

PROGRAM: DIPLOMA IN INFORMATION TECHNOLOGY**1. Q. Define e-commerce. Write down the application and scope of e-commerce.****Definition of E-Commerce**

E-Commerce (Electronic Commerce) refers to the buying, selling, and exchanging of goods, services, or information electronically over computer networks, primarily the internet.

2. Scope of E-Commerce

The scope of e-commerce covers a broad range of business functions, technologies, and operational models:

- **Business Models:** B2B (Business-to-Business), B2C (Business-to-Consumer), C2C (Consumer-to-Consumer), and B2B e-procurement.
- **Electronic Payment Systems (EPS):** Online banking, digital wallets (like eSewa), credit/debit card processing, and Electronic Funds Transfer (EFT).
- **Marketing and Advertising:** E-marketing, online advertising, search engine promotion, and Customer Relationship Management (CRM).
- **Data Interchange & Logistics:** Electronic Data Interchange (EDI) for automated business document exchange and Just-in-Time (JIT) delivery.
- **Mobile & Wireless Commerce:** M-commerce applications and Wireless Application Protocol (WAP) architecture.
- **Legal and Security Framework:** Cyber law, digital signatures, cryptography, encryption policies, and e-commerce taxation.

3. Applications of E-Commerce

Key real-world applications of e-commerce include:

1. **Online Retailing & Marketplaces:** Digital storefronts and consumer shopping platforms for goods and services.
2. **E-Procurement:** Business-to-business purchasing and supply chain automation.
3. **Electronic Banking & Financial Services:** Online fund transfers, digital wallet transactions, and online bill payments.
4. **Mobile Commerce (M-Commerce):** Location-based services, mobile shopping apps, and mobile ticketing.
5. **E-Marketing & Online Advertising:** Digital ad campaigns, consumer browsing behavior tracking, and personalized search.

2 . Define e-procurement. Differentiate between B2C and B2B e-commerce business models.

E-Procurement (Electronic Procurement) refers to the business-to-business (B2B) purchasing and sale of supplies, work, and services through the internet and other network systems.

Difference between B2C and B2B E-Commerce (6 Marks)

Point	B2C (Business-to-Consumer)	B2B (Business-to-Business)
Who buys?	Individual customers buying for personal use (e.g., buying a phone for yourself).	Companies/Businesses buying for business use or resale (e.g., a store buying 500 phones from a factory).
Order Size	Small quantity, low price per order.	Bulk/large quantity, high total amount.
Buying Speed	Quick buying decision (usually takes minutes or hours).	Slow decision (takes weeks because multiple managers must approve).
Price	Fixed price (same price for everyone).	Negotiated/Discounted price based on contract or quantity.
Payment Method	Instant payment using eSewa, debit card, or cash on delivery.	Invoices, credit terms (like 30-day payment), or bank transfers.
Examples	Buying clothes on Daraz or Amazon.	Buying raw materials on Alibaba.

3 Define e-marketing. Explain how online marketing is differ from offline marketing.

E-Marketing (Electronic Marketing or Online Marketing) means using the **internet and digital technologies** to promote, advertise, and sell products or services.

Difference between Online Marketing and Offline Marketing (6 Marks)

Point	Online Marketing	Offline Marketing
Medium Used	Uses digital platforms like websites, social media, and email.	Uses traditional media like newspapers, TV, radio, and billboards.
Reach & Audience	Global reach—you can target customers anywhere in the world.	Local or limited reach—targets people in a specific geographic area.
Cost	Much cheaper and flexible; suitable for small businesses.	Very expensive (e.g., printing flyers or paying for TV ads).
Customer Interaction	Two-way communication —customers can comment, like, chat, or leave reviews instantly.	One-way communication —customers just view or listen to the ad without instant feedback.
Tracking & Results	Easy to measure—you can see exact views, clicks, and sales in real time.	Hard to track—difficult to know how many people bought a product because of a billboard.
Speed & Customization	Ads can be updated or changed anytime within seconds.	Once printed or broadcasted, ads cannot be easily changed.

4. Explain the architecture of Wireless Application Protocol (WAP).

WAP (Wireless Application Protocol) is a standard set of rules that allows mobile devices (like smartphones and feature phones) to access the internet, emails, and web applications over wireless networks.

2. How WAP Works (Working Flow)

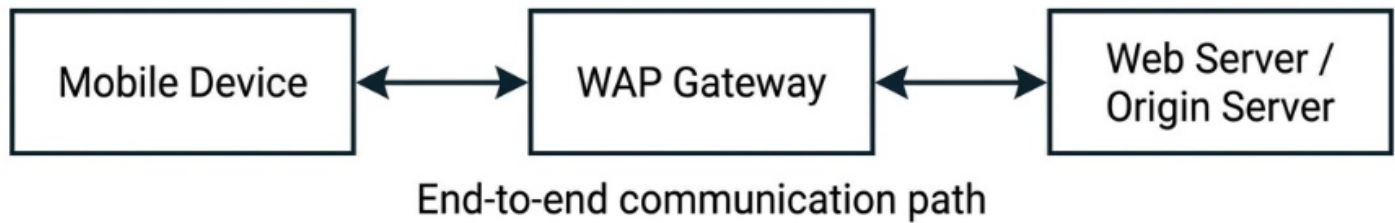
When you open a website on a mobile device, the communication happens through 3 main components:

[Mobile Device / Client] ↔ [WAP Gateway] ↔ [Web Server]

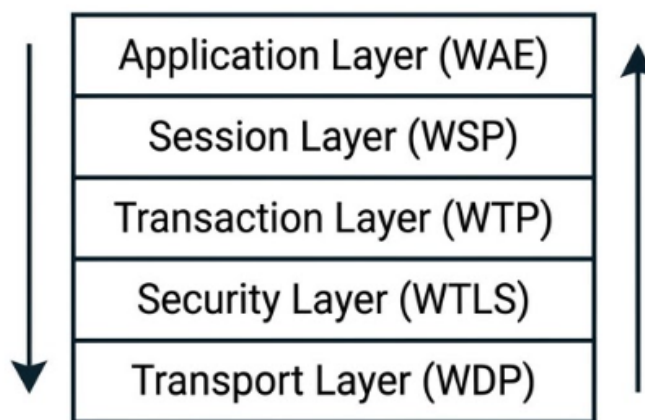
1. **Mobile Phone** sends a request using WAP protocols.
2. **WAP Gateway** converts the mobile WAP request into a standard HTTP request and sends it to the Web Server.
3. **Web Server** processes the request and sends the webpage back.

4. **WAP Gateway** compresses the data into a lightweight format (WML) and sends it back to the mobile screen.

1. Working Flow



2. Protocol Layers (WAP Stack)



a) Explain the role of network infrastructure in e-commerce.

Key Roles of Network Infrastructure

1. Connects Buyers and Sellers Globally:

- It provides the broadband, Wi-Fi, and mobile networks (3G/4G/5G) so customers can browse online stores from anywhere in the world.

2. Enables Data Transfer and Communication:

- Hardware devices like **routers and switches** send website data, product details, and orders smoothly between the customer's phone and the business server using protocols like **TCP/IP**.

3. Ensures Secure Transactions:

- Network security tools (like **firewalls and SSL/TLS encryption**) protect sensitive financial data like passwords, credit card numbers, and bank details from hackers during online payments.

4. Provides High Speed and Reliability:

- A strong network infrastructure prevents website crashes when thousands of users shop at the same time, ensuring fast page loading and smooth payment processing.

4 b) Define software agent. What are the types of software agent?

What is a Software Agent?

A **Software Agent** is an automated computer program that acts independently on behalf of a user to perform specific tasks automatically without needing constant human direction.

2. Types of Software Agents

1. Buyer Agents (Shopping Agents / Shopbots):

- Helps users find specific products and compare prices across multiple e-commerce websites.
- *Example:* Price-comparison tools like Google Shopping or Trivago.

2. User / Personal Agents:

- Learns a user's habits and preferences to automate daily personal tasks.
- *Example:* Virtual assistants like Siri or Google Assistant, and automatic email sorters.

3. Monitoring and Surveillance Agents:

- Continuously tracks and observes systems in real time to alert users about changes, stock updates, or security risks.
- *Example:* Bank fraud-detection agents or stock market alert bots.

4. Data Mining Agents:

- Searches through huge amounts of customer data to discover patterns and make smart business recommendations.
- *Example:* Netflix movie recommendations or Amazon's "Customers who bought this also bought..." feature.

6. Explain following terms:

a) Wi-Fi b) FTP c) Search engine d) JIT (Just in time delivery)

a) Wi-Fi (Wireless Fidelity)

- Wi-Fi is a wireless networking technology that allows mobile devices, laptops, and tablets to connect to the internet without using physical cables.
- **How it works:** It uses **radio frequency signals** to transmit data between a device and a wireless router.
- **Role in E-Commerce:** Enables customers to browse online stores, make digital payments, and use mobile shopping apps anytime without being plugged into wired internet.

b) FTP (File Transfer Protocol)

: FTP is a standard network protocol used to upload or download files (like images, documents, and web code) between a local computer and a remote web server over the internet.

