

Information and Communication Technology in Financial Institutions (ICTFI) For AIBB

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Suggestion:

- **Read 4 star and 5 star marked chapters if you have time shortage to read all chapter.**
- **Must read short notes from all chapter.**
- **MetaMentor Center suggest to read whole note to find 100% common in exam. We cover everything in our note.**

Important	Details	Number of Question common in previous years
*****	Module A: Introduction to ICT and Computer Systems	27
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***** All short note from all chapter and end of note *****		

Syllabus

Module-A: Introduction to ICT and Computer Systems

- Information and Communication Technology, Electronic Banking and Online Banking, Mobile Financial Services, Agent Banking, e-commerce and m-Commerce, Computer Hardware, Computer Software, Internet.

Module-B: Different Approaches to Automation of Financial Institutions (FIs)

- Data Center (DC), Near DC, Disaster Recovery Site (DRS), Data Center Standards and certifications, Computer Networking, IT Systems, Storage, Database and backup systems for ICT in FIs, Computerization approaches, Various Software Systems Like Core Banking, Switching, Credit Card, Payment Gateway, Mobile Financial System and Agent Banking Software.

Module-C: Alternative Delivery Channels & Fund Transfer Systems

- Automatic Transaction Machine (ATM), Cash Deposit Machine (CDM), Cash Recycling Machine (CRM), POS terminals, Debit Card, Credit Card, Card technology Internet Banking, SMS and Alert Banking, E-commerce & Internet Payment Gateway, M-Commerce, Mobile Financial Services (MFS), Agent Banking (Biometric Banking), Call Center, Systems for sending fund transfer instruction like Telex, Swift, CHIPS, FEDWIRE.

Module-D: ICT Security, Cyber Security, ICT Risk Management, Standards, Regulations and Legal Framework

- ICT Security, Cyber Security, ICT Risk Management, Security Standards and Regulations, Guideline on ICT Security for Scheduled Banks and Financial Institutions published by the Central Bank of Bangladesh, PCI-DSS, BS 7799 and ISO 27000, Legal framework in Bangladesh (Cyber Law, ICT Act etc.).

Module-E: Document Handling Systems, Additional Banking Applications & Other Aspects.

- Cheque Processing Systems such as Clearing and Settlement Systems, MICR, RTGS, BACH (BACPS & BEFTN) and additional Banking Applications like ERP Software, CRM Software, E-mail software, Anti-Virus and anti-malware software.

Module F: FinTech, Artificial Intelligence and future Technology Based Banking

- Fintech, RegTech and TechFin, Virtual Banking, Basic Crypto Currency, Block Chain Technology, Cloud computing, Internet of Things (IOT), Machine Learning, Data Mining, Data Warehouse, Neural Network, Data Warehouse, Current Trends, Artificial Intelligence.

Module -A:

Introduction to ICT and Computer Systems

Q-01. Banking service is now available anytime. How ICT contributed to this?

Or, Discuss the role of IT in financial sector/ banking sector.

Or, Discuss the use of computer/ progress of IT use in the banking sector.

Or, Describe the recent developments in computer use in the banking sector.

Or, what are the main uses of internet in banks?

The implementation of Information and Communication Technology (ICT) has revolutionized the banking sector, enabling services to be available anytime, anywhere. Here's how:

1. **Online Banking:** ICT introduced online banking platforms where customers can access their accounts, make transactions, pay bills, and check balances without visiting a physical branch.
2. **Mobile Banking:** With smartphones, banking apps allow users to transact on the go, from fund transfers to depositing checks through mobile cameras.
3. **ATMs:** Automated Teller Machines, connected via a network, allow customers to withdraw, deposit, and perform other essential functions 24/7.
4. **Digital Payment Gateways:** ICT has enabled instantaneous online payments, facilitating e-commerce and online purchases.
5. **Customer Support:** Through chatbots and online support systems, banks can assist customers anytime.
6. **Real-time Data Sync:** ICT ensures that bank data is updated in real-time across all platforms, making banking seamless.

Thus, the advent of ICT in banking has made it more convenient and accessible, catering to the needs of a global and digital clientele.

Q-02. What is electronic Banking? Name five electronic banking systems and define them.

Electronic Banking, also known as e-banking, refers to the use of electronic means to conduct banking transactions and services. This includes activities like transferring funds, paying bills, checking account balances, and accessing other financial services via electronic devices such as computers, smartphones, and ATMs. E-banking offers convenience, allowing customers to perform banking tasks from anywhere and at any time. It encompasses various forms of online banking, mobile banking, and telephone banking. E-banking enhances the efficiency of banking operations, reduces the need for physical branch visits, and provides customers with faster and more flexible access to their financial information and services.

Name of five electronic banking:

1. **Online Banking:** This is a service that lets you manage your bank account using a computer or mobile device. You can check balances, transfer money, and pay bills without going to the bank.
2. **Mobile Banking:** This is similar to online banking but done through a special app on your smartphone. It's handy for quick transactions like sending money to a friend or checking your account balance.

3. **ATMs (Automated Teller Machines):** These are machines where you can withdraw cash, deposit money, and sometimes even pay bills. They are available 24/7, making it convenient to access your money.
4. **Electronic Funds Transfer (EFT):** This is a system that moves money electronically between bank accounts. It's used for things like direct deposits of your paycheck or automatic bill payments.
5. **Credit/Debit Card Transactions:** When you use a credit or debit card to make a purchase, the money is electronically transferred from your account to the seller's account. It's quick and eliminates the need for cash.

These electronic banking systems make handling money faster, easier, and often more secure.

Q-03. What is online banking or Any Branch banking? Mention advantages and disadvantages of online banking.

Or, Describe some advantages and disadvantages of Electronic Banking.

Or, Write down the advantages and disadvantages of electronic banking. BPE-96th.

Online Banking: Online banking lets you handle your money through the internet. You can check your account, pay bills, and transfer money without going to the bank.

Any Branch Banking: This means you can do your banking at any branch of your bank, not just the one where you opened your account.

Advantages:

1. **Convenience:** You can do banking 24/7, even from your home or while traveling.
2. **Speed:** Transactions like money transfers are much faster compared to traditional methods.
3. **Easy Record-Keeping:** You can easily check your account history, which helps in budgeting and record-keeping.
4. **Low Cost:** Many electronic services are cheaper or even free, saving both time and money.

Disadvantages:

1. **Security Risks:** There's a risk of hacking, phishing, or other types of fraud.
2. **Technical Issues:** Sometimes websites or apps can be down, or ATMs can malfunction.
3. **Not For Everyone:** Older people or those not comfortable with technology may find it hard to use.
4. **Over-reliance:** Being too dependent on electronic banking could be problematic if you face issues like internet outages.

Q-04. Mention two syntaxes for any two functions of SMS banking.

In SMS Banking, different banks have their own specific syntax or codes that you have to send via SMS to access various services. Below are hypothetical examples for two common functions: checking account balance and transferring money.

1. Check Account Balance:

- **Syntax:** BAL <Account Number>
- **Example:** If your account number is 123456, you'd text BAL 123456 to the bank's designated number.

- **Function:** This SMS command allows you to check the current balance of your account. The bank will reply with an SMS stating your available balance.
- 2. Transfer Money:**
- **Syntax:** XFER <To Account> <Amount>
 - **Example:** If you want to transfer \$100 to an account number 78910, you'd text XFER 78910 100.
 - **Function:** This SMS command initiates a fund transfer from your account to another. The bank usually sends a confirmation SMS and might ask for additional authorization.

Note that these are generic examples, and the actual syntax may vary from bank to bank. Always check your bank's guidelines for accurate information.

Q-05. What is an MFS? Name a few remarkable MFS in Bangladesh. How does Mobile Financial Services (MFS) contribute to financial inclusion for the underserved population? BPE-5th.

Or, Discuss about MFS. BPE-96th.

MFS stands for Mobile Financial Services, a technology that allows people to do various financial activities like transferring money, making payments, and even saving, all through their mobile phones. It has been particularly transformative in countries like Bangladesh where access to traditional banking may be limited.

Some remarkable MFS providers in Bangladesh are:

1. **bKash:** One of the largest mobile financial services, offering a broad range of transactions like cash-in, cash-out, and payments.
2. **Nagad:** A digital financial service promoted by the Bangladesh Post Office, known for its user-friendly interface and lower service charges.
3. **Rocket:** Initially launched as Dutch-Bangla Mobile Banking, it's one of the earliest MFS services in Bangladesh offering a wide range of services.
4. **Sure Cash:** Provides diversified services including remittances, payments, and micro-savings.
5. **M Cash:** Launched by Islami Bank Bangladesh, this focuses on serving the needs of the bank's existing customer base.

How MFS contributes to financial inclusion:

1. **Easy Access:** People can open mobile accounts without visiting a bank branch.
2. **Low Cost:** MFS has low fees, making it affordable for poor and low-income groups.
3. **Safe Transactions:** Users can send, receive, and save money securely through their phones.
4. **Wide Reach:** MFS agents are available in almost every village, ensuring nationwide coverage.

Q-06. What is G2P in MFS? BPE-96th.

G2P in Mobile Financial Services (MFS) stands for "Government-to-Person." It refers to the digital disbursement of government payments or subsidies directly to individuals using mobile financial platforms. G2P initiatives leverage the widespread use of mobile phones to ensure efficient and transparent distribution of funds, reaching beneficiaries in a timely manner. This approach enhances financial inclusion by providing individuals, often in

underserved or remote areas, with access to government benefits, social assistance, or subsidies through their mobile devices. G2P in MFS streamlines the distribution process, reduces administrative costs, and enhances the overall effectiveness of government welfare programs.

