

COMPUTER — FULL MIND MAP

Topic-wise · Fully Explained · Hinglish · SSC / BPSC / BSSC / Railway

Questions 1603 – 1792

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1. CPU, Registers & Processing Basics

- **ALU (Arithmetic Logic Unit)** — CPU ka part, arithmetic + logic operations (AND, OR, NOT, comparisons) karta hai — data store/retrieve karna iska primary function NAHI hai (trap). **Control Unit** — processor ki operations control/direct karta hai, flip-flops/logic gates/digital circuits se bana hota hai. [Q1613, Q1658, Q1733]
- **Registers: MAR (Memory Address Register)** — memory mein access ki jaane wali location ka address hold karta hai. **MDR** — data jo write/read hona hai. **IR (Instruction Register)** — last fetched instruction hold karta hai. **PC (Program Counter)** — next instruction ka address hold karta hai. **Instruction Buffer Register (IBR)** — jo instruction turant execute nahi honi, wahan place hoti hai. **Registers (overall)** — **high-speed CPU device jo data temporarily processing ke dauraan store karta hai** (types: accumulator, data/address registers, PC, MBR, index registers). [Q1646, Q1734, Q1706, Q1699]
- **CPU bus types: Data bus** — memory aur CPU ke beech data transfer karta hai. **Address bus** — CPU aur main memory ke beech addresses transfer karta hai, iski **width max possible memory decide karti hai**. **Control bus** — CPU aur components ke beech communication manage karta hai. [Q1621, Q1623]
- **Parity bit** — extra bit jo binary message mein total 1s ko odd/even banane ke liye add hoti hai (error detection). **Single Core** — **sabse purana CPU type** hai. **CPU speed** — **Hertz (Hz)** mein measure hoti hai (CPU cycle represent karta hai). [Q1622, Q1715, Q1777]
- **Motherboard** — CPU aur RAM jaise system components directly isi se connect hote hain (hardware components ke beech connectivity deta hai). [Q1690]

2. Memory & Storage Devices

- **ROM (Read-Only Memory)** — information permanently store karta hai. Types: **Mask ROM** (manufacturing ke time program hoti hai, alter nahi ho sakti), **PROM** (ek baar program, erase/reprogram nahi ho sakti), **EPROM** (UV light se erase, multiple-times reprogram), **EEPROM** (electrically erase/reprogram, sabse flexible). [Q1605]
- **RAM (Random Access Memory)** — CPU is memory se directly interact karta hai read/write ke liye, **short-term/volatile memory** hai (device off hone par data lost), BIOS se check hoti hai. **RAM — sabse fast read/write storage** hai computer mein. [Q1618, Q1637, Q1785]
- **Cache Memory** — CPU aur RAM ke beech buffer ki tarah kaam karta hai (high-speed, frequently-used data hold karta hai), **permanent use ke liye data store NAHI karta** (trap — temporary/frequently-used data ke liye hota hai). [Q1643, Q1645, Q1700]
- **Secondary memory** — non-volatile hoti hai (examples: Hard Drive, SSD, Flash, Optical Drive) — '**volatile memory**' statement is baare mein **INCORRECT** hai (trap). **Solid State Drive (SSD)** — 'electronic disk' bhi kehlata hai, HDD se 25-100x faster. [Q1676, Q1698]
- **Blu-ray Disc — 120mm diameter** (DVD/CD jaisa hi size), 1.2mm thick, 25GB/50GB capacity. **Magnetic storage examples:** Hard Disk Drive, Floppy Disk, Magnetic Tape, Magnetic Drum (Memory Card/flash memory **magnetic storage NAHI** hai — trap). **Tape drive** — system images/complete backups banata hai, restoration process lamba ho sakta hai. [Q1657, Q1738, Q1640]
- **Pendrive — flash drive** bhi kehlata hai (USB interface ke saath flash memory). **NAS (Network Attached Storage)** — LAN users ko centralized disk storage deta hai, standard Ethernet connection se. [Q1726, Q1718]