- **How it works:** Uses a **Client-Server model** (FTP client connects to FTP server).
 - **Role in E-Commerce:** Website managers use FTP to quickly upload product photos, catalog updates, and website code files to their e-commerce web server.
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c) Search Engine

- A Search Engine is a web software tool that helps users search for and locate information, websites, or products on the internet using keywords.
 - **Examples:** Google, Bing, Yahoo.
 - **Role in E-Commerce:** Helps shoppers discover online stores. E-commerce businesses use **SEO (Search Engine Optimization)** so their products rank on top when users search for items to buy.
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d) JIT (Just-In-Time Delivery)

- JIT is an inventory management method where items or raw materials are ordered and delivered **only when they are needed** for sale or production, instead of holding large inventory in a warehouse.
- **Key Benefits:**
 - Reduces warehouse storage costs.
 - Prevents unsold stock or product damage.
- **Role in E-Commerce:** Allows e-commerce stores to fulfill customer orders quickly through automated supply chain tracking without storing huge inventory.

7 . Define EPS. List and explain types of EPS.

EPS (Electronic Payment System) is a digital method that allows buyers to pay for goods, services, or bills online over the internet without using physical cash or paper cheques. It securely transfers funds between the buyer's bank account and the seller's bank account electronically.

2. Types of Electronic Payment Systems (6 Marks)

1. Payment Cards (Credit & Debit Cards):

- **Debit Card:** Deducts money directly from your bank account instantly when you make a payment.
- **Credit Card:** Allows you to borrow money from the bank up to a set limit to pay now and settle the bill later.
- *Examples:* Visa, MasterCard, SCT card.

2. Digital Wallets (E-Wallets):

- An electronic app on your phone that stores money to pay bills, top up mobile balance, or pay merchants using a QR code.
- *Examples:* eSewa, Khalti, IME Pay.

3. Online / Internet Banking:

- A service provided by banks allowing customers to transfer money, check account balances, and pay bills directly through the bank's official portal.
- *Examples:* ConnectIPS, Bank Smart apps.

4. Electronic Funds Transfer (EFT):

- Direct transfer of money electronically from one bank account to another across different banks without human intervention.
- *Examples:* Automated Teller Machines (ATM) transfers, wire transfers.

5. Electronic Cheque (E-Cheque):

- A digital version of a paper cheque. It contains the same information as a regular cheque, but uses digital signatures for verification and processing.

8. Differentiate between entrepreneur and manager. List few characteristics of successful entrepreneur.

Difference between Entrepreneur and Manager (5 Marks)

Parameter	Entrepreneur	Manager
Basic Role	Creates a new business by coming up with a new idea or innovation.	Manages and runs an already existing business or organization.

Ownership	Owner of the company/business.	Employee of the company (hired by the owner).
Risk	Takes high financial and personal risk if the business fails.	Takes no financial risk (gets a fixed salary regardless of profit or loss).
Reward / Income	Receives profits earned by the business (can be very high or zero).	Receives a fixed monthly salary and bonuses.
Main Focus	Focuses on innovation, business growth, and future vision .	Focuses on daily operations, efficiency, and maintaining order .

2. Key Characteristics of a Successful Entrepreneur (3 Marks)

1. **Risk-Taker:** Willing to take calculated financial and business risks to achieve success.
2. **Innovative & Creative:** Constantly thinks of new ideas, products, or solutions to solve customer problems.
3. **Passionate & Self-Motivated:** Hardworking and persistent, even when facing failures or challenges.
4. **Good Decision-Maker:** Able to make quick, clear, and effective business decisions under uncertainty.

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9. Why we need e-commerce law? Explain the e-commerce law of Nepal.

Why Do We Need E-Commerce Law?

We need e-commerce law for the following key reasons:

- **Legal Recognition:** To make online contracts, digital signatures, and electronic receipts legally valid just like physical paper documents.
- **Fraud & Crime Prevention:** To protect online shoppers and businesses from hacking, identity theft, credit card fraud, and scams.
- **Consumer Protection:** To ensure customers get what they paid for, with fair return, refund, and privacy policies.
- **Dispute Resolution:** To provide a legal court system to resolve conflicts between buyers, sellers, and payment gateways.

2. E-Commerce Law of Nepal

In Nepal, e-commerce and digital transactions are primarily governed by the **Electronic Transaction Act (ETA), 2063 BS (2006 AD)** along with the **E-Commerce Act, 2080 BS**.

Key provisions and features of Nepal's e-commerce laws include:

1. **Legal Validity of Digital Signatures & Records:**
 - Electronic documents, digital signatures, and online contracts are accepted as legal evidence in Nepalese courts.
2. **Strict Punishment for Cybercrimes:**
 - Defines severe penalties (fines and imprisonment) for hacking, website defacement, unauthorized data access, software piracy, and online financial fraud.
3. **Controller of Certification Authority (CCA):**
 - Establishes a government authority to license, regulate, and supervise digital certificate providers (issuing digital signatures).
4. **Information Technology (IT) Tribunal:**
 - Creates specialized IT Courts/Tribunals to handle and solve cybercrime cases and e-commerce disputes quickly.
5. **Merchant & Consumer Guidelines:**
 - Mandates online sellers to clearly list product details, pricing, delivery charges, and return policies.
 - Protects customer personal data and financial information from unauthorized sharing.

10.a) Write in brief about emergence of internet and commercial use of internet.

Emergence of the Internet)

- **Origin:** The internet started in the late **1960s** as a research project called **ARPANET** (Advanced Research Projects Agency Network), funded by the U.S. Department of Defense to connect university and government computers.
- **Growth:** In the **1980s and 1990s**, standard networking protocols like **TCP/IP** and the creation of the **World Wide Web (WWW)** by Tim Berners-Lee allowed the internet to expand globally, connecting public users, businesses, and institutions.

2. Commercial Use of the Internet

Originally, the internet was restricted strictly to government, academic, and military research. In the early **1990s**, commercial restrictions were lifted, opening the internet to private businesses.

Key commercial uses include:

1. **Online Shopping & Retail:** Businesses opened digital storefronts to sell goods directly to global customers (e.g., Amazon, Daraz).
2. **Digital Payments & Banking:** Banks introduced online fund transfers, digital wallets, and electronic billing.
3. **Digital Marketing & Advertising:** Companies switched from paper ads to targeted social media ads, search engine marketing, and email campaigns.
4. **Communication & Business Operations:** Businesses use emails, cloud storage, and video conferencing to manage supply chains and communicate with clients instantly.

b) Explain entrepreneurial culture

Entrepreneurial Culture refers to a business environment or mindset within an organization that encourages employees and individuals to think creatively, take calculated risks, innovate, and continuously look for new business opportunities.

Key Features / Elements of Entrepreneurial Culture

1. **Focus on Innovation & Creativity:**
 - Encourages everyone in the organization to come up with new ideas, products, or better ways to solve customer problems.
2. **Tolerance for Risk & Failure:**
 - People are not punished for taking calculated risks that don't work out. Instead, failure is treated as a valuable learning experience.
3. **Flexibility & Autonomy:**
 - Gives employees freedom and flexibility to experiment with new projects without needing permission for every small step.
4. **Continuous Learning & Adaptability:**
 - Focuses on learning new technologies, market trends, and adapting quickly to changing customer needs.
5. **Team Collaboration & Open Communication:**
 - Promotes open discussions where managers and employees share ideas freely to grow the business together.

11. Write short notes on: (any TWO)

a) Taxation and encryption policies b) eSewa c) EDI

Taxation and Encryption Policies

1. Taxation Policies:

- **What it is:** Rules set by governments to collect taxes (like Value Added Tax - VAT or customs duty) on goods and services sold online.
- **Key Issues:** Online businesses can sell across borders without physical stores, making it tricky for governments to determine where and how much tax should be collected. Clear taxation policies ensure fair trade between online and traditional shops.

2. Encryption Policies:

- **What it is:** Security rules and protocols used to convert sensitive data (like passwords, credit card numbers, and bank details) into an unreadable secret code before transmitting it across the internet.
- **Importance:** Protects online buyers from hackers, data theft, and cyber fraud using technologies like **SSL/TLS certificates** and **Digital Signatures**.

b) eSewa

- **Definition:** eSewa is Nepal's first and most popular **digital wallet (e-wallet)** and online payment gateway, licensed by Nepal Rastra Bank.
- **Key Features & Functions:**
 - **Bill Payments:** Allows users to pay electricity, water, landline, and internet bills directly from their mobile phones.
 - **Mobile Top-up & Recharge:** Instant balance top-up for NTC, Ncell, and Smart Cell.
 - **Online Shopping & Ticketing:** Used to pay on e-commerce platforms (like Daraz), book airline/bus tickets, and buy movie tickets.
 - **Merchant QR Payments:** Scan-to-pay feature using Fonepay QR codes at local shops and restaurants.
- **Significance in Nepal:** Promotes a cashless economy by making digital payments accessible even to people without credit cards.

c) EDI (Electronic Data Interchange)

- **Definition:** EDI is the computer-to-computer exchange of standard business documents (like purchase orders, invoices, shipping notices, and price quotes) directly between two organizations without using paper forms.

- **How it Works:** Company A's computer automatically translates a purchase order into a standard EDI format and sends it electronically to Company B's computer system.
- **Key Benefits:**
 - **Saves Time & Money:** Eliminates paper printing, postage, and manual data entry.
 - **Reduces Errors:** Prevents human typing mistakes in order details.
 - **Faster Business Cycle:** Orders are processed in minutes instead of da

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1. Define e-commerce. Discuss the scope of commerce. Explain the application of E-Commerce (Electronic Commerce) means buying, selling, or transferring goods, services, and digital information over the internet using electronic devices like mobile phones, laptops, and computers.

- **Simple Example:** Ordering clothes on **Daraz** or buying an online course using **eSewa**.

