

Q37. A cookie in web browsing is:

A) A virus attached to websites

B) A small text file stored by a website on a user's browser to remember preferences or session information

C) A type of web advertisement

D) An encrypted security key

✔ Correct Answer: B) A small text file stored by a website on a user's browser to remember preferences or session information

■ *Explanation: Cookies are small text files that websites store on a user's browser to: remember login sessions, store shopping cart items, track user preferences, and analyse browsing behaviour (analytics cookies). Session cookies expire when the browser closes; persistent cookies remain. Third-party cookies (used for cross-site tracking) are being phased out due to privacy concerns.*

★ ■ INTERNET & WEB TECHNOLOGIES ★

Q38. Cloud Computing refers to delivering computing services — servers, storage, databases, networking, software — over the Internet. The three main service models are:

A) Public, Private, Hybrid Cloud

B) IaaS, PaaS, SaaS (Infrastructure, Platform, Software as a Service)

C) Server, Client, P2P Computing

D) Centralised, Distributed, Grid Computing

✔ Correct Answer: B) IaaS, PaaS, SaaS (Infrastructure, Platform, Software as a Service)

■ *Explanation: The three cloud service models are: IaaS (Infrastructure as a Service) — virtualised computing resources over internet (AWS EC2, Azure); PaaS (Platform as a Service) — development platform for building applications (Google App Engine, Heroku); SaaS (Software as a Service) — software accessed via browser (Gmail, MS Office 365, Salesforce). Major cloud providers: Amazon AWS, Microsoft Azure, Google Cloud.*

Q39. What is Blockchain technology?

A) A type of internet connection faster than fibre optic

B) A distributed, decentralised digital ledger that records transactions across multiple computers securely

C) A programming language for web development

D) An AI model that predicts financial markets

✔ Correct Answer: B) A distributed, decentralised digital ledger that records transactions across multiple computers securely

■ *Explanation: Blockchain is a distributed ledger technology where transactions are recorded in 'blocks' that are cryptographically linked (chained) in chronological order across thousands of computers (nodes). Once recorded, data cannot be altered. It underpins cryptocurrencies (Bitcoin, Ethereum) and has applications in supply chain, voting, healthcare, and digital identity.*

Q40. Artificial Intelligence (AI) subfields include Machine Learning (ML) and Deep Learning (DL). What is the correct relationship between them?

A) ML is a subset of DL; DL is a subset of AI

B) AI is a subset of ML; ML is a subset of DL

C) AI is the broadest; ML is a subset of AI; DL is a subset of ML

D) All three are separate, unrelated fields

✔ Correct Answer: C) AI is the broadest; ML is a subset of AI; DL is a subset of ML

■ *Explanation: The correct hierarchy: Artificial Intelligence (AI) – broadest field, any technique enabling machines to mimic human intelligence → Machine Learning (ML) – AI that learns from data without being explicitly programmed → Deep Learning (DL) – ML using artificial neural networks with multiple layers, inspired by the human brain. GPT models (ChatGPT) use Deep Learning.*

Q41. DigiLocker, an initiative of India's Digital India programme, is a platform that provides citizens with:

A) Free cloud storage of 100 GB for personal files

B) Digital access to official documents (Aadhaar, PAN, driving licence, educational certificates) issued by government

C) A secure email service for government employees only

D) An online voting platform

✔ Correct Answer: B) Digital access to official documents (Aadhaar, PAN, driving licence, educational certificates) issued by government

■ *Explanation: DigiLocker (launched 2015, under MeitY) provides a secure cloud-based platform for storing, accessing, and sharing government-issued digital documents — Aadhaar, PAN, driving licence, vehicle RC, educational marksheets, insurance policies. Documents on DigiLocker are legally equivalent to physical originals. It has 250+ million registered users (2024).*

★ ■■ DIGITAL INDIA & E-GOVERNANCE ★

Q42. Aadhaar is India's biometric digital identity system. It is managed by:

A) Ministry of Home Affairs

B) Unique Identification Authority of India (UIDAI)

C) National Payments Corporation of India (NPCI)

D) Reserve Bank of India (RBI)

✔ Correct Answer: B) Unique Identification Authority of India (UIDAI)

■ *Explanation: Aadhaar is managed by UIDAI (Unique Identification Authority of India) — a statutory authority established under the Aadhaar Act 2016, under the Ministry of Electronics and IT (MeitY). Aadhaar is a 12-digit unique identity number backed by biometrics (fingerprints, iris scan, photograph). Over 1.38 billion Aadhaar cards have been issued (2024).*

Q43. UMANG (Unified Mobile Application for New-age Governance) app provides access to services from how many central and state government departments?