3. Input/Output Devices, Printers & Ports

- **Input devices:** Keyboard, Mouse, Scanner, Microphone, Webcam, MICR, Joystick, Touchscreen, Touchpad, Digital Pen, Barcode reader, Trackball. **Output devices:** Monitor, Headphones, Speakers, Projector, GPS, Sound/Video Card, Printer, OMR, Braille reader, Plotter. [Q1612, Q1650, Q1672]
- **Dot Matrix Printer — Character Printer** hai, speed **CPS (characters per second)** mein measure hoti hai, Indian Railway use karti hai, impact printer hai. **Laser Printer** — non-impact, laser-beam + electro-photographic technique use karti hai; **ek saath multiple copies print NAHI kar sakti** (trap statement). [Q1680, Q1688, Q1703]
- **Ports: PS/2 port** — mini-DIN connector, keyboard/mouse connect karta hai, 'mouse port' bhi kehlata hai (6-pin). **Parallel port** — 'Line Printer Port' bhi kehlata hai, multiple bundled cables se data transmit karta hai. **Serial port** — ek time mein ek bit transmit karta hai, slow data long distances ke liye. **VGA connector** — monitor ko video card se connect karta hai, **15 holes**. [Q1656, Q1745, Q1712, Q1725, Q1707]
- **Joystick** — lever jo image movement control karta hai monitor par. **Modem** — computer files telephone lines ke through send/receive karta hai. **Graphics Tablet** — electronic writing area + special pen. **OCR (Optical Character Reader)** — printed text character-by-character scan karta hai. **Repeater** — weak signal receive karke regenerate karta hai. [Q1782, Q1783, Q1784, Q1731, Q1659]

4. Networking Basics & Protocols

- **Network topologies (6 types):** Bus, Ring, Tree, Star (**N nodes host se — N lines chahiye**), Mesh (**n(n-1)/2 lines chahiye** — jaise 6 nodes ke liye 15 lines), Hybrid. [Q1661, Q1671]
- **OSI model devices: Network Switch — Layer 2**, MAC addresses ke basis par data forward karta hai. Hub — multiple devices link karta hai. Router — packet-switched networks connect karta hai. [Q1639]
- **Data transmission modes: Simplex** — ek direction (Keyboard/Monitor). **Half-duplex** — dono directions but ek time pe ek (Walkie-Talkie). **Full-duplex** — dono directions simultaneously (Telephone). [Q1669]
- **ISP (Internet Service Provider)** — subscriber's computer ko modem se internet se connect karta hai (examples: Airtel, Jio, BSNL). **Protocol** — telecommunication connection ke different levels par exist karne wale rules. **Bandwidth** — bit-rate of information capacity, bits/second mein express hoti hai. [Q1632, Q1722, Q1740]

● **DHCP** — IP addresses dynamically assign karta hai devices ko. **TCP (Transmission Control Protocol)** — specify karta hai data kaise exchange/break hota hai IP packets mein. **Internet connection speed (decreasing order)**: Fiber → Cable → Satellite → DSL → Wireless → **Dial-up (slowest)**. **LTE (Long-Term Evolution)** — **4G wireless technology** hai (3G se zyada capacity/speed). [Q1617, Q1736, Q1772, Q1683]

5. Network Security — Malware, Attacks & Hackers

- **DDoS attack** — distributed denial-of-service, network security ka severe threat. **Phishing** — 4 types: Spear Phishing, Whaling, Vishing, Email Phishing; social security number/bank info/login details chura ne ki trick. **Firewall** — incoming/outgoing packets predefined rules ke basis par analyse/filter karta hai. [Q1606, Q1607, Q1644, Q1751]
- **Firewall types: Network-layer firewall** — packets Network layer par examine karta hai. Application-level gateway — application layer. Circuit-level gateway — session layer (Layer 5). Proxy firewall — application layer, intermediate device ki tarah. [Q1625]
- **Hacker types: Black hat (crackers)** — unauthorised access ke liye harmful hacking. White hat — ethical hacker, vulnerabilities identify karta hai. Red hat — black hat hackers ko stop karne ke liye aggressive. Grey hat — kabhi-kabhi ethical standards violate karta hai but malicious intent nahi. [Q1655]
- **Malware types: Trojan** — legitimate-looking emails/files se spread hota hai. **Worm/self-replicating program** — network par propagate hota hai. **Keylogger** — malware ya hardware, keyboard ke keys record karta hai. **Adware** — infect karne ke baad ads dikhakar ya pay-per-click se revenue generate karta hai. **Ransomware (CryptoLocker)** — infected computers ka access restrict karta hai encryption se. **Resident virus** — system memory mein embed hoti hai, original delete hone par bhi reactivate ho sakti hai. **SOVA Virus** — **Malware** hai. [Q1647, Q1631, Q1724, Q1720, Q1742, Q1713, Q1678]