Scope of Electronic Commerce

The **scope** of e-commerce is huge because it covers almost every area of business today:

1. **Global Market Reach:** Businesses are not limited to one city or country—they can sell to customers worldwide 24/7.
2. **Digital Payments & Financial Services:** Online banking, digital wallets (eSewa/Khalti), and instant wire transfers.
3. **Supply Chain & Inventory Management:** Electronic Data Interchange (EDI) and e-procurement between suppliers, factories, and retailers.
4. **Customer Relationship Management (CRM):** Using automated emails, chatbots, and personalized search to support customers instantly.
5. **Digital Entertainment & Services:** Streaming movies (Netflix), booking hotel/flight tickets, and online education.

3. Applications of E-Commerce

1. **Online Retailing (E-Tailing):** Virtual shops where customers can view products, read reviews, and buy online (e.g., Daraz, Amazon).
2. **Mobile Commerce (M-Commerce):** Shopping and paying directly through mobile apps and QR codes anywhere on the go.
3. **Online Banking & Bill Payments:** Paying electricity, water, internet bills, and transferring money between bank accounts digitally.

2. Explain various types of e-commerce models.

Main Types of E-Commerce Models

1. B2C (Business-to-Consumer)

- **Meaning:** A business sells goods or services directly to individual end-customers for personal use.
- **Key Features:** High volume of orders, small price per order, quick purchasing decisions.
- **Example:** Buying shoes or a mobile phone on **Daraz** or **Amazon**.

2. B2B (Business-to-Business)

- **Meaning:** Transactions occur directly between two businesses (e.g., a wholesaler and a retailer, or a manufacturer and a factory).
- **Key Features:** Bulk quantities, negotiated prices, long-term contracts, high total value.
- **Example:** A clothing retailer buying 1,000 shirts from a factory supplier on **Alibaba**.

3. C2C (Consumer-to-Consumer)

- **Meaning:** Individual consumers sell products or services directly to other individual consumers through a third-party website/platform.
- **Key Features:** Second-hand items, bidding/negotiation, user-to-user transactions.
- **Example:** Selling your used bike or old laptop to another student on **Hamrobazaar** or **eBay**.

4. C2B (Consumer-to-Business)

- **Meaning:** Individual customers or freelancers offer their services, skills, or products to businesses.
- **Key Features:** Reverse auction, freelance platforms, custom projects.
- **Example:** A student creating a logo or website design for a company on **Fiverr** or **Upwork**.

5. B2G (Business-to-Government)

- **Meaning:** Private businesses supply goods, services, or software solutions to government bodies.
- **Key Features:** Online tender submission, strict regulations, large government contracts.
- **Example:** A tech firm building a biometric system or software for the **Department of Transportation**.

6. G2C (Government-to-Citizen)

- **Meaning:** The government provides online public services, licenses, and official documents directly to citizens.
- **Key Features:** Public welfare, digital convenience, reduces physical queue lines.
- **Example:** Paying tax, applying for a driving license, or using the **Nagarik App** in Nepal.

7. M-Commerce (Mobile Commerce)

- **Meaning:** Sub-category of e-commerce where buying and selling happen specifically using wireless handheld mobile devices (smartphones/tablets).
- **Example:** Scanning a Fonepay QR code with **eSewa** or ordering food via the **Foodmandu app**.

3. a. Define e-marketing. How online marketing is differ from traditional marketing?

E-Marketing (Electronic Marketing / Online Marketing) is the process of promoting, advertising, and selling products or services using the **internet and digital technologies** (like websites, social media, search engines, and emails).

2. How Online Marketing Differs from Traditional Marketing (5 Marks)

Parameter	Online Marketing (E-Marketing)	Traditional Marketing (Offline)
Medium Used	Internet, Social Media (FB, Insta), Google Ads, Websites, Email.	Newspapers, TV, Radio, Billboards, Pamphlets.
Reach & Audience	Global Reach —target customers anywhere in the world 24/7.	Local Reach —limited to a specific city or geographical region.
Cost & Budget	Highly cost-effective; flexible for small budgets and startups.	Very expensive (e.g., printing flyers or booking TV ad slots).
Interaction	Two-Way Communication —customers can like, comment, chat, or leave instant reviews.	One-Way Communication —customers only view or listen without instant feedback.
Tracking & Results	Real-Time Analytics —track exact views, clicks, and sales instantly.	Hard to Measure —difficult to count how many people bought a item due to a billboard.
Flexibility	Ads can be modified or stopped anytime within seconds.	Once printed or broadcasted, ads cannot be changed easily.

3b. Explain in brief about the various issues related to online marketing..

Issues Related to Online Marketing [4 Marks]

Online marketing offers great advantages, but businesses face several key issues:

1. Privacy and Data Security Concerns:

- Customers are often afraid to share personal info or credit card numbers online due to risks of **data theft, hacking, and spam**.

2. High Competition & Ad Fatigue:

- Millions of businesses advertise online daily. Standing out requires constant effort, and users often ignore or block ads using **Ad-Blockers**.

3. Trust & Tangibility Deficit:

- Customers cannot physically touch, try, or inspect products before buying online, leading to doubts about product quality and higher return rates.

4. Technical & Infrastructure Issues:

- Requires stable internet and technical skills. In developing regions with slow internet connectivity, rich media ads or websites fail to load properly.

4. a. Discuss generations in wireless communication.

Wireless generations (1G to 5G) represent the evolution of mobile technology in terms of speed, data capacity, and services.

1. 1G (First Generation - 1980s):

- Technology:** Analog signals.
- Feature:** Voice calls only (heavy brick phones).
- Speed:** Up to 2.4 kbps.

2. 2G (Second Generation - 1990s):

- Technology:** Digital signals (GSM/CDMA).
- Feature:** Introduced **SMS text messaging** and basic data connection.
- Speed:** Up to 64 kbps.

3. 3G (Third Generation - 2000s):

- Technology:** WCDMA / UMTS.
- Feature:** Enabled mobile internet browsing, video calls, and e-commerce apps.
- Speed:** 2 Mbps to 21 Mbps.

4. 4G (Fourth Generation - 2010s):

- Technology:** LTE (Long Term Evolution).

- **Feature:** High-speed mobile broadband, HD streaming, and mobile digital payments.
- **Speed:** 100 Mbps to 1 Gbps.

5. **5G (Fifth Generation - Present):**

- **Technology:** Ultra-high frequency bands with very low latency.
- **Feature:** Powers Internet of Things (IoT), smart cities, and instant global transactions.
- **Speed:** Up to 10 to 20 Gbps.

4.b. **Explain the security issues related to wireless communication.**

Since wireless networks use radio waves in open air instead of cables, they face these main security threats:

1. **Eavesdropping / Packet Sniffing:**

- Hackers intercept unencrypted data signals in public Wi-Fi to steal passwords and financial info.

2. **Man-in-the-Middle (MitM) Attack:**

- An attacker secretly intercepts the communication between a mobile device and the wireless router to alter or steal data.

3. **Rogue Access Points (Evil Twin Attack):**

- Hackers create fake Wi-Fi networks (e.g., "Free_Coffee_WiFi") to trick users into connecting and logging in.

4. **Unauthorized Access (Piggybacking):**

- Unintended users connect to weak or unpassworded Wi-Fi networks to access private files or misuse bandwidth.

5. **Signal Jamming / DoS Attack:**

- Attackers flood the radio frequencies with interference noise to disrupt wireless connectivity and crash services.

5. a. What do you mean by software agent? Explain its types in brief.

A Software Agent is an automated program that acts independently on behalf of a user to perform repetitive or specific tasks automatically without needing continuous human intervention..

#Types of Software Agents.

1. Buyer Agents (Shopping Bots):

- Role: Helps customers find products, check stock, and compare prices across different e-commerce stores.
- *Example:* Google Shopping, Trivago.

2. Personal / User Agents:

- Role: Learns user preferences to perform daily routine tasks automatically.
- *Example:* Siri, Google Assistant, or automatic email sorting bots.

3. Monitoring and Surveillance Agents:

- Role: Continuously tracks systems or networks in real time and alerts users when changes or security threats occur.
- *Example:* Stock price alert bots, bank fraud detection systems.

4. Data Mining Agents:

- Role: Analyzes large volumes of customer browsing and transaction data to discover hidden patterns and make recommendations.
- *Example:* Amazon's product recommendations ("Customers who bought this also bought...").

5. Collaborative Agents:

- Role: Works together with other software agents over a network to share information and solve complex business problems.

b. Explain in brief about the use of network routers.

A **Network Router** is a networking hardware device that connects two or more different networks (like connecting a local home/office network to the internet). It directs data packets between devices and destination servers using the **IP (Internet Protocol) address**.

2. Key Uses of Network Routers in E-Commerce

1. Traffic Direction & Data Routing:

- Analyzes data packets and determines the best and fastest path for customer order requests to travel from their phone to the e-commerce web server.

2. Network Connection & Sharing:

- Allows multiple computers, phones, and payment terminals in an organization to share a single internet connection.

3. **Security & Firewall Protection:**

- Modern routers come with built-in **firewalls and packet filtering** to block unauthorized traffic and protect customer payment data from external security threats.

4. **Network Segmentation:**

- Helps businesses separate internal office networks from public customer Wi-Fi, keeping internal financial databases private and secure.

6. **Define electronic payment system. Explain its types in brief.**

An **Electronic Payment System (EPS)** is a digital financial system that allows buyers to pay for goods and services over the internet without using physical cash or paper cheques.

. **Types of Electronic Payment Systems.**

1. **Payment Cards (Debit & Credit Cards):**

- **Debit Cards:** Deducts funds directly from the buyer's bank account instantly upon purchase.
- **Credit Cards:** Allows the customer to borrow money from the card-issuing bank up to a set limit to pay now and settle the balance later.
- *Examples:* Visa, MasterCard, SCT Card.