Q-07. When MFS started its journey in Bangladesh and which bank started it?

Mobile Financial Services (MFS) began its journey in Bangladesh in 2011. The pioneer in this sector was Dutch-Bangla Bank, which launched its mobile banking platform initially known as "Dutch-Bangla Bank Mobile Banking," later rebranded as "Rocket." The service was groundbreaking in bringing financial services to people who had limited or no access to traditional banking systems. It allowed users to perform a wide range of financial activities like fund transfers, bill payments, and mobile top-ups using mobile phones. The introduction of MFS by Dutch-Bangla Bank opened the door for financial inclusion in Bangladesh, enabling millions to engage in secure and convenient financial transactions. It set the stage for other providers like bKash, Nagad, and many more to enter the market.

Q-08. Consider, your bank is exploring the implementation of mobile wallets to provide customers with a comprehensive financial management solution. The benefits of mobile wallets are outlined in terms of bill payments, fund transfers and expense tracking. Address challenges such as user adoption and security concerns. Highlight strategies to encourage customer trust and loyalty. BPE-97th.

Implementation of Mobile Wallet

Benefits

1. **Bill Payment:** Customers can pay utility bills and merchant payments instantly through the wallet.
2. **Fund Transfer:** Users can send and receive money quickly without visiting a bank branch.
3. **Expense Tracking:** The app records spending history and helps customers manage their budget easily.

Challenges

1. **Low Adoption:** Some customers may hesitate to use the wallet due to lack of digital knowledge.
2. **Security Risk:** There is a risk of hacking, fraud, or misuse of personal information.
3. **Technical Issues:** System errors or internet problems may interrupt transactions.

Trust Strategies

1. **Strong Security:** The bank should use encryption and two-factor authentication to protect accounts.
2. **Customer Education:** Training and awareness programs can increase confidence in using the wallet.
3. **Quick Support:** Fast customer service and transaction alerts build long-term trust and loyalty.

Q-09. What are the services a MFS operator provides in Bangladesh? Name 5 most used e-services which approximate number of transactions through each of the services held in Feb, 2022.

Mobile Financial Services (MFS) operators in Bangladesh offer a wide range of services aimed at financial inclusion and convenience. The five most commonly used services are:

1. **Cash-In:** Allows users to deposit money into their mobile wallets. This is the most basic and frequently used service with millions of transactions daily.
2. **Cash-Out:** Enables users to withdraw money from their mobile wallet, also with millions of daily transactions.
3. **Person-to-Person (P2P) Transfers:** Facilitates money transfers between individuals. This service often records hundreds of thousands of transactions daily.
4. **Bill Payments:** Used for utility bills, school fees, and other payments, with tens of thousands of transactions daily.
5. **Mobile Recharge:** Allows users to buy mobile airtime. This service also sees tens of thousands of transactions daily.

Please note that the number of transactions is approximate and can vary.

Q-10. As per the MFS policy, how much share a bank shall hold in the MFS?

According to the MFS (Mobile Financial Services) policy of Bangladesh Bank, a bank must hold a majority ownership in the MFS. Specifically, as per the guidelines, a scheduled bank must own at least 51% (majority) share in an MFS platform or subsidiary, ensuring that the bank has a controlling interest. This regulation was put in place to ensure that banks maintain significant control and responsibility over the mobile financial services being offered, ensuring the stability and security of the service. It's part of Bangladesh Bank's broader effort to ensure that while MFS platforms offer financial inclusivity and accessibility, they also maintain the integrity and trustworthiness expected from more traditional banking institutions.

Q-11. Mobile financial services offer convenience and accessibility. Devise a strategy to design a user-centric mobile app that integrates banking, payments and remittance services. Discuss how the app can cater to diverse user-demographics and used to foster financial inclusion. BPE-97th.

User-Centric Mobile App Strategy for Financial Inclusion:

1. **Intuitive Interface:** Design a user-friendly interface ensuring easy navigation for diverse users, including those with limited technological exposure.
2. **Multilingual Support:** Incorporate multilingual capabilities to cater to users from diverse linguistic backgrounds, promoting inclusivity.
3. **Accessibility Features:** Implement accessibility features for users with disabilities, ensuring the app is usable by a wide range of individuals.
4. **Educational Content:** Provide educational content within the app to guide users on banking, payments, and remittance services, enhancing financial literacy.
5. **Flexible Account Options:** Offer various account options, accommodating both the unbanked and underbanked populations, promoting financial inclusion.
6. **Low Transaction Costs:** Keep transaction costs minimal to make services affordable for users with varying income levels.
7. **Customer Support:** Establish robust customer support to assist users and address queries promptly, fostering a sense of reliability.

8. **Collaborations with Local Agents:** Form partnerships with local agents to facilitate cash-in/cash-out services, bridging the digital divide.

This user-centric app strategy ensures accessibility, education, and affordability, making mobile financial services inclusive and empowering diverse user demographics.

Q-12. In relation to e-commerce, define the following: Cart, Payment gateway, Acquiring and Issuing Bank, PIN, CVV, CVC, Payment Association, Authorization, Settlement, Nostro account, NPSB.

In the context of e-commerce, these terms have specific meanings:

1. **Cart:** The virtual "basket" where customers place items they intend to purchase online.
2. **Payment Gateway:** A service that processes online payments, securely transmitting information between the website and the bank.
3. **Acquiring Bank:** The bank that processes credit/debit card payments for merchants.
4. **Issuing Bank:** The bank that issued the customer's credit/debit card.
5. **PIN:** Personal Identification Number, a secure code used to authenticate transactions.
6. **CVV/CVC:** Card Verification Value/Code, a 3 or 4-digit number on the card used for additional security.
7. **Payment Association:** Organizations like Visa, MasterCard that set the rules for card transactions.
8. **Authorization:** The process of checking if a card has enough funds for a transaction.
9. **Settlement:** The actual transfer of funds from the buyer's to the seller's account.
10. **Nostro Account:** A foreign currency account a bank holds in another bank.
11. **NPSB:** National Payment Switch Bangladesh, facilitates inter-bank electronic transactions in Bangladesh.

These terms are crucial for understanding how online transactions work, from selection to payment and fund transfer.

Q-13. Describe process flow of payment in ecommerce.

In e-commerce, the payment process usually follows these steps:

1. **Add to Cart:** The customer selects items and adds them to their online shopping cart.
2. **Checkout:** The customer proceeds to the checkout page, enters shipping information, and selects a payment method.
3. **Payment Gateway:** The transaction details are sent through a secure payment gateway for verification.
4. **Authorization:** The issuing bank checks if the customer's account has sufficient funds. If yes, it authorizes the transaction and sends an authorization code back through the payment gateway.
5. **Confirmation:** Once authorized, a confirmation message appears on the merchant's site, and an invoice is generated. The customer may also receive a confirmation email.
6. **Settlement:** At the end of the day, the acquiring bank settles all authorized transactions, transferring the money to the merchant's account.

7. **Shipping:** Once the payment is cleared, the products are prepared for shipping. This streamlined process enables secure and efficient online shopping, benefitting both consumers and merchants.

Q-14. Describe settlement process for ecommerce transactions. BPE-98th.

In e-commerce, the settlement process is the final stage where the actual transfer of funds takes place from the customer's bank account to the merchant's bank account. Here's how it generally works:

1. **Batching:** After transactions are authorized throughout the day, they are grouped together in a batch by the merchant or payment gateway.
2. **Submission:** The batch is then submitted to the acquiring bank, which forwards it to the appropriate payment association like Visa or MasterCard for further processing.
3. **Clearing:** The payment association sorts the transactions and sends them to the respective issuing banks for debiting the customer accounts.
4. **Fund Transfer:** Once the issuing banks confirm the transactions, the acquiring bank receives the funds.
5. **Merchant Payout:** Finally, the acquiring bank deposits the total amount, minus any transaction fees, into the merchant's bank account.

This process ensures that the merchant gets paid for their goods or services and typically takes 2-3 business days to complete.

Q-15. What is computer? Describe different types of computers based on capacity/size and type/performances.

Or, Describe the classification of computers on the basis of construction and working principles.

Or, Describe the types of computers based on job nature, size and capacity. BPE-97th.

A computer is an electronic device that processes data based on a set of instructions, performing tasks like calculations, data storage, and internet browsing.

Based on capacity/size, computers can be classified into:

1. **Supercomputers:** These are the most powerful, used for complex simulations and data analysis. Example: Weather forecasting.
2. **Mainframe Computers:** Used by large organizations for critical applications, capable of handling multiple tasks and high volumes of data.
3. **Minicomputers:** Smaller than mainframes but still powerful, often used for specific tasks in medium-sized companies.
4. **Microcomputers:** Personal computers like desktops, laptops, and tablets fall into this category. Suitable for individual use or small businesses.

Based on type/performance, they can be:

1. **Analog Computers:** Used for tasks where data can vary continuously, like controlling temperature.
2. **Digital Computers:** Most common, designed to perform calculations and tasks by manipulating discrete numbers.
3. **Hybrid Computers:** Combine features of both analog and digital computers.

Each type has its own working principle and construction based on its intended use.

Q-16. Discuss the main features of different generations of computers.