6. Internet, Browsers & Email

- **URL parts**: scheme, sub-domain, **domain name**, top-level domain, port number, path, query, parameters, fragment. **Search engine** — user queries se searcher intent establish karta hai (Google, Bing, Yahoo). **Web browsers**: Chrome, Firefox, Safari, Opera, **Edge (Microsoft ne banaya)**. **Facebook** — **web browser NAHI** hai (social networking site hai — trap). **Mosaic** — **pehla popular web browser (1993, NCSA ne develop kiya)**. [Q1603, Q1624, Q1616, Q1642, Q1743, Q1685]
- **Rendering engine** — browser mein web pages display karta hai. **Spider** — web crawl karke websites index karta hai search engines ke liye. **Cookies** — **third-party cookies** track karte hain aur privacy expose karte hain. [Q1711, Q1761, Q1710]
- **Email protocols: POP (Post Office Protocol)** — Delete Mode aur Keep Mode dono included hain, TCP port 110. Email parts: To, CC (carbon copy), **BCC** — **primary recipient ke alawa doosron ko copy secretly milta hai**, attachment, subject line. [Q1626, Q1610, Q1627, Q1653]
- **User Agents (UA)** — sender/receiver same system par ho to sirf **ek UA** chahiye. GUI-based email clients — Netscape, Outlook, Eudora (command-driven — mail, pine, elm). [Q1635, Q1633]
- **Tim Berners-Lee** — **World Wide Web 1989** mein invent ki (CERN mein), first web client/server 1990 mein likha. [Q1693]
- **Email protocol (send/receive)** — **SMTP/POP** jaisa protocol commonly use hota hai (SSH secure commands ke liye hai, FTP files transfer ke liye, HTTP web pages ke liye — email ke liye NAHI). **Outlook, Gmail, Yandex** — **sab email service providers hain** (koi bhi INCORRECT nahi). [Q1611, Q1705]
- **Bookmark current webpage shortcut** — **Ctrl+D**. **Reload current page (Google search)** — **F5**. **NLP (Natural Language Processing)** — AI ki branch, computers ko human language **understand, interpret, manipulate** teeno karne mein help karti hai. [Q1721, Q1708, Q1664]
- **Application server** — software developer ko components ek API ke through accessible karata hai (platform khud define karta hai). **Web server (incorrect statement trap)** — memory download karne wale **device** mein chahiye, webserver mein nahi. [Q1728, Q1735]

7. MS Word — Features & Shortcuts

- **Alignment options** — Left (Ctrl+L), Right (Ctrl+R), Center (Ctrl+E), Justify (Ctrl+J). **Common shortcuts:** Ctrl+N (new doc), Ctrl+O (open), Ctrl+S (save), Ctrl+W/Alt+F4 (close), **Ctrl+End (document ke end tak jaana)** — Shift+End NAHI (sirf line ka end select karta hai — trap), Ctrl+P (print), Ctrl+K (hyperlink insert), Ctrl+M (indent paragraph). [Q1604, Q1614, Q1654, Q1677, Q1684, Q1709, Q1727]
- **Cursor movement:** Ctrl+Left arrow — ek word left. **Print Preview** — document print hone par kaisa dikhega dekhne ke liye (Ctrl+F2/Ctrl+P). **Word Wrap, Spell Check, Mail Merge** — important MS Word features. **'Paste' shortcut** — **Ctrl+V** (Ctrl+C copy, Ctrl+Z undo, Ctrl+X cut, in sab se alag). **F7 — Editor task pane khol kar spelling/grammar check karta hai.** [Q1662, Q1648, Q1609, Q1675]
- **Quick Access Toolbar** — default mein Save/Undo/Redo buttons hote hain (Cut NAHI hota by default), 'show below the Ribbon' option available hai. **Templates** — new document banate waqt select kar sakte hain (pre-designed documents). [Q1714, Q1654]
- **File formats:** .doc, .docm (macros), .dotm, .dotx — valid; **.dcp INVALID hai.** Microsoft — HQ Washington, founders Bill Gates aur Paul Allen. **Paragraph formatting 4 tarike se** — left/right/center/justified ('**Precise**' invalid option hai). [Q1674, Q1694]
- **Font effects (Word 2010):** Bold, Italic, Underline, Strikethrough, Super/Sub Script — '**Equalize Character Height**' MS Word mein available NAHI hai (PowerPoint mein hai — trap). **Shading option** — selected text ke peeche ka color change karta hai. **Line spacing** — sirf vertical space determine karta hai (diagonal NAHI). [Q1723, Q1704, Q1744]
- **Custom Print** — specific pages choose karne ke liye print setting. **Word 1.0 — 1983** mein launch hua (Xenix/MS-DOS ke liye, developers Richard Brodie aur Charles Simonyi). [Q1701, Q1757]