2. **Digital Wallets (E-Wallets):**

- A mobile software application that stores funds electronically to pay utility bills, purchase tickets, or scan merchant QR codes.
- *Examples:* eSewa, Khalti, IME Pay.

3. **Online / Internet Banking:**

- Direct banking portal or mobile app provided by banks that allows customers to make inter-bank fund transfers, pay merchant bills, and manage accounts digitally.
- *Examples:* ConnectIPS, mobile banking apps.

4. **Electronic Funds Transfer (EFT):**

- Automatic computer-based transfer of money from one bank account to another across financial institutions without human clerk intervention.
- *Examples:* ATM cash transfers, Wire Transfers.

5. **Electronic Cheque (E-Cheque):**

- A digital equivalent of a traditional paper cheque containing digital signatures and encrypted account info for safe clearing.

7. a.Explain in brief about entrepreneurship development.

Entrepreneurship Development is the process of improving the skills, knowledge, and mindset of potential entrepreneurs through training, workshops, mentorship, and institutional support. Its main goal is to motivate and equip individuals to launch, manage, and scale new business ventures successfully while reducing the risk of failure.

2. Key Components of Entrepreneurship Development

1. Entrepreneurial Training & Skill Building:

- Teaches core business management skills, such as financial planning, marketing strategies, leadership, and digital technology integration.

2. Access to Resources & Capital:

- Connects new entrepreneurs with bank loans, venture capital, seed funding, and government subsidies.

3. Business Incubation & Mentorship:

- Offers expert advice, office space, and technical support to help turn raw business ideas into working commercial models.

4. Policy & Infrastructure Support:

- Simplifies company registration procedures, patent filings, and legal compliance to build a startup-friendly environment.

3. Why is it Important?

- Job Creation:** Turns job seekers into job creators.
- Economic Growth:** Introduces new products and services that boost national GDP and innovation.
- Promotes Digital Startups:** Encourages young founders to build e-commerce stores, fintech apps, and tech-driven solutions.

b. Explain the different attributes and characteristics of successful entrepreneur.

Attributes

- Visionary Outlook:** They see market gaps before others notice them.
- Risk Appetite:** They take calculated financial and professional risks willingly.
- High Self-Motivation:** Internal drive fuels them without needing external management.
- Resilience:** Failure is viewed as a lesson rather than a dead end.
- Locus of Control:** They believe their actions directly determine their success.

Key Characteristics .

- Adaptability:** They pivot strategies quickly when market conditions change.

- **Strong Networking:** Building relationships unlocks funding, talent, and mentorship opportunities.
- **Decisiveness:** Making firm decisions under pressure keeps the business moving forward.
- **Continuous Learning:** They constantly update their industry, technical, and market knowledge.
- **Resourcefulness:** Maximizing limited capital and tools helps them survive early stages.

8.a.Highlight some of the legal incidents related to e-commerce.

As online shopping and digital transactions have grown, several major legal issues and incidents occur in e-commerce:

1. Online Fraud & Financial Scams:

- Scammers set up fake e-commerce websites to collect payments from buyers without delivering the ordered products.

2. Hacking and Data Breaches:

- Cybercriminals hack into e-commerce databases to steal customer personal information, passwords, and credit card details (identity theft).

3. Intellectual Property (IP) Infringement:

- Selling counterfeit (fake) branded goods or unauthorized pirated software, movies, and e-books without the original owner's permission.

4. Breach of Contract & Misleading Advertising:

- Sellers delivering defective or completely different products than what was shown online, or refusing return/refund requests.

5. Customer Data Privacy Violations:

- E-commerce platforms secretly tracking customer browsing habits and selling their personal contact data to third-party ad agencies without consent.
-

b. Write the Nepal Government Policies related to e-commerce.

The Nepal Government has formulated key acts, policies, and regulatory guidelines to legalise and govern e-commerce:

1. Electronic Transaction Act (ETA), 2063 BS (2006 AD):

- The core cyber law of Nepal that grants legal validity to digital signatures, electronic contracts, and online receipts, while establishing strict penalties for cybercrimes.

2. National E-Commerce Act / Policy (2080 BS):

- Regulates online businesses in Nepal by making business registration mandatory, enforcing consumer return/refund policies, and requiring clear disclosure of prices and product details.

3. Nepal Rastra Bank (NRB) Digital Payment Directives:

- Formulates rules and licenses Payment Service Providers (PSPs) like eSewa, Khalti, and ConnectIPS to ensure secure digital transactions and set daily payment limits.

4. National Information Technology (IT) Policy:

- Focuses on expanding broadband internet infrastructure across rural Nepal, promoting IT entrepreneurship, and implementing e-governance services.

5. Consumer Protection Act, 2075 BS:

- Protects online buyers from price gouging, fake discounts, defective products, and unfair trade practices by online sellers.

9. Write short notes on: (any TWO)

a. Emergence of internet

b. Electronic data interchange

c. Internet security

d. Entrepreneur Vs manager

a) Emergence of Internet

- **Origin:** Started in the late **1960s** as **ARPANET** by the U.S. Department of Defense to connect research computers.
- **Commercial Growth:** In the 1990s, the introduction of the **World Wide Web (WWW)** and removal of commercial restrictions transformed the internet into a global network for public users and businesses.
- **Role in E-Commerce:** Serves as the digital backbone that enables global online shopping, digital banking, remote communication, and 24/7 commercial transactions.

b) Electronic Data Interchange (EDI)

- **Definition:** Computer-to-computer exchange of standard business documents (like purchase orders, invoices, and shipping notices) directly between two organizations.
- **Key Benefits:**
 - **No Paperwork:** Eliminates manual paper forms, printing, and postal delays.
 - **Faster Processing:** Documents are transferred and processed in minutes instead of days.
 - **Reduces Human Error:** Avoids manual re-typing mistakes in orders and bills.

c) Internet Security

- **Definition:** A collection of security protocols, policies, and tools designed to protect internet-connected systems, networks, and data from unauthorized access or cyber attacks.
- **Core Protection Tools:**
 - **Encryption (SSL/TLS):** Scrambles sensitive information (like passwords and credit cards) into unreadable code during transmission.
 - **Firewalls:** Blocks unauthorized incoming and outgoing network traffic.
 - **Digital Signatures & Certificates:** Verifies the identity of online buyers and sellers.

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d) Entrepreneur Vs. Manager

Parameter	Entrepreneur	Manager
Primary Goal	Starts a new business around an innovative idea.	Manages and runs an existing business smoothly.
Risk	Assumes high financial and personal risk .	Takes no personal financial risk (salaried employee).
Reward	Earns business profits (can be high or zero).	Receives a fixed monthly salary and bonuses.
Focus	Focuses on innovation, growth, and long-term vision .	Focuses on daily operations, rules, and efficiency .

1. Define e-commerce. Write down the application of e-commerce..

E-Commerce (Electronic Commerce) is the process of buying, selling, transferring, or exchanging goods, services, and information electronically over the internet using digital devices such as computers, smartphones, and tablets.

2. Applications of E-Commerce (6 Marks)**1. Online Retailing (E-Tailing):**

- Digital stores and marketplaces where customers can browse, select, and buy physical products directly from home (e.g., Daraz, Amazon).

2. Electronic Banking & Financial Services:

- Enables online fund transfers, balance checks, and utility bill payments directly via mobile banking portals and ConnectIPS.

3. Digital Wallets & QR Payments:

- Software applications stored on mobile phones to scan merchant QR codes, top up mobile recharge, and pay bills instantly (e.g., eSewa, Khalti).

4. E-Procurement (B2B Buying):

- Allows corporations and government bodies to purchase raw materials, inventory, and office equipment online from suppliers in bulk.

5. Online Ticketing & Hospitality Booking:

- Instant online booking of airline tickets, bus seats, movie tickets, and hotel rooms without standing in physical queues.

6. Digital Advertising & Marketing:

- Promoting products using social media, search engine ads, and email campaigns to reach targeted customer groups.

2. Explain different business models of e-commerce.

An **E-Commerce Business Model** is a structural framework that defines how a company conducts business online, delivers value to customers, and generates revenue over the internet.

2. Key E-Commerce Business Models**1. B2C (Business-to-Consumer):**

- **Definition:** Businesses sell products or services directly to individual end-users for personal consumption.
- **Features:** Fast purchasing decisions, high order volume, smaller individual order value.

- **Example:** Buying clothing or electronics on **Daraz** or **Amazon**.

2. B2B (Business-to-Business):

- **Definition:** Commercial transactions occur directly between two businesses (e.g., manufacturers, wholesalers, and retailers).
- **Features:** Large bulk quantities, custom negotiations, high monetary value per order.
- **Example:** A store owner purchasing bulk inventory from a factory supplier on **Alibaba**.

3. C2C (Consumer-to-Consumer):

- **Definition:** Individual consumers buy and sell goods or services directly to other consumers using a third-party digital marketplace.
- **Features:** Second-hand items, peer-to-peer deals, direct user interaction.
- **Example:** Selling a used mobile phone or bicycle on **Hamrobazaar** or **eBay**.

4. C2B (Consumer-to-Business):

- **Definition:** Individual freelancers or content creators offer their skills, products, or services to commercial organizations.
- **Features:** Reverse auctioning, custom freelance work, remote projects.
- **Example:** A freelance developer building a web application for a company via **Fiverr** or **Upwork**.

5. B2G (Business-to-Government):

- **Definition:** Private companies provide specialized products, software, or infrastructure services to government organizations through online tenders.
- **Example:** A technology firm developing biometric software for the national identity office.