A) 50+ departments

B) 100+ departments

C) 1,200+ departments and service providers

D) 500+ departments

✔ Correct Answer: C) 1,200+ departments and service providers

■ *Explanation: UMANG (Unified Mobile Application for New-age Governance) is a unified mobile app providing access to 1,200+ government services across central and state departments — including EPFO, income tax filing, Aadhaar services, CBSE results, agriculture services, and more. It is available in 13 Indian languages and was developed by NIC and MeitY.*

Q44. India's National Supercomputing Mission (NSM) aims to build a network of how many supercomputers?

A) 10 supercomputers

B) 24 supercomputers

C): 70 supercomputers

D) 100 supercomputers

✔ Correct Answer: C): 70 supercomputers

■ *Explanation: India's National Supercomputing Mission (NSM), launched in 2015 with a ■4,500 crore budget, aims to build a network of 70 high-performance computing (HPC) facilities/supercomputers across research institutions, IITs, IISc, and national labs. PARAM Siddhi (IIT Kharagpur), PARAM Pravega (IISc), and PARAM Ganga (IIT Roorkee) are deployed under NSM.*

Q45. SSD (Solid State Drive) is faster than HDD (Hard Disk Drive) because:

A) SSDs use laser beams to read data

B) SSDs use flash memory with no moving parts, while HDDs use spinning magnetic platters

C) SSDs have larger storage capacity

D) SSDs require less electricity and generate no heat

✔ Correct Answer: B) SSDs use flash memory with no moving parts, while HDDs use spinning magnetic platters

■ *Explanation: SSDs use NAND flash memory (non-volatile semiconductor storage) with no moving parts — enabling much faster read/write speeds (500+ MB/s vs 100–150 MB/s for HDD), lower power consumption, no noise, and better durability. HDDs use spinning magnetic platters with a read/write arm — making them slower but cheaper per GB and better for large-capacity storage.*

★ ■ STORAGE & EMERGING TECHNOLOGIES ★

Q46. 5G technology compared to 4G LTE offers which primary improvements?

A) Only wider coverage in rural areas

B) Higher speeds (up to 10 Gbps), lower latency (1ms), and massive device connectivity (IoT)

C) Better voice call quality only

D) Lower radiation and improved battery life only

✔ Correct Answer: B) Higher speeds (up to 10 Gbps), lower latency (1ms), and massive device connectivity (IoT)

■ *Explanation: 5G (5th Generation mobile network) offers: speeds up to 10 Gbps (vs 4G's ~100 Mbps); ultra-low latency of 1ms (vs 4G's 50ms); and connection of up to 1 million devices per sq km (critical for IoT). Key use cases: autonomous vehicles, smart cities, telemedicine, Industry 4.0, and AR/VR. India launched 5G in October 2022.*

Q47. IoT (Internet of Things) refers to:

A) The internet backbone infrastructure of data centres

B) A network of physical objects (devices, vehicles, appliances) embedded with sensors and internet connectivity to exchange data

C) Online financial transactions between businesses

D) Cloud storage services for businesses

✔ Correct Answer: B) A network of physical objects (devices, vehicles, appliances) embedded with sensors and internet connectivity to exchange data

■ *Explanation: The Internet of Things (IoT) refers to interconnected physical devices embedded with sensors, software, and connectivity that collect and exchange data over the internet without human intervention. Examples: smart home devices (Alexa, Google Home), smart electricity meters, wearables (smartwatches), connected cars, smart agriculture sensors, and industrial monitoring systems.*

Q48. Quantum computing uses qubits instead of classical bits. What is unique about a qubit?

A) A qubit can only be 0 or 1 like classical bits

B) A qubit can exist in a superposition of 0 and 1 simultaneously until measured

C) A qubit operates at room temperature unlike classical chips

D) A qubit requires no electricity to function

✔ Correct Answer: B) A qubit can exist in a superposition of 0 and 1 simultaneously until measured

■ *Explanation: A qubit (quantum bit) can exist in a superposition of 0 AND 1 simultaneously — unlike classical bits (which are strictly 0 OR 1). Additionally, qubits can be entangled (correlated regardless of distance). These properties allow quantum computers to solve certain problems (factoring large numbers, drug discovery, cryptography, optimisation) exponentially faster than classical computers.*

Q49. ChatGPT, the AI chatbot by OpenAI, is based on which type of AI model?

A) Expert System

B) Large Language Model (LLM) using transformer architecture

C) Rule-based logic engine

D) Bayesian probability network

✔ Correct Answer: B) Large Language Model (LLM) using transformer architecture

■ *Explanation: ChatGPT (Chat Generative Pre-trained Transformer) is powered by GPT (Generative Pre-trained Transformer) — a Large Language Model (LLM) based on the Transformer architecture (introduced by Google in 2017). OpenAI released ChatGPT in November 2022. It is trained on vast text data and can generate human-like text, code, and answers. GPT-4 is OpenAI's most advanced model.*

Q50. India's semiconductor fabrication initiative — India Semiconductor Mission (ISM) — was approved with what outlay to incentivise chip manufacturing in India?