8. MS Excel — Features, Functions & Shortcuts

- **Excel terminology:** **Workbook** — poora Excel file (multiple worksheets). **Cell** — worksheet ka basic building block. **Cell reference** — column letter + row number (jaise A10). **Ribbon** — commands/formulas/features top mein. **Range** — 2+ cells ka group. **AutoFill/Flash Fill** — pattern-based data fill features. [Q1608, Q1638, Q1697, Q1702, Q1717]
- **Column hide indicator** — two columns ke beech **single line** (standard divider); single arrow — expand/collapse groups; double arrows — filter data. **Cell reference change without changing formula** — relative/mixed referencing techniques. [Q1619, Q1620]
- **Excel shortcuts:** Ctrl+3 (italic), **underline shortcut**, Ctrl+2 (bold), Ctrl+5 (strikethrough), Ctrl+D (copy topmost cell down), Alt+Enter (new line same cell), Ctrl+N (new blank workbook), Shift+F11 (new worksheet), **Shift+Spacebar (select entire row)**, Ctrl+Spacebar (select column), Alt+I+R (new row above). [Q1660, Q1679, Q1670, Q1696, Q1730, Q1769, Q1741, Q1774]
- **Functions:** **SUM** — values add karta hai. **MATCH** — specified item ki relative position range mein return karta hai (=MATCH(12,{10,13,30,40,60},1) → 1); syntax mein match_type optional hai (**saare arguments required NAHI hote** — trap). **VLOOKUP** — leftmost column mein value dhoondh kar same row se value return karta hai. **TRANSPOSE** — vertical ↔ horizontal range convert karta hai. **Math/trig functions:** ABS, COS, LOG, EXP, EVEN, ODD. [Q1641, Q1746, Q1732, Q1620, Q1716]

9. MS PowerPoint & Other Office Software

- **PowerPoint shortcuts:** Ctrl+M (new blank slide), Ctrl+N (new presentation), Ctrl+Q (save+close), Ctrl+K (hyperlink). **'Share' feature** — presentation ko email se larger audience ke saath share karta hai. PowerPoint features: Designer, Smart Lookup, Morphing, Real-time collab, Version History. [Q1668, Q1663]
- **PowerPoint file formats:** .ppt, .pptx, .pptm (macro-enabled) — valid; **' .ppt' INVALID hai.** **Design tab shortcut** — **Alt+G** (Office 2016). [Q1695, Q1790]

- **MS Office 365 tabs:** **References tab** — Table of Authorities, TOC, footnotes. **Review tab** — proofing/word count/comments. **Layout tab** — Page Setup dialog box, page background, paragraph. **Insert tab** — pages/tables/pictures/links/header-footer. [Q1628, Q1634]
- **LibreOffice Suite** — Writer (word processing), Calc (spreadsheets), Impress (presentations), Draw, Base, Math — '**LibreOffice Excel**' **NAHI exist karta** (trap, 'Calc' hi spreadsheet hai). **CorelDraw** — desktop publishing software. **GIMP** — application software (GNU Image Manipulation Program). **Spreadsheet software** — financial statements ke liye best (Excel). **Database software** — dBase (MySQL, MS Access, Oracle bhi). [Q1737, Q1767, Q1759, Q1666, Q1692]

10. Windows OS & File Explorer Shortcuts

- **File Explorer shortcuts (Win 11):** Alt+D (address bar), Ctrl+E (search box), Ctrl+N (new window), **Num Lock + *** (subfolders display), Num Lock + + (folder contents), Num Lock + - (collapse). '**Hidden Items**' — **Show menu (View tab ke under)** mein hai. Compact view — space kam karta hai files ke beech. [Q1615, Q1649, Q1629, Q1636]
- **Windows shortcuts:** **Win+D** — desktop show/hide + minimize all. Win+L — lock screen. Win+M — minimize all. Win+G — Xbox Game Bar. Win+H — voice typing. **Alt+Tab** — apps switch karna. Shift+Insert — paste. **Alt+Enter** — selected item ki properties open karta hai (Win 10 home screen). [Q1652, Q1687, Q1682, Q1630, Q1766, Q1729]
- **Navigation Pane** — File Explorer ka **left** side hota hai (right side 'Preview Pane' hai — trap statement). **Hanging** — computer unresponsive ho jaana (program/system dono unresponsive). [Q1719, Q1749]