6. G2C (Government-to-Citizen):

- **Definition:** Government agencies deliver public administration services, licenses, and official documents directly to citizens online.
- **Example:** Applying for driving licenses or paying government taxes via the **Nagarik App**.

3. Define e-procurement. Discuss how EDI (Electronic Data Interchange) works.

E-Procurement (Electronic Procurement) is the B2B (Business-to-Business) process of purchasing goods, raw materials, equipment, and services online using internet-based software and digital networks.

2. How EDI (Electronic Data Interchange) Works .

Electronic Data Interchange (EDI) is the computer-to-computer exchange of standard business documents (like purchase orders, invoices, and shipping notices) directly between trading partners without human manual entry.

Step-by-Step EDI Working Process:

1. Document Preparation:

- The buyer generates a business document (e.g., a purchase order) using their internal computer software or ERP system.

2. Data Translation:

- EDI translation software converts this document into a standardized international EDI format (such as ANSI X12 or UN/EDIFACT) so both computers can understand it.

3. Secure Transmission:

- The formatted EDI document is transmitted securely over the internet or a private Value-Added Network (VAN) to the supplier's computer.

4. Receiving & Processing:

- The supplier's system receives the EDI file, translates it back into their internal system format, and automatically processes the order without manual typing.

5. Automatic Confirmation:

- The supplier's system automatically sends back an electronic acknowledgment or invoice to confirm order placement.

4. Discuss the issues related to the online marketing. Differentiate between online and offline marketing.

Issues Related to Online Marketing (4 Marks)

1. Security & Data Privacy Concerns:

- Customers fear sharing personal contact details and credit card info online due to risks of identity theft, hacking, and unwanted spam emails.

2. Lack of Physical Touch & Feel:

- Online buyers cannot physically inspect, try, or feel products before buying, leading to mistrust regarding product quality and higher product return rates.

3. High Competition & Ad Blocking:

- Millions of businesses run digital ads daily. Users often suffer from ad fatigue and use **Ad-Blocker software**, reducing ad visibility.

4. Technical Dependency & Infrastructure:

- Online marketing heavily relies on stable internet, server uptime, and digital literacy. Slow page loading speeds cause buyers to abandon shopping carts instantly.

2. Differentiate Between Online Marketing and Offline Marketing (4 Marks)

Feature / Basis	Online Marketing (E-Marketing)	Offline Marketing (Traditional)
Medium Used	Internet, Social Media (FB/Insta), Google Ads, Websites, Email.	Newspapers, Radio, TV commercials, Billboards, Pamphlets.
Audience Reach	Global Reach —target customers worldwide 24/7.	Local Reach —limited to a specific town or geographic region.
Cost Efficiency	Highly cost-effective; suitable for small budgets and startups.	Very expensive (e.g., printing billboards or TV ad slots).
Customer Interaction	Two-Way Interaction —customers can comment, chat, like, or give instant feedback.	One-Way Communication —customers only view or read without immediate feedback.
Measurability	Real-Time Tracking —track exact clicks, views, and conversions using analytics tools.	

5. What is wireless application protocol? Explain the security issues related to the wireless communication.

Wireless Application Protocol (WAP) is a technical standard and set of protocols that allows mobile wireless devices (like cell phones and handheld devices) to access the internet, view web pages, and access mobile banking/e-commerce services.

- **Purpose:** It acts as a bridge between the resource-limited mobile network and the World Wide Web by converting heavy web content into lightweight formats.

2. Security Issues Related to Wireless Communication (6 Marks)

Since wireless networks broadcast data over open radio waves rather than physical cables, they are inherently more vulnerable to cyber attacks:

1. Eavesdropping / Packet Sniffing:

- Hackers use specialized software to intercept unencrypted radio signals transmitted over public Wi-Fi or wireless networks to steal passwords, credit card numbers, and private messages.

2. Man-in-the-Middle (MitM) Attack:

- An attacker secretly positions themselves between a mobile user and a wireless gateway or router, intercepting and modifying financial or personal data in real time.

3. Rogue Access Points (Evil Twin Attack):

- Cybercriminals set up unauthorized, fake Wi-Fi hotspots (e.g., naming it "Free_Airport_WiFi") to trick users into connecting so they can record login credentials.

4. Signal Jamming / Denial of Service (DoS):

- Attackers flood wireless radio frequencies with radio interference or junk traffic to block legitimate users from connecting to the network.

5. WAP Gateway Security Hole (WAP Gap):

- When data travels between mobile devices and web servers via a WAP Gateway, encryption must be decrypted and re-encrypted. During this brief millisecond in the gateway memory, sensitive data is exposed in plain text.

6. Explain broadband technologies used in e-commerce.

Broadband Technologies Used in E-Commerce

1. FTTH / Fiber Optic Broadband:

- **Technology:** Uses thin strands of glass fibers to transmit data using light signals.
- **Use in E-Commerce:** Provides ultra-fast speeds (100 Mbps to 1 Gbps+) with very low latency. It is the backbone for e-commerce web servers, cloud databases, and corporate offices.
- *Example:* WorldLink, Subisu, or NT Fiber connections in Nepal.

2. **Wireless Broadband (4G / 5G LTE):**

- **Technology:** Delivers high-speed internet through cellular mobile towers over radio frequencies.
- **Use in E-Commerce:** Essential for **M-Commerce (Mobile Commerce)**, allowing consumers to buy products, scan QR codes, and make mobile wallet payments (eSewa/Khalti) from anywhere.

3. **DSL (Digital Subscriber Line):**

- **Technology:** Transmits digital data over traditional copper telephone lines without interrupting normal phone voice calls.
- **Use in E-Commerce:** Provides affordable wired internet for small online businesses and home shoppers.

4. **Cable Broadband:**

- **Technology:** Uses coaxial cables provided by cable TV networks to deliver high-speed internet.
- **Use in E-Commerce:** Used by residential customers and small retail shops for reliable web browsing and online shopping.

5. **Satellite Broadband:**

- **Technology:** Transmits internet signals directly from orbiting satellites in space to ground dish receivers.
- **Use in E-Commerce:** Connects buyers and sellers in remote/rural areas where physical fiber cables or cellular towers are not available.

3. **Why is Broadband Essential for E-Commerce?**

- **Instant Page Loading:** Prevents shopping cart abandonment caused by slow loading speeds.
- **Smooth Payment Processing:** Ensures payment gateways complete bank authorizations securely in seconds.
- **Rich Media Content:** Supports high-definition product images, 360-degree views, and live video shopping.

7. How can we provide internet security? Explain the types of software agents?

How can we provide internet security?

Internet security is maintained by protecting data, networks, and devices from unauthorized access or malicious attacks using several layers of defense:

- **Encryption:** Converts readable data into unreadable code during transmission.
- **Firewalls:** Monitor and filter incoming and outgoing network traffic based on rules.
- **Antivirus Software:** Scans, detects, and removes malicious software like malware and viruses.
- **Multi-Factor Authentication (MFA):** Requires two or more verification factors to gain access.
- **Regular Updates:** Patches software vulnerabilities to prevent exploits by hackers.
- **Secure Protocols:** Uses HTTPS and VPNs to secure connections over public networks.

Types of Software Agents

A software agent is an autonomous program that carries out tasks on behalf of a user or another program. They are classified based on their intelligence and behavior:

- **Simple Reflex Agents:** Respond immediately to distinct actions based on predefined if-then rules.
- **Model-Based Reflex Agents:** Maintain an internal state to track aspects of the current environment they cannot see.
- **Goal-Based Agents:** Combine environmental data with specific goal data to choose actions that achieve the objective.
- **Utility-Based Agents:** Evaluate the efficiency or "happiness" of a state to choose the most optimal action path.
- **Learning Agents:** Learn from past experiences over time to automatically improve their performance in new scenarios.

8. Define EPS. Explain the types of EPS (Electronic Payment System). Define EPS.

Electronic Payment System (EPS): A digital financial system that allows buyers to pay for goods and services over the internet without using physical cash or paper cheques.

2. Types of Electronic Payment Systems.

1. Payment Cards (Debit & Credit Cards):

- **Debit Card:** Deducts funds directly from your bank account instantly upon purchase.
- **Credit Card:** Allows borrowing money from the bank up to a set limit to pay now and settle later.

2. Digital Wallets (E-Wallets):

- Mobile software apps that store digital money to pay utility bills, buy tickets, and scan merchant QR codes (e.g., **eSewa, Khalti**).

3. Online / Net Banking:

- Direct banking portals and apps used to make instant inter-bank money transfers and pay online merchants (e.g., **ConnectIPS**).

4. Electronic Funds Transfer (EFT):

- Computer-based transfer of money directly between bank accounts without manual human intervention (e.g., ATM transfers, Wire Transfer).

5. Electronic Cheque (E-Cheque):

- A digital version of a paper cheque protected with encryption and digital signatures for safe clearing.

9. Define entrepreneurship. What are the necessary skills for being an entrepreneur.

- **Entrepreneurship:** The process of identifying a business opportunity, taking calculated financial risks, organizing resources, and launching a new business venture to solve problems and earn profit.

2. Necessary Skills for Being an Entrepreneur (6 Marks)

1. **Risk Management & Decision-Making:** Ability to calculate financial risks and make quick, firm decisions under pressure.
2. **Creativity & Innovation:** Capacity to introduce new products, unique services, or modern business models to the market.
3. **Financial Management:** Ability to manage capital, control operating costs, track cash flow, and secure funding.
4. **Leadership & Team Management:** Ability to inspire, guide, and manage employees to work towards a common goal.
5. **Communication & Sales Skills:** Ability to pitch ideas to investors, negotiate with suppliers, and sell products to customers.
6. **Technical & Digital Literacy:** Understanding modern technology and e-commerce tools to scale the business online.