Computers have evolved through various generations, each with distinct features:

1. **First Generation (1940-1956):** Used vacuum tubes and were very large. They were slow, consumed a lot of power, and produced heat. Mainly used for scientific calculations.
2. **Second Generation (1956-1963):** Replaced vacuum tubes with transistors, reducing size and power consumption. Assembly language and early forms of operating systems emerged.
3. **Third Generation (1964-1971):** Introduced integrated circuits, replacing transistors. Smaller, faster, and more reliable, they used high-level languages like FORTRAN and COBOL.
4. **Fourth Generation (1971-Present):** Utilized microprocessors, leading to personal computers. This era saw the rise of graphical interfaces and the internet.
5. **Fifth Generation (Present and Beyond):** Focuses on artificial intelligence and natural language processing. Supercomputers and quantum computing are leading developments.

Each generation brought technological advancements that made computers more efficient, compact, and user-friendly.

Q-17. Different types of computers are Analog, Digital and Hybrid. Describe each of them.

Analog, digital, and hybrid computers serve different purposes and work on distinct principles:

1. **Analog Computers:** These are designed to handle continuously varying data. Unlike digital computers, which manipulate discrete numbers, analog computers perform calculations using physical quantities like voltage, pressure, or temperature. Commonly used in engineering and scientific applications such as weather forecasting and control systems.
2. **Digital Computers:** The most common type, digital computers operate on discrete data, manipulating it into useful information. They use binary language (0s and 1s) and are highly versatile, capable of performing calculations, word processing, internet browsing, and more. Personal computers, laptops, and mainframes are examples.
3. **Hybrid Computers:** These combine features of both analog and digital computers. Hybrid computers can process both continuous and discrete data. Often used in specialized applications like healthcare for monitoring heart rates (analog data) while also performing digital computations for diagnostics.

Each type has its own advantages and disadvantages, but digital computers are most prevalent due to their versatility and efficiency.

Q-18. Why micro computers are also called as PC?

Microcomputers are often referred to as Personal Computers (PCs) because they are designed for individual use, unlike larger computers like mainframes and supercomputers, which are intended for organizational or specialized applications. The term "PC" encapsulates the essence of a microcomputer's purpose: a compact, affordable, and versatile machine that can be personalized to the user's specific needs.

In the early days of computing, the notion of having a computer in one's home was groundbreaking, and the term "Personal Computer" highlighted this individual accessibility. Microcomputers or PCs made computing accessible to the general public,

fulfilling a range of functions from word processing, internet browsing, gaming, to basic data analysis. Their relatively lower cost and user-friendly interface make them ideal for personal or small business use. Therefore, the terms "microcomputer" and "PC" are often used interchangeably.

Q-19. What are the main features of laptop computer?

Laptops are known for their portability and versatility. Here are their main features:

1. **Portability:** Compact design and built-in battery make it easy to carry and use anywhere.
2. **Performance:** Modern laptops offer processing speeds and storage comparable to desktop computers, suitable for a range of tasks from browsing to heavy-duty computing.
3. **Integrated Peripherals:** Built-in webcam, speakers, microphone, and touchpad eliminate the need for external devices for basic tasks.
4. **Connectivity:** Equipped with Wi-Fi, Bluetooth, and multiple ports like USB and HDMI for connecting to various devices and networks.
5. **Energy Efficiency:** Designed to consume less power than desktops, extending battery life.
6. **Flexibility:** Many laptops now offer touchscreen capabilities or 2-in-1 functionality, allowing them to function as tablets as well.

Laptops are ideal for those needing a balance of functionality and mobility.

Q-20. Discuss the functions of CPU and main memory. BPE-96th.

The Central Processing Unit (CPU) serves as the brain of a computer, executing instructions and coordinating data processing tasks. It performs functions such as arithmetic calculations, logical comparisons, and managing data flow between various components. The CPU interprets instructions from programs and controls the overall execution of tasks.

Main memory, typically RAM (Random Access Memory), acts as a temporary storage area for data and instructions actively used by the CPU. It enables quick access to information, facilitating faster data retrieval and manipulation. Main memory is crucial for the execution of programs and tasks, providing the CPU with the necessary data and instructions for efficient processing.

Q-21. What is computer memory? Briefly discuss different types of computer memory?

Or, Describe Primary and Secondary Memory with example.

Or, What are the differences between main memory and auxiliary memory? What happens when the RAM of a computer is destroyed? BPE-5th.

Or, What is Secondary Memory.

Computer memory serves as the storage area where data and instructions are kept either temporarily or permanently for processing. It can be classified into two main types:

1. **Primary Memory:** Also known as Main Memory or RAM (Random Access Memory), this is where data and instructions are temporarily stored for quick access by the CPU. Being volatile, it loses its content when the computer is turned off. Examples include RAM and ROM (Read-Only Memory).

2. **Secondary Memory:** This is non-volatile storage that retains data even when the computer is off. It's used for long-term storage of data and is slower compared to primary memory. Examples include Hard Disk Drives (HDD), Solid State Drives (SSD), and external storage devices like USB drives.

Differences between Main and Auxiliary (Secondary) Memory:

- Main memory is faster but volatile, while secondary memory is slower but non-volatile.
- Main memory is generally more expensive per unit of storage.
- Main memory directly interacts with the CPU, while secondary memory does not.

Understanding these types of memory helps in appreciating how data storage and access are managed in a computer system.

When the RAM (Random Access Memory) of a computer is destroyed: The computer cannot function properly. RAM is used to store data and programs temporarily while the computer is running. If RAM is not working, the computer may fail to start, show error messages, freeze, or restart repeatedly. It cannot load the operating system or open files because there is no place to store active data. You may hear beeping sounds or see a blank screen during startup. Without working RAM, the processor cannot access necessary data quickly, and the computer becomes unusable until the RAM is repaired or replaced. RAM is essential for the computer's speed and smooth operation.

Q-22. What is Cache memory? BPE-96th.

Cache memory is a small, fast type of volatile computer memory that provides high-speed data access to the processor and improves the speed and performance of the computer. It acts as a buffer between the CPU and the main memory (RAM). When the CPU needs to access data, it first checks whether the data is in the cache. If the required data is found in the cache (this is called a cache hit), it skips accessing the slower main memory. Cache memory is faster but also more expensive than main RAM, so computers usually have a limited amount of cache. It's designed to temporarily store copies of frequently accessed data, making data retrieval faster and more efficient.

Q-23. What do you understand by storage devices? Name various storage devices.

Storage devices are hardware components used to save, store, and retrieve data. They allow users to keep data long-term, either for backup, transfer, or archival purposes. Data stored on these devices can be retrieved even after the computer is turned off, as they offer non-volatile storage.

Various storage devices include:

1. **Hard Disk Drives (HDD):** Magnetic storage devices used as the primary storage in computers.
2. **Solid State Drives (SSD):** Faster than HDDs, they use flash memory and have no moving parts.
3. **Optical Drives:** Devices like CD, DVD, and Blu-ray drives.
4. **USB Flash Drives:** Portable devices for data transfer.
5. **Memory Cards:** Used in cameras, phones, and other handheld devices.
6. **External Hard Drives:** HDDs or SSDs in external cases, connected via USB or other ports.

Each storage device varies in capacity, speed, and functionality.

Q-24. What are the differences amongst Dot, Jet and Laser printers?

Dot Matrix, Inkjet, and Laser printers serve the same basic function—printing—but they do so in very different ways:

1. **Dot Matrix Printers:** These are old-school printers that use pins striking against an ink ribbon to form characters. They are noisy, slow, and offer lower quality but are very durable and can print multi-page forms.
2. **Inkjet Printers:** These printers spray tiny droplets of ink onto paper, providing high-quality text and images. They are relatively inexpensive but the cost of ink can add up.
3. **Laser Printers:** These use a laser beam to transfer an image onto a drum, which then transfers toner onto paper. They offer the highest print quality and speed among the three and are more cost-effective for high-volume printing.

Each type has its advantages and disadvantages, largely dictated by what you need to print.

Q-25. What are the main functions of RAM, BIOS and Hard disk?

1. **RAM (Random Access Memory):** RAM serves as the computer's "working" memory, temporarily storing data and instructions for quick access by the CPU while the computer is on. It's volatile, meaning it loses its contents when the system is turned off. It's essential for multitasking and running complex applications.
2. **BIOS (Basic Input/Output System):** BIOS is the firmware that initializes and tests hardware components during boot-up and facilitates communication between the operating system and hardware. It's stored on a chip on the motherboard and is non-volatile, retaining its information even when powered off.
3. **Hard Disk:** The hard disk is a non-volatile storage device used for long-term data storage. It houses the operating system, software applications, and user files. Unlike RAM, the data remains even when the computer is turned off, making it crucial for preserving important information.

Each of these components plays a unique role in the computer's operation.

Q-26. What do you understand by BIOS and discuss about its role in using a computer.

BIOS, which stands for Basic Input/Output System, is the foundational firmware of a computer, embedded on a chip on the motherboard. It initializes and tests the system hardware components during the boot-up process before handing over control to the operating system.

Role in using a computer:

1. **Initialization:** Upon powering on, BIOS starts the POST (Power-On Self-Test) to ensure all hardware components are functional.
2. **Boot Sequence:** It determines which devices (e.g., hard drive, USB, CD-ROM) the computer will try to boot from.
3. **Hardware Configuration:** Using the BIOS setup utility, users can modify hardware settings, such as system clock or boot order.
4. **OS Handoff:** Once hardware checks are complete, BIOS locates the bootable device and hands over control to the operating system.