11. Operating Systems & Software Types

- **Software categories:** System Software (OS — Fedora, Ubuntu, Unix, Linux, Android, Windows) aur Application Software. **Kernel** — OS ka core, hardware-software interactions facilitate karta hai. **User Interface** — OS ka part jo user enter/receive information ke liye use karta hai. [Q1665, Q1755, Q1764]
- **Windows OS** — **1985** mein pehli baar introduce hua (MS-DOS ke liye GUI shell). **UNIX** — **pehla OS jo 'C' language mein likha gaya** (Dennis Ritchie, Bell Labs, early 1970s). **Real-time OS** — specified time constraints ke andar response guarantee karta hai. **Windows** — **open-source OS NAHI hai** (closed source — trap; Linux/Ubuntu/Fedora open-source hain). [Q1754, Q1770, Q1758, Q1748]

12. Programming Languages & Concepts

- **C++** — **Object-Oriented Language** hai (doosre OOP languages: Java, C#, Python, PHP). **Java** — James Gosling ne banaya, platform-independent, pehle 'Oak' kehlata tha. **BASIC** — John G Kemeny aur Thomas E Kurtz ne banaya, personal computers ke liye pehli language. **Pascal** — Niklaus Wirth ne banaya, teaching ke liye. [Q1686, Q1673]
- **Pseudocode** — high-level language mein code likhne se pehle program logic represent karta hai. **Algorithm** — finite set of instructions ek task accomplish karne ke liye. **Flowchart** — program logic ka diagrammatic representation. **SQL** — **4th generation language (4GL) ka example** hai (non-procedural, database access karne ke liye). [Q1691, Q1763, Q1786, Q1752]
- **Programming languages ke saal:** **JavaScript** — **1995**, C++ (1983), Python (1991), SQL (1972), MATLAB (1978), Swift (2014). **FORTTRAN (pehli high-level language)** — **John Backus** ne banayi. **LISP (AI ke liye)** — **John McCarthy** ne banayi (unhone 'Artificial Intelligence' term bhi coin kiya). [Q1780, Q1773, Q1792]
- **Stack** — ordered list, insertions/deletions ek hi end par hoti hain. **Queue** — 'front'/'rear' terms use karti hai. [Q1750]

13. Computer History, Generations & Inventors

- **Computer generations: 1st (1940-56)** — Vacuum tubes (ENIAC, EDVAC, EDSAC, UNIVAC I). **IBM 360** — 3rd generation. **PARAM supercomputer** — 5th generation (Vijay P. Bhatkar ne architect kiya, PARAM 8000 — 1991, C-DAC Pune). [Q1667, Q1681]
- **ENIAC (Electronic Numerical Integrator and Computer)** — pehla programmable general-purpose electronic digital computer, **USA** mein University of Pennsylvania mein develop hua (US Army Ballistic Research Laboratory ke liye). [Q1779, Q1789]
- **Samarendra Kumar Mitra** — **India ka pehla analog computer** design kiya (1954, Indian Statistical Institute, Calcutta). **Intel Corporation** — pehla microprocessor 4004 manufacture kiya. [Q1781, Q1776]
- **Chad Hurley aur Steve Chen (Jawed Karim ke saath)** — **YouTube co-founded** (February 2005, Google ne 2006 mein \$1.65 billion mein khareeda). **Norman Joseph Woodland** — pehla barcode system develop kiya (1952). **Douglas T Ross** — APT (Automatically Programmable Tool) develop kiya. [Q1753, Q1760, Q1788]

14. Data Units, Miscellaneous Terms & Devices

- **Data units:** 1 KB = 2^{10} bytes, MB = 2^{20} , GB = 2^{30} , **1 TB/s = 2^{40} bytes/s**, PB = 2^{50} , EB = 2^{60} , ZB = 2^{70} , YB = 2^{80} . **Nibble = Half byte = 4 bits**. [Q1689, Q1775]
- **ASCII** — American Standard Code for Information Interchange. **EBCDIC** — Extended Binary-Coded-Decimal Interchange Code (IBM ne develop ki). **VRML** — Virtual Reality Markup Language (3D web-based models design karne ke liye). [Q1762, Q1768, Q1778]
- **Computer types:** Laptop = 'Notebook'. Supercomputer, Mainframe, Minicomputer, Workstation, PC — 5 types. Analogue/Digital/Hybrid — data handling ke basis par. **Hybrid computers** — **air traffic control aur national defence radar** mein use hote hain. [Q1739, Q1791]
- **File extensions:** .png (image file), .tmp (temporary file). **Green Channel** — India ka fastest local mail service (same-town delivery next day). **File server** — network ka central server jo storage capacity provide karta hai users ko. [Q1756, Q1747, Q1651, Q1787]
- **Modifier keys** — Shift aur Alt (doosri key ke saath use hoti hain). **Navigation key** — cursor move karne wali key (Arrow keys, PageUp/Down, Home, End). [Q1771, Q1765]