10. Define e-commerce law. Explain taxation and encryption policies.

E-commerce law is the legal framework regulating online commercial activities. It governs internet transactions, digital contracts, data privacy, and consumer protection. It ensures trust and security in the digital marketplace.

Taxation Policies

Taxation policies dictate how governments collect revenue from online sales.

- **Jurisdiction:** Determines which country or state can tax an online transaction.
- **Nexus:** Defines the business presence required before a state can impose tax.
- **Digital Services Tax:** Taxes revenue generated from digital services like advertising and marketplaces.
- **Cross-Border Compliance:** Forces international sellers to follow local value-added tax (VAT) rules.

Encryption Policies

Encryption policies regulate how data is scrambled and secured during digital transmission.

- **Data Protection:** Mandates the use of protocols like SSL/TLS to protect consumer data.

- **Key Management:** Governs who holds the cryptographic keys to decrypt sensitive information.
- **National Security:** Balances user privacy rights with government access for law enforcement.
- **Compliance Standards:** Requires businesses to follow security frameworks like PCI-DSS for payments.

11. Write short notes on

a) Intellectual property

b) Digital wallet

c) Scope of electronic commerce

d) Entrepreneurship Vs. manager

A. Intellectual Property

- **Definition:** Intellectual Property (IP) refers to creations of the mind — inventions, literary and artistic works, designs, symbols, names, and images — that are legally protected.
- **Forms of IP:**
 - **Patents:** Protect inventions and processes.
 - **Copyrights:** Protect literary, artistic, and musical works.
 - **Trademarks:** Protect brand names, logos, and symbols.
 - **Trade Secrets:** Protect confidential business information.
- **Importance:**
 - Encourages innovation by granting exclusive rights.
 - Provides economic benefits to creators and businesses.
 - Prevents misuse or unauthorized reproduction.
- **Applications:** Technology companies patent new devices, authors protect books with copyright, and businesses secure logos with trademarks.
- **Challenges:** Piracy, counterfeiting, and enforcement across international borders.

b) Digital Wallet

- **Definition:** A digital wallet (or e-wallet) is a software application that securely stores payment information and passwords, enabling users to make electronic transactions.
- **Features:**
 - Stores credit/debit card details, loyalty cards, and coupons.
 - Supports contactless payments via NFC or QR codes.
 - Provides encryption and authentication for secure transactions.
- **Advantages:**
 - Convenience — eliminates the need to carry physical cards or cash.
 - Security — reduces risk of theft and fraud with encryption and biometrics.
 - Speed — enables instant transactions.
- **Examples:** PayPal, Google Pay, Apple Pay, and local e-wallets like eSewa in Nepal.
- **Applications:** Online shopping, bill payments, peer-to-peer transfers, and in-store purchases.
- **Challenges:** Cybersecurity risks, dependency on internet connectivity, and user awareness of fraud prevention.

c) Scope of Electronic Commerce

- **Definition:** Electronic commerce (e-commerce) refers to buying and selling goods and services over the internet.
- **Scope:**
 - **B2C (Business to Consumer):** Online retail platforms like Amazon.
 - **B2B (Business to Business):** Wholesale transactions between companies.
 - **C2C (Consumer to Consumer):** Platforms like eBay or OLX.
 - **C2B (Consumer to Business):** Freelancers offering services to companies.
- **Applications:** Online shopping, digital banking, e-learning, telemedicine, and government services.
- **Advantages:** Global reach, reduced costs, convenience, and scalability.
- **Challenges:** Security, trust, logistics, and digital divide.

D. Entrepreneurship Vs. manager

Entrepreneurship vs Manager

Aspect	Entrepreneur	Manager
Definition	An innovator who creates, organizes, and assumes risk to establish a new business venture.	A professional who plans, organizes, and controls resources to achieve organizational goals.
Focus	Innovation, opportunity recognition, and business creation.	Efficiency, stability, and resource optimization.
Risk	Takes high risks to achieve growth and success.	Minimizes risks and ensures smooth operations.
Goal	Establish new ventures, introduce new products/services.	Achieve organizational objectives within existing structures.
Approach	Visionary, creative, and opportunity-driven.	Administrative, systematic, and process-driven.
Decision Making	Quick, intuitive, often based on vision and opportunity.	Analytical, structured, based on data and procedures.
Reward	Profit, ownership, and recognition for innovation.	Salary, promotion, and recognition for performance.
Example	Elon Musk founding Tesla and SpaceX.	A corporate manager overseeing Tesla's production operations.

Question No. 1: Explain the applications of e-commerce. Discuss the scope of electronic commerce.

Part 1: Applications of E-Commerce.

1. **Online Retailing (E-Tailing):** Selling physical goods directly to end consumers through digital storefronts (e.g., **Daraz, Amazon**).
2. **Digital Banking & Financial Services:** Conducting instant fund transfers, balance checks, and utility bill clearing via banking portals.
3. **E-Procurement:** Automated B2B purchasing of raw materials, equipment, and bulk inventory between commercial enterprises.
4. **Online Ticketing & Booking:** Instant reservation of airline seats, bus tickets, movie shows, and hotel accommodations from home.
5. **Mobile Commerce (M-Commerce):** Performing transactions and QR code payments using handheld smartphones (e.g., **eSewa, Khalti**).

Part 2: Scope of Electronic Commerce.

1. **Global Market Reach:** Operates 24/7 without geographical boundaries or physical store limitations.
2. **Diverse Business Models:** Encompasses multiple trade channels including **B2B, B2C, C2C, C2B, and G2C**.
3. **Supply Chain Automation:** Integrates digital order tracking, inventory management, and automated supplier workflows.
4. **Digital Marketing & Customer Reach:** Uses targeted social media ads, search engines, and email campaigns to attract consumers.
5. **Fintech & Payment Infrastructure:** Incorporates encrypted payment gateways, digital wallets, e-cheques, and mobile banking.

Question No. 2: Differentiate between B2B and B2C e-commerce. Explain EDI. Differentiate Between B2B and B2C E-Commerce (4 Marks)

Parameter / Basis	B2B (Business-to-Business)	B2C (Business-to-Consumer)
Target Customer	Commercial organizations, wholesalers, and manufacturers.	Individual retail end-consumers for personal use.
Transaction Volume	Bulk quantities and very large order values.	Small quantities and individual item purchases.

Decision Cycle	Long and complex; involves multiple departmental approvals.	Fast, spontaneous, and emotion-driven impulse buying.
Pricing Model	Custom negotiated rates based on bulk order contracts.	Fixed retail prices displayed on public product catalog pages.
Payment Method	Credit lines, bank transfers, wire transfers, and e-cheques.	Debit/credit cards, mobile wallets, and cash on delivery (COD).
Relationship Focus	Long-term commercial partnerships and supply contracts.	Short-term transactional seller-buyer interactions.

2. Explain EDI (Electronic Data Interchange) (6 Marks)

a) Overview (3 Lines):

Electronic Data Interchange (EDI) is the computer-to-computer exchange of standard business documents (such as purchase orders, invoices, and shipping notices) directly between trading partners over secure networks without human manual entry or paper handling.

b) Working Process (Step-by-Step):

[Buyer System] —(Generates PO)—> [EDI Translator] —(ANSI X12 Standard)—> [VAN / Internet] —> [EDI Translator] —> [Supplier System]

1. **Document Generation:** Buyer creates an order in their internal ERP software.
2. **Translation:** EDI translator converts the file into standard format (e.g., ANSI X12 or UN/EDIFACT).
3. **Transmission:** File is transmitted securely across a Value-Added Network (VAN) or internet.
4. **Processing:** Supplier's system automatically translates and ingests the order into their database without manual typing.

c) Advantages & Limitations:

- **Advantages:** Eliminates paper costs, eliminates human data-entry errors, speeds up transaction cycles.
- **Limitations:** High initial setup cost, rigid standard requirements, requires technical expertise.

Question No. 3: Differentiate between online marketing and offline marketing. What are the issues with online marketing? Explain.

Differentiate Between Online Marketing and Offline Marketing

S.N. Parameter / Basis	Online Marketing (Digital Marketing)	Offline Marketing (Traditional Marketing)
1 Definition	Promotion of products and services using internet-based digital channels.	Promotion of products using traditional non-digital print and broadcast media.
2 Primary Mediums	Social media (FB/Insta), Google Ads, Websites, Email, and SEO.	Newspapers, Radio, TV commercials, Billboards, and Pamphlets.
3 Geographic Reach	Global Reach —targets consumers worldwide 24/7 without boundaries.	Local Reach —restricted to a specific geographic town or region.
4 Cost & Budget	Highly cost-effective; flexible budget suitable for startups.	Very expensive (high cost for printing, TV slots, and billboard space).
5 Communication	Two-Way Interaction —customers can comment, like, chat, or review instantly.	One-Way Communication —audiences only read or view without direct feedback.
6 Measurability	Real-Time Analytics —track exact impressions, clicks, and conversion rates.	Difficult to Measure —hard to determine exact sales driven by a billboard ad.

Issues Related to Online Marketing

Online marketing uses digital networks to reach targeted consumers efficiently. However, businesses face technical, security, and consumer psychological challenges that hinder conversion rates and brand reputation.

Issues:

- 1. Security & Data Privacy Concerns:** Consumers fear identity theft, credit card fraud, and unauthorized sharing of personal contact data.
- 2. Lack of Physical Touch & Feel:** Inability to physically inspect or test products leads to consumer hesitation and higher return rates.
- 3. Ad Fatigue & Ad-Blockers:** Excessive intrusive pop-up ads cause user annoyance, leading to widespread use of ad-blocking extensions.