In essence, BIOS acts as a bridge between the computer's hardware and software, ensuring they work in harmony.

Q-27. Give a comparative discussion on Hard drive and Pen drive.

Or, Give a comparative discussion on floppy drive, hard drive and pen drive.

Or, What are differences among Floppy disk, Hard disk, CD and Pen drive?

1. **Hard Drive:** Typically internal and used for primary storage, hard drives offer larger capacity (up to multiple terabytes) and are generally faster but less portable. They use magnetic storage and contain spinning disks.
2. **Pen Drive:** Also known as a USB flash drive, it's smaller, portable, and used for transferring files. Capacity ranges from a few GBs to 1TB. It uses flash memory and has no moving parts, making it durable.
3. **Floppy Drive:** Outdated but once a standard, these offer limited storage (1.44 MB in 3.5-inch disks) and slow speeds. Like hard drives, they use magnetic storage but are far less reliable and efficient.

Comparisons:

- **Portability:** Pen drives win, hard drives are semi-portable, and floppy drives are mostly obsolete.
- **Capacity:** Hard drives offer the most storage, followed by pen drives and then floppy drives.
- **Speed:** Hard drives are generally faster, with pen drives being variable and floppy drives being the slowest.
- **Durability:** Pen drives are most durable due to no moving parts, followed by hard drives and floppy drives.

Each has its advantages and drawbacks, tailored for specific needs and applications.

Q-28. What is microprocessor? What do you mean by Intel dual core 2.4 GHz?

A **microprocessor** is an integrated circuit that performs the functions of a CPU on a single chip. It executes instructions, performs calculations, and manages data, essentially serving as the "brain" of a computer or other electronic device.

"Intel Dual Core 2.4 GHz" refers to a specific type of microprocessor made by Intel. Here's what each part means:

- **Intel:** The manufacturer of the chip.
- **Dual Core:** Indicates the processor has two cores, essentially like having two microprocessors in one. This allows for better multitasking and improved performance for certain applications.
- **2.4 GHz:** Stands for gigahertz, which is a unit of frequency. It indicates the speed at which the processor can execute instructions. In this case, 2.4 billion cycles per second.

So, an Intel Dual Core 2.4 GHz processor is a two-core chip from Intel that operates at a speed of 2.4 GHz.

Q-29. What is an operating system? Describe the major functions of operating system.

Or, Name operating system for microcomputer and mobile.

Or, What are the functionalities of an operating system?

An **operating system (OS)** is software that acts as an intermediary between computer hardware and the computer user. It provides a user-friendly environment and controls the computer hardware so that software applications can function.

Major functions of an operating system:

1. **Process Management:** Handles the creation, scheduling, and termination of processes.

2. **Memory Management:** Manages the computer's RAM, including allocation to running programs.
3. **File System Management:** Organizes, stores, retrieves, and manages files on storage devices.
4. **Security:** Protects information against unauthorized access and potential threats.
5. **I/O System Management:** Manages input and output devices like keyboards and printers.
6. **User Interface:** Provides an interface, either command-line or graphical, for users to interact with the computer.

For **microcomputers**, popular OSs include Microsoft Windows, macOS, and Linux. For **mobile devices**, prominent OSs are Android and iOS.

Q-30. Define software and hardware with example? BPE-96th.

Hardware refers to the physical components of a computer system that you can touch and feel. These components work together to run the computer and execute software commands.

Example:

CPU (Central Processing Unit), hard drive, keyboard, mouse, monitor, RAM (Random Access Memory).

Software, on the other hand, consists of sets of instructions that tell the hardware what to do. Unlike hardware, you can't physically touch software, but you interact with it during computing tasks.

Example:

Operating Systems like Windows or macOS, applications like Microsoft Word or Photoshop, and utility programs like antivirus software.

In essence, hardware provides the physical capabilities of a computing system, while software provides the instructions and applications needed to execute tasks and provide functionality. Both are essential for a computer system to operate effectively.

Q-31. What are the computer hardware and devices? Describe the ROM with its characteristics. BPE-97th.

Computer hardware means the physical parts of a computer that can be seen and touched. It includes all mechanical and electronic components that help the computer work.

Computer devices are hardware units used for specific purposes such as input, processing, output, and storage.

Main types:

- **Input devices:** Keyboard, Mouse, Scanner.
- **Output devices:** Monitor, Printer, Speaker.
- **Processing device:** CPU.
- **Storage devices:** Hard Disk, Pen Drive.

These hardware and devices work together to receive data, process it, and produce results.

ROM (Read Only Memory)

ROM (Read Only Memory) is a type of primary memory that stores permanent instructions of a computer. It mainly keeps the program required to start the computer.

Characteristics of ROM:

1. **Non-Volatile Memory:** ROM keeps data permanently and does not lose information when the power is turned off.

2. **Read-Only Access:** The stored data cannot be easily changed or edited by the user.
3. **Boot Program Storage:** ROM stores the BIOS or firmware that helps the computer start.
4. **Permanent Storage:** The information in ROM remains fixed and stable for a long time.
5. **Start-up Support:** ROM helps the computer begin its initial operating process properly.

Q-32. What is a mother board?

A **motherboard** is the main circuit board inside a computer that acts as the central hub connecting all other components. It holds the CPU (Central Processing Unit), RAM (Random Access Memory), storage interfaces for hard drives or SSDs, expansion slots for additional hardware like graphics cards, and ports for external devices like keyboards and mice. The motherboard also includes various chips and controllers to manage data transfers between these components. It provides the electrical pathways that enable components to communicate with each other. Essentially, the motherboard is the backbone of a computer, coordinating how all other parts work together.

Q-33. Why an UPS is used with a computer?

An UPS, or Uninterruptible Power Supply, is used with a computer to keep it running when there's a power outage. Imagine you're working on something important and suddenly the electricity goes off. Without an UPS, you'd lose all your unsaved work and the computer could even get damaged. The UPS gives you extra time to save your work and shut down the computer properly. It also helps protect against power surges, which can harm your computer's components. So, using an UPS is like having a safety net for your computer and your data when power issues happen.

Q-34. What does CPU stand for? What is its use in computer?

"CPU" stands for "Central Processing Unit." It's often called the "brain" of the computer because it's responsible for carrying out instructions from software.

When you run a program, play a game, or even just move your mouse, the CPU is working to process those actions. Every task, big or small, gets broken down into a series of instructions, and the CPU processes them at lightning-fast speeds. So, if the computer was a person, the CPU would be its thinker, making decisions and getting things done based on the instructions it receives from the software you're using

Q-35. Narrate characteristics of each of the Main, Cache and Secondary memory.

1. Main Memory (RAM)

- RAM stands for Random Access Memory. It's like the computer's workbench where it keeps all the things it's currently using or working on. When you open an app, it's loaded into RAM so it works faster. But, when you turn off the computer, everything in RAM goes away.

2. Cache Memory

- Cache is even faster than RAM but much smaller. It's like the computer's pocket where it keeps really important stuff it needs all the time, so it doesn't have to go looking for it. Cache helps make the CPU work faster by storing bits of data it uses a lot.

3. Secondary Memory

- This is where your computer stores things when it's not using them, like your photos, music, and programs. Examples are hard drives and SSDs (Solid State Drives). Even when you turn off the computer, the stuff in secondary memory stays there.

Each type of memory serves a unique role to make your computer fast and efficient!

Q-36. What are CISC and RISC processors? Which processor is used in a high-end IBM server?

1. CISC Processor

- CISC stands for Complex Instruction Set Computer. It's a type of processor that can do lots of complicated tasks in just one instruction. This makes it easier to program but can sometimes be slower because each instruction can do a lot.

2. RISC Processor

- RISC stands for Reduced Instruction Set Computer. Unlike CISC, RISC does simpler tasks, but it does them super-fast. Each instruction does only one thing, so it can process them really quickly.

High-End IBM Server

- In high-end IBM servers, you'll often find RISC processors. These processors are usually more efficient and faster for server tasks. They're designed to handle a lot of simple tasks quickly, which is really useful for servers that have to manage a lot of data and connections at the same time.

Q-37. Discuss about the following: (i) Cheque sorting and balancing system (ii) Document storage and retrieval systems.

1. Cheque Sorting and Balancing System

- Imagine you work in a bank and get hundreds of cheques every day. You need to sort them by account number, bank branch, or some other rule. A cheque sorting system does this automatically, way faster than a human. Then, it checks ("balances") to make sure all the money adds up right, so there are no mistakes.

2. Document Storage and Retrieval Systems

- Think of a big, digital filing cabinet that holds tons of documents. You can put things in it like reports, contracts, or letters. When you need one later, you just type in what you're looking for, and it finds it for you instantly. It's way easier than digging through stacks of paper.

Both systems make life easier and more organized, especially in places like offices and banks.

Q-38. What is Computer Software? Describe different types of software. Define functionality, usability and examples of system software and application software? BPE-98th.

Or, Describe the functions of various software mentioned below-Operating system, Application software.

Or, Define system software and application software with examples and their application. BPE-96th. BPE-98th.

1. Operating System (System Software)

- Think of this as the "boss" of your computer. It helps all the parts of your computer work together. Examples include Windows, macOS, and Linux. It wakes up the computer, manages files, and lets you run other software.

2. Application Software

- These are programs that let you do specific things on your computer, like writing a document or playing a game. Examples are Microsoft Word for writing and Photoshop for photo editing. You use these to get stuff done or have fun.