A) ■10,000 crore

B) ■45,000 crore

C) ■76,000 crore

D) ■1,00,000 crore

✔ Correct Answer: C) ■76,000 crore

■ *Explanation: India Semiconductor Mission (ISM) was approved with an outlay of ■76,000 crore to provide financial support to companies setting up semiconductor fabs, ATMP (Assembly, Testing, Marking and Packaging), and compound semiconductor units in India. Tata Electronics (Dholera), Micron Technology (Sanand), and CG Power are among the approved projects under ISM.*

Q51. Generative AI is capable of creating new content (text, images, audio, video). Which of the following is an example of a Generative AI image model?

A) ChatGPT (OpenAI)

B) DALL·E / Stable Diffusion / Midjourney

C) AlphaGo (DeepMind)

D) Watson (IBM)

✔ Correct Answer: B) DALL·E / Stable Diffusion / Midjourney

■ *Explanation: DALL·E (OpenAI), Stable Diffusion (Stability AI), and Midjourney are Generative AI image models that create photorealistic images, artwork, and designs from text prompts. ChatGPT generates text; AlphaGo plays the board game Go; Watson is an enterprise AI platform. India's own Generative AI models include those from IIT Madras and startups under the India AI Mission.*

Q52. The Computer Emergency Response Team – India (CERT-In) operates under which ministry and is responsible for what function?

A) Ministry of Defence – managing military cyber operations

B) Ministry of Electronics and IT (MeitY) – national cybersecurity incident response

C) Ministry of Finance – securing banking digital infrastructure

D) Ministry of Home Affairs – cybercrime investigation

✔ Correct Answer: B) Ministry of Electronics and IT (MeitY) – national cybersecurity incident response

■ *Explanation: CERT-In (Indian Computer Emergency Response Team), established in 2004 under the IT Act 2000, operates under MeitY. It is India's national nodal agency for responding to cybersecurity incidents, issuing advisories on vulnerabilities, coordinating incident response, and promoting cyber hygiene. In 2022, CERT-In mandated all organisations to report cyber incidents within 6 hours.*

Q53. The IT (Amendment) Act 2008 introduced Section 66A, which was later struck down by the Supreme Court. The currently active Section 66 of the IT Act deals with:

A) Penalty for publishing obscene material online

B) Computer-related offences – hacking and damage to computer systems

C) Data protection and privacy rights

D) Regulation of social media intermediaries

✔ Correct Answer: B) Computer-related offences – hacking and damage to computer systems

■ *Explanation: Section 66 of the IT Act 2000 (as amended 2008) covers computer-related offences — hacking, unauthorised access, damage to computer systems. Section 66A (sending offensive messages) was struck down by the Supreme Court in 2015 (Shreya Singhal vs Union of India) for violating free speech. The IT Rules 2021 introduced new intermediary guidelines and social media regulations.*

Q54. India's Digital Personal Data Protection (DPDP) Act 2023 provides citizens with which rights regarding their personal data?

A) Right to delete government records about them

B) Rights to access, correction, erasure, and grievance redressal related to their personal data processed by data fiduciaries

C) Right to sue foreign companies for data breaches

D) Right to share data with third parties without consent

✔ Correct Answer: B) Rights to access, correction, erasure, and grievance redressal related to their personal data processed by data fiduciaries

■ *Explanation: The Digital Personal Data Protection (DPDP) Act 2023 (enacted August 2023) is India's first comprehensive data protection law. It grants data principals (citizens) rights including: right to access information, right to correction/erasure of personal data, right to grievance redressal, and right to nominate. It creates a Data Protection Board of India (DPBI) for enforcement. Consent is mandatory before processing personal data.*

Q55. The '.in' domain is India's country code top-level domain (ccTLD). Which Indian organisation manages it?

A) TRAI (Telecom Regulatory Authority of India)

B) National Internet Exchange of India (NIXI)

C) CERT-In

D) MeitY directly

✔ Correct Answer: B) National Internet Exchange of India (NIXI)

■ *Explanation: The '.in' country code top-level domain (ccTLD) is managed by NIXI (National Internet Exchange of India) through its INRegistry arm. NIXI also manages India's Internet Exchange Points (IXPs) that route domestic internet traffic locally, reducing latency and international bandwidth costs. The global authority for domain names is ICANN (Internet Corporation for Assigned Names and Numbers).*