4. **High Competition & Rising PPC Costs:** Saturated digital markets drive up Pay-Per-Click (PPC) advertising costs on search engines.
5. **Technical Dependency:** Server downtime, slow website load times, and broken payment links lead to instant shopping cart abandonment.

Question No. 4: Explain the growth of mobile commerce. Discuss generations in wireless communications.

Explain the Growth of Mobile Commerce

Mobile Commerce (M-Commerce) refers to buying, selling, and exchanging products and services wirelessly using handheld devices like smartphones and tablets. It represents an advanced evolution of e-commerce focused on mobility and instant access.

Key Drivers of M-Commerce Growth:

1. **Smartphone Penetration:** Widespread availability of low-cost smartphones and affordable high-speed mobile data.
2. **Digital Wallets & QR Payments:** One-tap payment integration via apps like eSewa, Khalti, and mobile banking.
3. **Location-Based Services (LBS):** GPS technology enables real-time delivery tracking, ride-hailing, and location-specific promo offers.
4. **App-First Shopping Experience:** Dedicated shopping mobile apps provide instant push notifications, personalized deals, and easy navigation.

: Discuss Generations in Wireless Communications (5 Marks)

Wireless Generation	Core Technology	Data Transmission Speed	Key Features & Services
1G	Analog Cellular System	Up to 2.4 kbps	Basic voice call services only; poor voice quality and zero security.
2G (GSM/CDMA)	Digital Cellular System	64 kbps to 144 kbps	Introduced text messaging (SMS), picture messaging, and basic encryption.
3G (UMTS/WCDMA)	Digital Packet Switched Data	384 kbps to 2 Mbps	Mobile web browsing, video calling, location services, and early m-commerce.
4G (LTE/WiMAX)	All-IP Broadband Network	100 Mbps to 1 Gbps	HD video streaming, smooth m-commerce apps, mobile gaming, and fast upload/download.
5G	Millimeter Wave & Massive MIMO	10 Gbps to 20 Gbps	Ultra-low latency (<1ms), IoT automation, smart cities, AR/VR shopping experiences.

Question No. 5: Explain the role of network infrastructure of e-commerce.

Define: (a) TCP (b) ISP (c) Wi-Fi.

Part 1: Role of Network Infrastructure in E-Commerce (5 Marks)

Network infrastructure is the underlying hardware and software framework—including routers, switches, communication links, servers, and protocols—that enables secure, uninterrupted digital data transfer between shoppers, e-commerce portals, and payment gateways.

Key Roles in E-Commerce:

1. **24/7 Availability & Uptime:** Ensures e-commerce storefronts remain continuously operational and accessible globally.
2. **Fast Transaction Speed:** High-bandwidth infrastructure delivers fast page loading and real-time payment clearance.
3. **Data Security & Privacy:** Integrates firewalls, VPNs, and SSL/TLS encryption to protect sensitive payment data in transit.
4. **Scalability:** Enables servers to automatically handle sudden traffic spikes during festival sales without crashing.

Define Terms

(a) TCP (Transmission Control Protocol):

TCP is a foundational connection-oriented Transport Layer protocol that breaks web data into packets, ensures reliable packet delivery in exact order, and retransmits lost packets between client browsers and e-commerce web servers.

(b) ISP (Internet Service Provider):

An ISP is a commercial telecommunications organization (e.g., **Nepal Telecom, WorldLink**) that provides individuals and commercial enterprises with wired or wireless internet connectivity, IP address allocation, and access to the global internet backbone.

(c) Wi-Fi (Wireless Fidelity):

Wi-Fi is a popular wireless networking technology based on the **IEEE 802.11** standards that uses high-frequency radio waves to connect mobile phones, laptops, and smart devices to a local network and internet gateway without physical network cables.

Question No. 6: Define electronic payment system. Explain its types. Discuss online banking facilities provided by banks in Nepal.

1. Define Electronic Payment System (2 Marks)

An **Electronic Payment System (EPS)** is a financial framework that allows buyers to securely transfer monetary value over the internet to sellers for goods and services

without using physical cash or paper cheques, using encrypted computer networks and banking gateways.

2. Types of Electronic Payment Systems (4 Marks)

1. Payment Cards (Debit & Credit Cards):

- **Debit Card:** Deducts funds directly and instantly from the buyer's bank account upon checkout.
- **Credit Card:** Allows borrowing money from an issuing bank up to a credit limit to settle purchases later.

2. Digital Wallets (E-Wallets):

- Mobile software applications storing digital money for instant QR code merchant payments, mobile recharges, and utility bill clearing (e.g., **eSewa, Khalti, IME Pay**).

3. Online / Net Banking:

- Direct internet banking portals enabling electronic inter-bank fund transfers and online merchant checkouts (e.g., **ConnectIPS**).

4. Electronic Funds Transfer (EFT):

- Direct computer-to-computer money transfers between accounts across national or international banking networks (e.g., Wire Transfers, ATMs).

3. Online Banking Facilities Provided by Banks in Nepal (4 Marks)

1. **Inter-Bank Fund Transfer (IBFT):** Instant transfer of money from one commercial bank account to another 24/7 using **ConnectIPS** or mobile banking apps.
 2. **Utility Bill Payments:** Instant payment of electricity (NEA), water (KUKL), landline/internet, and TV subscription bills from mobile phones.
 3. **QR Code Merchant Payments:** Scanning **Fonepay** or **NepalQR** codes at local shops, restaurants, and retail outlets for instant cashless checkout.
 4. **Government Tax & Fee Clearing:** Paying vehicle tax, passport fees, Lok Sewa application fees, and revenue tax directly to government accounts.
-

Question No. 7: Differentiate between entrepreneur and entrepreneurship. What are the characteristics of a successful entrepreneur? [5 + 5 = 10 Marks]

Part 1: Differentiate Between Entrepreneur and Entrepreneurship (5 Marks)

S.N.	Parameter / Basis	Entrepreneur (Person / Actor)	Entrepreneurship (Process / Action)
1	Definition	An individual who identifies a business opportunity, takes financial risks, and establishes a commercial enterprise.	The complete process of identifying opportunities, gathering resources, and managing risk to build a new business venture.
2	Nature	Concrete entity —a physical person, founder, or business creator.	Abstract concept —a systematic process, strategy, and business discipline.
3	Role	Acts as an innovator, leader, risk-taker, and decision-maker.	Represents the administrative and creative activity of innovation and execution.
4	Focus	Focused on vision, team management, and strategic direction.	Focused on planning, organizing, financing, and scaling operations.
5	Outcome	Creates an enterprise, company, or commercial brand.	Generates business growth, job creation, and economic value.
6	Risk Relationship	The individual who personally bears the financial loss if the business fails.	The operational risk management framework applied to minimize business losses.
7	Visual Analogy	The Driver navigating the car.	The Driving Process and journey itself.
8	Example	Mahavir Pun or Upendra Mahato .	The act of founding a wireless tech initiative or launching a venture.

characteristics of a Successful Entrepreneur (5 Marks)

1. **Calculated Risk-Taking:** Ability to evaluate potential financial risks and make bold decisions under market uncertainty.
2. **Creativity & Innovation:** Capacity to introduce unique products, innovative services, or disruptive business models to satisfy customer needs.

3. **Resilience & Perseverance:** Determination to overcome initial business failures, market crashes, and economic setbacks without giving up.
4. **Leadership & Vision:** Ability to inspire team members, set clear long-term goals, and guide organizational growth.
5. **Financial Discipline:** Strong skills in managing capital, controlling operating budgets, and maintaining positive cash flow.

Question No. 8: Explain taxation. Explain legal and ethical issues of e-commerce. : Explain Taxation in E-Commerce.

Taxation in e-commerce refers to the government laws and regulatory frameworks that enforce the collection of Value Added Tax (VAT), custom duties, and sales tax on digital transactions and physical goods bought online.

b) Key Provisions:

1. **Digital Service Tax (DST):** Direct tax imposed on foreign digital platforms (e.g., Netflix, Facebook ads) earning revenue within Nepal.
2. **PAN/VAT Registration:** Mandates local e-commerce sellers to register with the Inland Revenue Department (IRD) and issue electronic tax invoices.

Legal and Ethical Issues of E-Commerce (7 Marks)

1. Legal Issues (4 Marks)

1. **Intellectual Property (IP) Theft:** Unauthorized copying of website design code, trademarked logos, or selling counterfeit products online.
2. **Electronic Contract Enforcement:** Disputes over the validity of click-through online agreements, refund terms, and minor purchases without parental consent.
3. **Domain Name Squatting (Cybersquatting):** Registering internet domain names identical to famous trademarked brand names to sell them back at inflated prices.
4. **Jurisdictional Conflicts:** Difficulty in enforcing local consumer protection laws when a customer buys goods from a foreign seller based overseas.

2. Ethical Issues (3 Marks)

1. **Consumer Privacy Invasion:** Tracking user browsing cookies and selling personal search behavior data to third-party ad networks without user knowledge.
2. **Misleading Digital Advertising:** Displaying doctored product photos, fake positive reviews, or hidden shipping costs at final checkout.
3. **Web Crawling & Data Scraping:** Unethically copying product catalogs and pricing databases from competitor websites without authorization.