Functionality, Usability, and Examples

□ System Software:

- **Functionality:** Manages hardware resources and serves as a platform for application software.
- **Usability:** Enables basic operations like file management, multitasking, and hardware communication.
- **Examples:** Operating systems (Windows, Linux), utilities (antivirus, disk management).

□ Application Software:

- **Functionality:** Performs specific tasks based on user requirements, such as editing documents or managing data.
- **Usability:** Provides an interface for tasks like word processing, spreadsheets, or graphic design.
- **Examples:** Microsoft Word, Excel, Photoshop, web browsers.

Q-39. What is API? BPE-98th.

API stands for Application Programming Interface. Imagine you have two different apps or software and you want them to talk to each other. An API is like a translator that helps them understand what the other is saying. It's a set of rules and tools that lets one piece of software ask another to do something. For example, when you book a flight through a travel app, the app uses an API to get information from the airline's system to show you flight times and prices. So, an API helps different software programs work together to make things easier for you!

Q-40. Briefly discuss about the functionalities of a modern core banking software.

Or, what are the main features of the modern core banking software?

Or, Discuss about the functions of a modern core banking software.

Modern core banking software is like the brain of a bank, running on computers. Here's what it can do:

1. **Account Management:** Helps you open, close, and manage your accounts like savings or checking.
2. **Money Transfer:** Lets you move money between accounts or send to other people easily.
3. **Loan Processing:** Helps you apply for loans and tracks all the details.
4. **ATM and Card Services:** Manages everything about your debit or credit card, like pin changes.
5. **Online Banking:** Allows you to check your account and pay bills from your phone or computer.

So, it makes everything at the bank work smoothly, letting you handle your money without a headache!

Q-41. Name 2 core banking software?

Or, Name four core banking software being used in Bangladesh banking sector?

Temenos T24: This is a popular core banking software used by some banks in Bangladesh. It handles things like account management, loans, and online banking.

1. **Infosys Finacle:** Another commonly used software in Bangladesh. It also does stuff like managing your accounts, helping you get loans, and making online banking easy.
2. **Oracle FLEXCUBE:** This one is used for all kinds of banking services, from basic account stuff to more complex financial products.
3. **SAP for Banking:** This software helps banks manage their business, including customer accounts and financial products.

These software help banks in Bangladesh run smoothly, making it easier for people to manage their money.

Q-42. Compare functionalities of Core Banking Software and MFS software. BPE-97th.

Core Banking Software:

1. **Comprehensive Banking Operations:** Manages traditional banking functions like deposits, loans, and transactions.
2. **Account Management:** Handles customer accounts, ensuring accuracy and security.
3. **Integrated Platform:** Centralized system connecting branches for seamless banking operations.
4. **Compliance and Reporting:** Ensures adherence to banking regulations and generates financial reports.

Mobile Financial Services (MFS) Software:

1. **Digital Transactions:** Facilitates mobile-based financial transactions like payments and fund transfers.
2. **Wallet Management:** Manages digital wallets for users to store and transact money.
3. **Financial Inclusion:** Targets unbanked populations, providing access to basic financial services via mobile devices.
4. **Quick and Convenient:** Emphasizes speed and accessibility, enabling users to perform transactions anytime, anywhere.

Q-43. Briefly discuss about the backup strategy of a core banking system?

A **backup strategy** for a core banking system is like having a "safety net" for all the bank's important data. Imagine if something bad happens, like a computer crash or a power outage. The bank doesn't want to lose all the information about customers' money, loans, and accounts. So, they regularly make extra copies of all this data and store it in a secure place, sometimes even in multiple places. Some backups happen every night, and some even happen in real-time as changes are made. This way, if something goes wrong, the bank can use the backup to get everything back to normal quickly.

Q-44. What do you understand by ERP software? Briefly discuss the modules of ERP software which are used in the financial industry. BPE-5th.

Or, briefly discuss about the following: ERP software.

ERP stands for Enterprise Resource Planning. Think of it like the control center for a business. It's a software that helps a company manage all its different jobs in one place. Whether it's tracking sales, keeping an eye on inventory, managing employees, or handling customer orders, ERP brings it all together. Instead of using different software for different tasks, a company can use ERP to see and manage everything from one dashboard. This makes running a business smoother and helps everyone stay on the same page. So, ERP is like an all-in-one tool for managing a company.

ERP (Enterprise Resource Planning) software in the financial industry includes different modules that help manage operations smoothly.

Key modules are:

1. **Accounting Module:** Manages general ledger, income, expenses, and financial reporting.
2. **HR and Payroll Module:** Handles employee records, attendance, salary, and tax calculations.
3. **Customer Relationship Management (CRM):** Maintains customer data and helps improve service.
4. **Loan and Deposit Module:** Tracks loan disbursements, repayments, and deposit schemes.
5. **Inventory Management:** Manages stationery, documents, and IT equipment stocks.
6. **Compliance and Audit:** Ensures internal control and regulatory reporting.

These modules work together in one system, improving accuracy, reducing manual work, and supporting better decision-making.

Q-45. Modern banks and FIs are embracing Enterprise Resource Planning (ERP) systems to streamline operations. Propose a strategy for implementing an integrated banking ERP system that covers core banking functions, HR management and inventory control where data synchronization, training and customization challenges are addressed. How this system can improve data accuracy, decision making and operational efficiency. BPE-97th.

Strategy for Implementing Integrated Banking ERP System

1. **Needs Assessment:** Identify requirements for core banking, HR management, and inventory control.
2. **Vendor Selection:** Choose an experienced ERP provider with strong security and regulatory compliance features.
3. **Phased Implementation:** Introduce the system step by step to reduce operational risk.
4. **Data Synchronization:** Create a centralized database with standard data formats for real-time information sharing.
5. **Data Migration and Validation:** Ensure accurate transfer of existing data into the new system.
6. **Training Program:** Provide staff training and user guidelines to improve adoption.
7. **Customization Control:** Customize only essential features to meet regulatory and operational needs.

Benefits of the ERP System

1. **Improved Data Accuracy:** Reduces duplication and manual errors.
2. **Better Decision Making:** Provides real-time reports and management dashboards.
3. **Higher Operational Efficiency:** Automates processes and improves coordination across departments.

Q-46. What benefits banks may gain by using Data warehouse, Data mining and Business intelligence software?

1. **Data Warehouse:** Think of this like a big, organized closet where banks store all kinds of information. It makes it easier to find what they need later.
2. **Data Mining:** This is like having a smart detective who can quickly go through that closet and find useful clues. Banks can figure out what customers like or dislike, and maybe even spot fraud.
3. **Business Intelligence Software:** Imagine a wise advisor that takes those clues and helps make smart decisions. This software helps banks understand trends and make plans for the future.

So, with these tools, banks can better understand their customers, make smarter choices, and keep everything running smoothly.

Q-47. Describe the stages of software development life-cycle.

Making software is like building a house, and it goes through different stages:

1. **Planning:** Before you build, you need a plan. Decide what the software should do and how to make it.
2. **Design:** Now draw a blueprint. Decide how each part will work and how they will connect.
3. **Development:** Time to build! Programmers write the code to make the software work.
4. **Testing:** Before you move in, you check for leaks and cracks. In software, this means finding and fixing bugs.
5. **Deployment:** The software is now ready to be used by people. Install it on computers or make it available for download.
6. **Maintenance:** Just like a house, software needs upkeep. Keep fixing bugs and making improvements.

That's how software goes from an idea to something we can use.

Q-48. How Internet Banking works?

Internet banking is like a bank branch you can visit without leaving home. It works through a website or an app on your phone. First, you need to set up your online account with your bank. They'll give you a username and password to log in securely. Once you're in, you can do lots of things: check your balance, pay bills, transfer money, and more. All you need is an internet connection. It's like having a mini-bank right in your pocket or on your computer. And don't worry, it's usually very secure; banks use special technology to keep your money and info safe.

Q-49. Name five input devices and 3 output devices. Describe printer, keyboard and mouse.

Input Devices:

1. Keyboard
2. Mouse

3. Touchscreen
4. Microphone
5. Scanner

Output Devices:

1. Monitor
2. Printer
3. Speaker

Keyboard: It's like a typewriter for your computer. You press keys to type words, numbers, or symbols. It's how you chat with friends online or write emails.

Mouse: A small gadget you move around to control a pointer on your screen. You click on things to open them or make choices.

Printer: Think of it as a machine that takes what's on your screen and puts it on paper. Whether it's a picture or a document, the printer makes it real.

Input devices let you tell the computer what to do, and output devices show you what the computer has done.

Q-50. Can a customer receive cash from Internet Banking? Why?

No, you can't directly receive cash from Internet Banking. Think of Internet Banking like a remote control for your bank account. You can move money around, pay bills, and check your balance, but it can't physically hand you cash. For that, you have to visit an ATM or go to a bank branch. Internet Banking is just a tool to manage your money online, but it can't do things that require physical actions like giving you cash. So, if you need cash in hand, you'll have to step out and get it the traditional way.

Q-51. What banking activities a customer can perform using Internet Banking?

With Internet Banking, you can do a bunch of banking stuff without going to the branch. You can:

1. **Check Balance:** See how much money you've got in your account.
2. **Pay Bills:** No more standing in lines. Pay your electricity, phone, or other bills online.
3. **Transfer Money:** Send money to friends, family, or even to another one of your accounts.
4. **View Statements:** Look at your past transactions, like what you spent and received.
5. **Order Checks:** Need new checks? Order them without a call or visit to the bank.

So, you get to do a lot of your regular banking tasks right from your couch.

Q-52. Why a database is used along with a program?

A **database** is used with a program to organize and store data in a way that makes it easy to access, manage, and update. Think of a program like a chef and the database as the pantry. The chef can quickly find ingredients (data) from the pantry (database) to make a meal (perform a task). Whether it's customer details for a business, scores in a game, or patient records in a hospital, a database helps the program function efficiently. It allows for quick searches, keeps the data secure, and can handle a lot of information at once. So, a database makes a program more powerful and useful.

Q-53. Describe the following: a) DBA, b) Backup c) Database Management System

a) DBA (Database Administrator): A DBA is like a librarian for databases. They set up, manage, and keep the database running smoothly. They're in charge of security, performance, and making sure data is always available.

b) Backup: This is a copy of your data stored in a separate location. Think of it like a spare key to your house. If something bad happens to your main database, like data loss or corruption, you can restore the data from the backup.

c) Database Management System (DBMS): This is the software that manages databases. It helps you create, read, update, and delete data. It's like the operating system for your database, providing tools to interact with the data easily.

Q-54. Define the followings: a) Internet, b) IP, c) DNS, d) Hyperlink, e) URL, f) email. BPE-98th

a) Internet: A global network of computers that can communicate with each other. Think of it as a giant web where you can find information, talk to people, or watch videos.

b) IP (Internet Protocol): It's like the street address for your computer on the Internet. It helps to route data to the right place.

c) DNS (Domain Name System): It translates human-friendly website names like "google.com" into IP addresses that computers understand.

d) Hyperlink: A clickable piece of text or image on a webpage that takes you to another page or file. It's like a door to another room on the Internet.

e) URL (Uniform Resource Locator): The full web address you type into your browser to visit a website, like "<https://www.google.com>".

f) Email (Electronic Mail): A way to send and receive messages through the Internet. It's like digital postal mail but much faster.

Q-55. What is World Wide Web? What is the basic difference between www and Internet?

The **World Wide Web (WWW)** is a system of interlinked hypertext documents and multimedia content that can be accessed over the Internet using web browsers. It's a way to navigate the vast information available on the Internet.

The basic difference between WWW and the Internet is scope. The Internet is a global network of networks, enabling various forms of communication like email, file transfer, and more. The WWW is just one service on the Internet, specifically designed for browsing web pages. The Internet is the infrastructure, and the WWW is a service that runs on that infrastructure.

Q-56. What is meant by machine language? Distinguish between machine language, assembly language and high-level language.

Machine language is the lowest level of programming language, represented by binary codes that a computer's hardware can execute directly.

1. Machine Language:

- **What:** Series of binary codes (1s and 0s).
- **Usage:** Directly understood by computer hardware.
- **Example:** 101100001011.

2. Assembly Language:

- **What:** Uses symbolic instructions.
- **Usage:** Easier for humans to read than machine language, but requires an assembler to convert it into machine code.

- **Example:** MOV, ADD, JMP.
3. **High-Level Language:**
- **What:** Uses English-like syntax.
 - **Usage:** Easier for programmers to read and write. Requires compilers or interpreters to translate into machine code.
 - **Example:** Python, Java, C++.

Q-57. Describe the features of fourth generation languages. Name any two languages of others generation.

Fourth-generation languages (4GL) are designed to be closer to human language and simpler to use than traditional programming languages. They focus on specific tasks like database management or report generation. 4GLs often allow users to write programs using fewer lines of code and usually have built-in features to make common tasks easier.

Features:

1. **User-friendly:** Easier to learn and use.
2. **Task-specific:** Built for specialized jobs like querying databases.
3. **Less Coding:** Achieve results with fewer lines of code.
4. **Faster Development:** Quicker to write, test, and deploy programs.

Two languages:

1. **SQL (Structured Query Language)** - for database management.
2. **MATLAB** - used in scientific and engineering tasks.

Q-58. Describe the advantages and disadvantages of machine language.

Advantages of Machine Language:

1. **Speed:** It's the fastest because it's understood directly by the computer hardware.
2. **Efficiency:** Uses less memory and executes tasks without extra layers of translation.

Disadvantages of Machine Language:

1. **Hard to Use:** Writing in 1s and 0s is not user-friendly; very hard for humans to read or write.
2. **Error-Prone:** Easy to make mistakes, and debugging is difficult.
3. **Machine-Specific:** Code usually works only on the type of computer it was written for; not portable to other systems.

Q-59. What is the use case of DBMS in a bank? A bank has employees with information NAME, DESIGNATION, ID, SALARY. Draw a simple database table with example where ID is the primary key. BPE-96th.

A Database Management System (DBMS) in a bank efficiently manages vast amounts of data, ensuring secure, organized, and quick access to information. For instance, in employee management:

Database Table: Employee Information

ID	Name	Designation	Salary
101	John Smith	Manager	Tk. 60,000.00
102	Jane Doe	Analyst	Tk. 40,000.00
103	Mike Brown	Teller	Tk. 30,000.00

In this table, 'ID' serves as the primary key, uniquely identifying each employee. The DBMS allows efficient querying, updating, and retrieval of employee data, facilitating payroll processing, performance evaluation, and overall human resource management in the bank. The structured database ensures data integrity, security, and accessibility for various banking operations.

Q-60. Discuss about database management system and its use.

Or, what is database management system? Discuss about its usage?

A **Database Management System (DBMS)** is software that helps you store, organize, and manage data like customer information, product details, or employee records. It lets you easily add, update, or find data, and ensures it's secure and consistent.

Usage:

1. **Business:** Keep track of inventory, sales, and customer info.
2. **Schools:** Store student grades, attendance, and records.
3. **Healthcare:** Manage patient records and appointments.
4. **Websites:** Keep user accounts and preferences.

A DBMS is like a digital filing cabinet where you can easily and safely keep all kinds of information and find it when you need it.

Q-61. What are centralized and distributed database systems? Which one is better for banking operation and why?

Centralized Database System:

- All data is stored in a single, central location.
- Easier to manage and backup.

Distributed Database System:

- Data is spread across multiple locations or computers.
- Can be more resilient and closer to users.

Better for Banking: Centralized Database

- **Security:** Easier to implement high security in one central place.
- **Consistency:** Important for banking to make sure everyone sees the same data at the same time.
- **Ease of Management:** Easier to manage and maintain data integrity when it's all in one place.

Q-62. Discuss the benefits of database against flat file.

Database Benefits:

1. **Organization:** Easier to sort and find data.
2. **Multiple Users:** Many people can use it at the same time.
3. **Security:** Better control over who can see or change what.
4. **Flexibility:** Can handle complex queries and reports.

Flat File:

- It's like a simple text file or spreadsheet with no special features.

Why Database is Better: Think of a flat file like a single drawer of a filing cabinet, while a database is the whole cabinet with multiple drawers, locks, and labels. A database can hold more information in a more organized way, is safer, and lets more people use it easily.

Q-63. Define and describe, with examples, commonly used input, output, processing, and memory devices in an office environment. BPE-98th.

Commonly Used Devices in an Office Environment

Input Devices

- **Definition:** Devices used to enter data into a computer.
- **Examples:**
 - **Keyboard:** Used for typing text and commands.
 - **Mouse:** Used for navigating and selecting items on the screen.

Output Devices

- **Definition:** Devices that present data from a computer to the user.
- **Examples:**
 - **Monitor:** Displays visual output like documents and videos.
 - **Printer:** Produces hard copies of digital documents.

Processing Devices

- **Definition:** Components that interpret and execute instructions.
- **Examples:**
 - **CPU (Central Processing Unit):** The main processor that performs calculations and runs programs.
 - **GPU (Graphics Processing Unit):** Handles rendering of images and video.

Memory Devices

- **Definition:** Components that store data temporarily or permanently.
- **Examples:**
 - **RAM (Random Access Memory):** Temporary storage for active processes.
 - **Hard Drive/SSD:** Permanent storage for files and applications.

These devices facilitate efficient data handling and operations in an office setting.

Q-64. Centralized DBMS Software is widely used in the financial services industry but there are some associated risks of usage of this. What could be the alternative effective solution to overcome those risks? BPE-98th.

Centralized DBMS software, while efficient, carries risks such as single points of failure, security vulnerabilities, and scalability issues. To mitigate these risks, financial services can consider the following alternatives:

1. **Distributed Databases:**
 - Data is spread across multiple locations, reducing the risk of a single point of failure.
 - Enhances data availability and resilience.
2. **Cloud-Based Databases:**
 - Offers scalability and flexibility.
 - Providers offer robust security measures and backup solutions.
3. **Blockchain Technology:**
 - Ensures data integrity and security through decentralized ledgers.
 - Suitable for secure, transparent transactions.
4. **Hybrid Approaches:**
 - Combine on-premise and cloud solutions for balanced control and scalability.
 - Can tailor security and compliance measures.

These alternatives enhance reliability, security, and scalability, addressing the limitations of centralized DBMS in the financial industry.

Q-65. Is the Internet a blessing or a curse? Justify your answer. BPE-98th.

The Internet is predominantly a blessing, though it has some drawbacks.

Blessings:

1. **Information Access:** Provides vast, instant access to knowledge and educational resources.
2. **Communication:** Connects people globally through social media, email, and video calls.
3. **Economic Opportunities:** Enables e-commerce, remote work, and online banking.
4. **Innovation:** Drives technological advancements and creativity.

Curses:

1. **Privacy Issues:** Risk of data breaches and loss of personal information.
2. **Cybercrime:** Increases in hacking, scams, and online fraud.
3. **Addiction:** Potential for excessive use leading to mental health issues.
4. **Misinformation:** Spread of false information and fake news.

Overall, the Internet's benefits in enhancing connectivity, education, and economic growth outweigh its drawbacks, making it a powerful tool for progress.

Q-66. If any fraudulent activities happen in a banking system, describe the role of the Information System. BPE-98th.

In the event of fraudulent activities in a banking system, the Information System (IS) plays a critical role in several key aspects:

1. **Detection:** IS monitors transactions and account activities for anomalies or patterns indicative of fraud, using algorithms and AI to detect suspicious behavior.
2. **Alerting:** It promptly alerts relevant personnel or automated systems when potential fraud is detected, triggering immediate investigation and mitigation actions.
3. **Forensic Analysis:** IS aids in forensic analysis by providing detailed logs, transaction histories, and digital footprints necessary to reconstruct events and identify the perpetrators.
4. **Prevention:** IS implements security measures such as encryption, access controls, and anomaly detection to prevent unauthorized access and fraudulent activities in the first place.

Q-67. What are the different types of programming languages and their common uses?

A programming language is a tool used for writing general-purpose or application-specific programs. Large companies develop programming languages and sell them commercially to programmers. Programmers use these languages to create various software applications. Commonly used programming languages include C/C++, Java, Assembly language, COBOL, FORTRAN, BASIC, Visual Basic, .Net, HTML, and FoxPro.

These languages can be classified into three types:

- **Low-Level Languages:** Close to machine code, providing high performance and control over hardware.

- **High-Level Languages:** More abstract, easier to use, and closer to human language, such as Java and Python.
- **Object-Oriented Languages:** Focus on objects and data encapsulation, promoting code reusability, like C++ and Java.

These languages cater to different programming needs and preferences.

Q-68. Internet and internet related terminology?

Internet: The Internet is a global network of interconnected computer systems using the TCP/IP protocol to serve billions of users. It consists of various networks from private, public, academic, business, and government sectors, offering vast information resources and services like the World Wide Web (WWW) and email.

WWW: The World Wide Web (WWW) is an information system of interlinked hypertext documents accessible via the Internet. Developed by Sir Tim Berners-Lee, it allows users to view and navigate web pages through hyperlinks using web browsers.

Hypertext: Text with embedded references (hyperlinks) to other text, allowing immediate access by clicking.

Hyperlinks: References in hypertext that users can follow to navigate between documents or specific elements within them.

Web Browser: Software for accessing and displaying information on the WWW, such as Chrome or Firefox.

Web Page: A document on the WWW that can be static or dynamic, retrieved from a local computer or remote server.

Internet vs. WWW: The Internet is the global network infrastructure, while the WWW is a service of interlinked documents accessed via the Internet.

URL: Uniform Resource Locator, a web address specifying where a resource is available and how to retrieve it.

Email: A method of exchanging digital messages across networks, utilizing a store-and-forward model, allowing users to send and receive messages asynchronously.

Q-69. Name some components of an ATM and mention their functions.

Component	Function
Computer	Manages the ATM operations, stores electronic journal records, and communicates with the bank's switch using TCP/IP.
Display	Shows transaction options and information to users; can be an LCD or touch screen.
Card Reader	Reads data from the magnetic stripe or chip of the customer's card to verify identity.

Q-70. How ATMs brings freedom to the customers?

Automated Teller Machines (ATMs) have significantly enhanced customer freedom in banking. With ATMs, customers no longer need to visit bank branches during specific hours to withdraw or deposit money. ATMs are available 24/7, allowing transactions anytime, even during holidays. This eliminates the need to rush to banks before they close.

ATMs are installed in various locations, including residential areas, offices, and shopping centers, making banking services easily accessible. Additionally, ATMs provide multiple services such as balance inquiries, mini statements, and utility bill payments, further reducing the need to visit bank branches. This convenience has revolutionized banking, providing customers with unparalleled flexibility and access to financial services.

Q-71. Mention five functions of an ATM.

Function	Description
Cash Withdrawal	Allows customers to withdraw money from their bank accounts.
Fund Transfer	Enables transferring funds between accounts within the same bank or to other banks.
Balance Inquiry	Provides the ability to check the account balance.
Mini Statement Printing	Prints a short statement showing recent transactions.
Utility Bill Payment	Facilitates the payment of utility bills such as electricity and water.

Q-72. What is an ATM booth?

An ATM booth is a dedicated space where one or more Automated Teller Machines (ATMs) are installed by a bank. In some cases, ATM booths also include Cash Deposit Machines (CDMs) that accept cash and cheques. These booths are strategically located in areas such as residential neighborhoods, offices, and shopping centers to provide customers with convenient access to banking services. ATMs in these booths offer services like cash withdrawal, balance inquiries, fund transfers, and mini statement printing. ATM booths are available 24/7, providing flexibility for customers to perform transactions at any time, even on holidays.

Q-73. "Acquiring technologies as well as skilled human resources are equally important". Justify this statement. BPE-99th.

Justification: Importance of Technologies and Skilled Human Resources

- 1. Efficiency and Automation:** Technologies like core banking systems streamline operations and improve accuracy.
- 2. Service Enhancement:** Tools such as ATMs and CRMs enable better customer experiences.
- 3. Management and Optimization:** Skilled personnel ensure proper use and maintenance of advanced technologies.
- 4. Adaptability:** Human resources interpret data, adapt systems to changes, and solve unforeseen problems.
- 5. Sustainable Growth:** Combining technology and expertise drives innovation and maintains a competitive edge.

Q-74. What are cyber-crimes? Are cyber-crimes related to banking? If yes, justify. BPE-99th.

Cyber-Crimes and Their Relation to Banking:

Cyber-Crimes: These are criminal activities conducted using computers or digital networks, including hacking, phishing, ransomware attacks, and identity theft.

Relation to Banking:

1. **Data Theft:** Cyber-criminals target banks to steal sensitive customer information, such as account details and passwords.
2. **Fraudulent Transactions:** Online fraud, phishing, and skimming attacks compromise accounts and conduct unauthorized transfers.
3. **Operational Disruptions:** Attacks like ransomware or Distributed Denial-of-Service (DDoS) disrupt banking operations.
4. **Financial Loss:** Cyber-crimes lead to monetary losses for both banks and customers.

Cyber-crimes directly threaten the confidentiality, integrity, and availability of banking systems, making robust cybersecurity essential for financial institutions.

Q-75. Discuss the importance of additional banking applications like ERP and CRM. BPE-99th.

Or, Discuss the usage and benefits of Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) software in financial institutions. How do these applications improve operational efficiency and customer dealing? BPE-6th.

Enterprise Resource Planning (ERP):

- ERP integrates key operations like financial management, human resources, and procurement into a single system.
- It enhances efficiency by streamlining workflows, reducing errors, and improving decision-making through real-time data access.

Customer Relationship Management (CRM):

- CRM helps manage customer interactions and relationships, enabling personalized services.
- It supports marketing, sales, and customer service efforts, fostering customer loyalty and satisfaction.

Together, ERP and CRM improve operational efficiency and customer experience, making them vital tools for modern banking.

Q-76. Explain the terms internet, intranet and extranet. Do you think that internet connectivity should be restricted in an office environment? BPE-98th.

1. **Internet:** A global network connecting millions of private, public, academic, business, and government networks. It enables sharing information across the world.
2. **Intranet:** A private network within an organization designed for internal communication and collaboration. It restricts access to authorized personnel.
3. **Extranet:** Extends an intranet by providing controlled access to external stakeholders, such as business partners or suppliers.

Should Internet Connectivity Be Restricted in Offices?

Restricting internet in offices ensures information security and minimizes distractions. However, allowing controlled access is essential for communication, research, and collaboration. Secure gateways and strict policies can balance productivity and security

Q-77. Who is the father of computer?

Charles Babbage is known as the "Father of the Computer." He was a British mathematician and inventor who designed the first mechanical computer, called the Analytical Engine, in the 1830s. Although it was never completed during his lifetime, the design included key features of modern computers such as input, processing, output, and memory. His earlier invention, the Difference Engine, was meant to perform mathematical calculations. Babbage's ideas laid the foundation for later developments in computing, and his work is recognized as the starting point of computer science history.

Q-78: What is the role of MICR technology in cheque processing system? State the significance of Anti-Malware Software.BPE-6th.

Role of MICR Technology in Cheque Processing System:

MICR (Magnetic Ink Character Recognition) technology is used to process cheques quickly and accurately in banks.

1. MICR helps in **fast reading of cheque information** such as cheque number, bank code, and branch code printed at the bottom of the cheque.
2. It ensures **high accuracy** because magnetic ink can be read even if the cheque is stamped, signed, or slightly damaged.
3. MICR enables **automated cheque sorting and clearing**, reducing manual work.
4. It helps in **speedy clearing through the clearing house**, especially in high-volume cheque transactions.
5. MICR reduces **fraud and errors** in cheque processing by using standardized codes.
6. It supports **efficient inter-bank settlement** and improves overall payment system efficiency.

Significance of Anti-Malware Software:

Anti-Malware Software is essential for protecting banking computer systems from malicious software.

1. It **detects and removes viruses, worms, trojans, spyware, and ransomware**.
2. It protects **customer data and financial information** from cyber attacks.
3. Anti-malware software helps prevent **unauthorized access** to banking systems.
4. It ensures **safe online transactions** and secure digital banking operations.
5. It helps banks maintain **system stability and continuity of services**.
6. It supports **regulatory compliance** related to ICT security and risk management.

Q-79: ICT Security shall be separated from ICT Operations” — What is your opinion? BPE-6th.

Yes, ICT Security shall be separated from ICT Operations in banks and financial institutions.

1. ICT Operations are responsible for day-to-day system operation, while ICT Security is responsible for protecting systems, data, and networks.
2. Separation ensures proper segregation of duties and avoids conflict of interest.
3. Independent ICT Security can monitor access control, cyber threats, and policy compliance objectively.
4. Separation reduces operational risk, cyber risk, and insider threat.
5. It strengthens internal control, audit effectiveness, and accountability.
6. Regulatory and IBB ICT guidelines support this separation as a good governance practice.

This separation ensures secure, reliable, and well-controlled ICT operations in financial institutions.

Case Study

ICT Infrastructure Failure Due to Improper Hardware and Software Coordination:

Mr. Rahat is an Officer working at the operations desk of a mid-sized private commercial bank in Chattogram. The bank recently expanded its branch operations and installed new desktop computers for front-desk services such as account opening, balance inquiry, and transaction posting. Due to cost constraints, the bank procured computers from multiple

vendors without conducting a proper compatibility assessment of hardware components, operating systems, and application software.

During peak banking hours, several computers started freezing repeatedly while processing customer transactions. In some cases, transaction data was entered but not properly saved due to insufficient RAM and frequent system restarts. The operating system occasionally failed to load essential banking application software, causing delays in customer service. As a result, customers had to wait for long periods, manual registers were temporarily used, and end-of-day reconciliation became difficult.

Further investigation revealed that some computers were running outdated operating systems, insufficient memory capacity, and incompatible application software versions. No proper ICT guideline or standard operating procedure (SOP) was followed during procurement and deployment. The branch also lacked basic backup arrangements such as UPS support and temporary data storage mechanisms.

This case highlights how inadequate understanding of basic ICT concepts—such as computer hardware, software, memory, and system coordination—can disrupt banking operations and affect service quality.

Questions:

- (a) Identify the key ICT-related weaknesses in this case from the perspective of computer hardware and software.**
- (b) Explain how insufficient memory and incompatible software can affect accuracy and reliability of banking transactions.**
- (c) From an ICT management perspective, why is standardization of hardware, operating system, and application software important in banking operations?**
- (d) Propose a simple ICT control framework to ensure smooth front-desk banking operations using basic ICT principles.**

Answers:

(a) Key ICT-related weaknesses (Hardware & Software)

The main ICT weaknesses in this case are improper hardware selection, insufficient memory, and incompatible software. The computers had low RAM, which caused freezing during transaction processing. Different operating systems and application software versions were used without checking compatibility. There was no standard configuration followed during procurement. The absence of UPS support increased the risk of sudden shutdown and data loss. Also, no temporary data storage or backup mechanism was available. These weaknesses disrupted normal banking operations and affected service delivery.

(b) Effect of insufficient memory and incompatible software

Insufficient memory slows down system performance and may cause applications to crash during transactions. When software is incompatible with the operating system, data may not be saved properly. This can lead to incomplete transaction records, posting errors, and reconciliation problems. Frequent restarts also increase the risk of data loss. As a result, accuracy and reliability of banking transactions are reduced, and customer service quality deteriorates.

(c) Importance of standardization in ICT systems

Standardization ensures that all computers, operating systems, and software work smoothly together. It reduces system errors, improves processing speed, and ensures accurate transaction posting. Standard systems are easier to maintain and troubleshoot. They also help banks maintain consistent service quality across branches. In banking, where accuracy and continuity are critical, lack of standardization can create operational risk and customer dissatisfaction.

(d) Suggested ICT control framework

The bank should adopt a basic ICT control framework that includes standardized hardware specifications, adequate RAM and storage, and approved operating systems and software. UPS should be installed for uninterrupted power supply. Before deployment, system testing should be done to ensure compatibility. Basic SOPs for procurement, installation, and maintenance should be followed. Regular monitoring and user training should also be ensured to maintain smooth operations.

Compare and contrast

Q-01. Define Information Technology and Information & Communication Technology (ICT). What is the difference between the terms ‘Information Technology’ and ‘Information and Communication Technology’?

Information Technology (IT) is the technology that supports activities involving the creation, storage, manipulation, and communication of information. According to C.S. French, IT encompasses the methods, management, and application related to these activities. IT is not limited to information processing; it also includes the communication of information. Therefore, the term often extends to Information and Communication Technology (ICT). IT involves all processes and systems required to capture, store, process, and communicate information, playing a crucial role in various industries and everyday life.

Information and Communication Technology (ICT) refers to the integration of both computing and telecommunications technologies for the capture, storage, transmission, and retrieval of information. It encompasses a broad range of technologies, from traditional computer systems and software applications to telecommunication devices like smartphones and networking hardware.

Feature	Information Technology (IT)	Information and Communication Technology (ICT)
Scope	Primarily computing and software	Computing, software, and telecommunications
Primary Uses	Data storage, processing, analytics	Data and information sharing, communication
Key Disciplines	Computer Science, Software Engineering	Computer Science, Telecommunications Engineering

Q-02. Mention a few differences between SMS and Alert Banking.

Feature	SMS Banking	Alert Banking
1. Definition	Allows you to send text messages to perform banking tasks like checking balances or transferring money.	Automatically sends you text notifications about activities in your bank account.

2.Interaction	Two-way: You send a command, and the bank replies.	One-way: The bank sends you alerts without requiring you to initiate the interaction.
3. Initiation	User-initiated: You have to send a text to get information or perform a task.	Automatic: Alerts are sent by the bank based on preset conditions like large transactions.

Q-03: Describe the differences between minicomputer and mainframe computer.

Feature	Minicomputer	Mainframe Computer
1. Definition	A mid-sized computer designed for small to medium-sized businesses or departments.	A powerful computer used for large-scale data processing and handling multiple tasks simultaneously in large organizations.
2. Size	Smaller than mainframes, but larger than microcomputers.	Large and may require a specialized room.
3. Cost	Less expensive, making them accessible for smaller organizations.	Generally more expensive due to their superior capabilities and features.

Q-04. What are the differences between a system software and application software?

Feature	System Software	Application Software
1. Definition	Software that controls computer hardware	Software that helps users perform tasks
2. Purpose	Manages system operations	Solves specific problems or tasks
3. Examples	Operating System, Device Drivers	Microsoft Word, Games, Photoshop

Q-05. Differentiate between a dot matrix and a laser printer.

Feature	Dot Matrix Printer	Laser Printer
1.Printing Technology	Uses pins to strike ink ribbon	Uses laser beams and toner
2. Speed	Slower	Faster
3.Print Quality	Lower, good for text	High, good for text and graphics

Q-06. Differentiate Data and Information. Describe five features of ICT for which it is important and widely used in the financial services industry. BPE-98th.

Aspect	Data	Information
1.Definition	Raw, unprocessed facts and figures without context.	Processed, organized, and structured data that is meaningful and useful.
2.Nature	Raw and unprocessed.	Processed and organized.
3.Form	Numbers, symbols, text without context.	Contextualized and meaningful.

Features of ICT in the Financial Services Industry

- 1. Speed and Efficiency:** ICT enables rapid processing of transactions and data, reducing the time required for financial operations.
- 2. Accuracy and Reliability:** Automated systems minimize human error, ensuring accurate and reliable financial records and transactions.
- 3. Security:** Advanced encryption and cybersecurity measures protect sensitive financial data from unauthorized access and fraud.

4. **Accessibility:** ICT allows customers to access financial services anytime and anywhere through online banking and mobile applications.
5. **Data Management:** Efficient storage, retrieval, and analysis of large volumes of financial data help in decision-making and regulatory compliance.

These features make ICT indispensable for enhancing operational efficiency, customer service, and security in the financial services industry.

Q-07: What are the differences among ATM, CDM and CRM?BPE-6th.

Feature	ATM (Automated Teller Machine)	CDM (Cash Deposit Machine)	CRM (Cash Recycling Machine)
1.Primary Function	Withdraws cash	Accepts cash deposits	Both accepts and dispenses cash
2.Services Provided	Cash withdrawal, balance check, mini statement	Cash deposit, balance check	Cash deposit, cash withdrawal, balance check
3.Usage	Mainly used for withdrawing money	Used for depositing money	Used for both depositing and withdrawing money

Q-08. Identify differences between IPv4 and IPv6?

Feature	IPv4	IPv6
Address Length	32-bit	128-bit
Header Length	Variable	Fixed
Security	Optional	Built-in

1. **Address Length:** IPv4 uses 32-bit addresses, while IPv6 uses 128-bit addresses, offering more possible addresses.
2. **Header Length:** IPv4 headers can be variable in length, while IPv6 headers are fixed at 40 bytes, simplifying processing.
3. **Security:** Security in IPv4 is optional and usually provided by external software. IPv6 has built-in security features like IPsec.

Q-09: Electronic Banking vs. Online Banking BPE-6th:

Point	Electronic Banking	Online Banking
Scope	Electronic Banking includes all electronic banking services.	Online Banking includes only internet-based banking services.
Internet	Internet is not always required.	Internet is always required.
Example	ATM cash withdrawal and card payment are electronic banking services.	Fund transfer through bank website or app is online banking.

End of First Chapter

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