Question No. 9: Write short notes on (Attempt Any TWO)

a) Software Agents

- **Overview (3 Lines):** A Software Agent is an autonomous computer program that performs routine tasks, gathers information, or executes background internet operations automatically on behalf of a user without requiring continuous human interaction.
- **Working & Key Types:**
 - **Shopping Bots / Buyer Agents:** Automatically scans multiple e-commerce web portals to compare product prices, features, and delivery times.
 - **Monitoring Agents:** Continuously monitors website health, server uptime, and alerts systems about security breaches.
- **Example:** Price-comparison bots on travel booking portals.

b) Entrepreneurship Development

- **Overview (3 Lines):** Entrepreneurship Development is a structured process of cultivating managerial skills, financial capabilities, and an innovative mindset in aspiring individuals through formal training programs, incubation centers, and government schemes.
- **Key Components:**
 1. **Motivation & Ideation:** Training candidates to spot market gaps and develop innovative business plans.
 2. **Financial Literacy:** Guidance on securing seed capital, managing cash flow, and banking procedures.
 3. **Incubation Support:** Providing office infrastructure, technical tools, and mentorship during early startup stages.

c) E-Procurement

- **Overview (3 Lines):** E-Procurement (Electronic Procurement) is the B2B requisitioning, purchasing, and ordering of goods, raw materials, and commercial services electronically over the internet using specialized e-sourcing software and Electronic Data Interchange (EDI).
- **Working & Advantages:**
 - **Process:** Requisitions are created digitally, sent for automated approval, matched with electronic supplier invoices, and settled online.
 - **Advantages:** Eliminates paper processing costs, accelerates supply chain speed, and prevents human data entry errors.

Regular/Back Exam - 2080 Magh/Phagun

Program: Diploma in Computer Engineering

Question No. 1: Explain e-business. Write the advantages and disadvantages of e-commerce. [4 + 6 = 10 Marks]

1. Explain E-Business (4 Marks)

E-Business (Electronic Business) refers to the comprehensive transformation of all core business processes—including internal administrative workflows, supply chain management, customer relationship management, and digital trading—using internet technologies and electronic communication channels.

Key Features:

- Integrates internal enterprise systems (ERP) with external customer-facing web stores.
- Covers both monetary transactions and non-monetary business activities (e.g., online staff training, inventory tracking).
- Streamlines corporate operations by replacing physical paper documentation with automated digital workflows.

2. Advantages and Disadvantages of E-Commerce (6 Marks)

a) Advantages of E-Commerce:

1. **Global Reach & 24/7 Availability:** Businesses can sell products worldwide round-the-clock without physical geographic limits.
2. **Reduced Operational Costs:** Eliminates expensive brick-and-mortar retail rents, utility bills, and large physical sales teams.
3. **Automated Order Processing:** Real-time order tracking, digital inventory management, and instant payment confirmation.
4. **Targeted Customer Marketing:** Uses browsing behavior analytics to show personalized recommendations and custom deals.

b) Disadvantages of E-Commerce:

1. **Lack of Physical Touch & Feel:** Customers cannot inspect, feel, or try on products before buying, leading to higher return rates.
2. **Cyber Security & Privacy Risks:** Threat of credit card theft, phishing scams, and unauthorized personal data hacking.
3. **Delivery Delays & Shipping Costs:** Physical delivery takes time and involves extra shipping or customs fees.
4. **Technical Dependency:** Server crashes, slow website speeds, or payment gateway outages directly halt business sales.

Question No. 2: What is business model? Explain its type with suitable example.
[2 + 8 = 10 Marks]

1. What is a Business Model?

A **Business Model** is an architectural framework that describes how a commercial enterprise creates, delivers, and captures value electronically over digital networks. It outlines product flows, target customer segments, revenue streams, and market delivery channels.

2. Types of E-Commerce Business Models (8 Marks)

1. B2B (Business-to-Business):

- **Concept:** Commercial transactions conducted exclusively between two corporate entities (wholesalers, manufacturers, and distributors).
- **Example:** A clothing brand purchasing bulk raw fabric from a manufacturer on **Alibaba**.

2. B2C (Business-to-Consumer):

- **Concept:** Online retail platforms selling goods and services directly to individual end-consumers for personal use.
- **Example:** An individual customer purchasing a laptop or shoes on **Daraz**.

3. C2C (Consumer-to-Consumer):

- **Concept:** Digital marketplaces that allow individual private consumers to sell second-hand goods or services directly to other consumers.
- **Example:** A user selling their used smartphone or vehicle on **Hamrobazaar** or **eBay**.

4. C2B (Consumer-to-Business):

- **Concept:** Private consumers offering creative services, freelance work, or custom digital assets to commercial businesses.
- **Example:** A freelance graphic designer selling custom logos or stock photos on **Fiverr** or **Upwork**.

5. G2C / C2G (Government-to-Citizen):

- **Concept:** Digital public service portals where citizens clear taxes, apply for official documents, and pay utility bills electronically.
- **Example:** Paying vehicle tax or passport application fees on government portals via **ConnectIPS**.

Question No. 3: What is I-way? Describe the components of I-way. What are the types of software agent? [2 + 4 + 4 = 10 Marks]

1. What is I-Way?

The **Information Superhighway (I-Way)** is a high-speed, high-capacity multimedia telecommunications network framework that integrates telephone, cable TV, wireless, and computer networks to transport text, audio, video, and e-commerce data globally.

2. Components of I-Way (4 Marks)

a) Architecture Diagram:

b) Key Components:

1. **Consumer Access Equipment:** Client-side hardware devices used by shoppers to access the web (e.g., smartphones, laptops, smart TVs, POS terminals).
2. **Local Access (Last Mile) Networks:** Communication links connecting home/office users to network hubs (e.g., fiber optics, cable TV lines, cellular 4G/5G, Wi-Fi).
3. **Global Transport Backbones:** High-speed national and international core data highways (e.g., undersea fiber optic cables, satellite links, high-speed core routers).
4. **Information Service Providers:** Platforms hosting e-commerce applications, multimedia servers, and online payment clearing gateways.

3. Types of Software Agents (4 Marks)

1. Buyer Agents (Shopping Bots):

- Automatically crawls multiple e-commerce websites to compare product prices, features, and shipping fees for the buyer.

2. User / Personal Agents:

- Learns individual user preferences to automatically filter emails, set calendar alerts, and autofill checkout forms.

3. Monitoring & Surveillance Agents:

- Continuously tracks web server performance, inventory levels, and network health, alerting admins to security breaches.

4. Data Mining / Recommendation Agents:

- Analyzes customer browsing patterns and past purchase history to suggest personalized product recommendations.

Question No. 4: Define EDI and its applications. Explain security and privacy issues of EDI. [2 + 4 + 4 = 10 Marks]

1. Define EDI (2 Marks)

Electronic Data Interchange (EDI) is the computer-to-computer exchange of structured commercial business documents (such as purchase orders, invoices, and shipping notices) directly between trading partners over secure networks using standardized formats without manual human intervention.

2. Applications of EDI (4 Marks)

1. **Automated E-Procurement:** Automatic transmission of digital purchase orders (POs) from a buyer's ERP system to a supplier's inventory system.
2. **Supply Chain Management:** Real-time tracking of bulk shipment notices, bills of lading, and delivery confirmations between manufacturers and carriers.
3. **Electronic Financial Invoicing:** Direct transmission and instant clearing of electronic tax invoices, credit notes, and payment receipts.
4. **Inventory Management:** Automated stock-level alerts sent to suppliers to trigger Just-In-Time (JIT) stock replenishment.

3. Security and Privacy Issues of EDI (4 Marks)

1. **Data Interception & Tampering:** Vulnerability to unauthorized interception or modification of sensitive corporate order files during transit over public networks.
 2. **Unauthorized Access & Identity Theft:** Risk of malicious actors forging sender identities to submit fake high-value commercial orders.
 3. **Non-Repudiation Risks:** Disputes where a trading partner denies placing or receiving an electronic purchase contract.
 4. **Privacy Leaks of Commercial Data:** Exposure of sensitive pricing agreements, supplier lists, or trade secrets to business competitors.
 5. **Security Countermeasures:** Resolved using **Public Key Cryptography (PKI)**, digital signatures, and encrypted Value-Added Networks (VANs).
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Question No. 5: Define M-commerce. Write its applications. Explain mobile commerce architecture.

1. Define M-Commerce (2 Marks)

Mobile Commerce (M-Commerce) refers to buying, selling, transferring funds, and conducting commercial transactions wirelessly using handheld smartphones and tablets over mobile cellular broadband networks.

2. Applications of M-Commerce (4 Marks)

1. **Mobile Banking & Digital Wallets:** QR code merchant payments, mobile fund transfers, and bill payments via apps like **eSewa, Khalti, and ConnectIPS**.
 2. **App-Based Shopping:** Purchasing physical products directly through dedicated retail mobile apps (e.g., **Daraz, Amazon**).
 3. **Location-Based Services (LBS):** Booking real-time ride-hailing services (e.g., Pathao, InDrive), food delivery, and receiving location-based discount alerts.
 4. **Mobile Ticketing:** Reserving and storing digital QR tickets for airlines, bus travel, movie theaters, and concerts directly on smartphones.
-

3. Mobile Commerce Architecture (4 Marks)

1. **Application Layer:** User interface consisting of native mobile shopping apps, mobile web browsers, and digital payment wallets.
2. **Messaging & Middleware Layer:** Protocols facilitating communication between mobile devices and web servers (e.g., WAP, HTTP, SMS, USSD).
3. **Security Layer:** Handles data encryption, biometrics (Fingerprint/Face ID), and secure socket communication (WTLS, SSL/TLS).
4. **Network Transport Layer:** Wireless communication infrastructure carrying data packets (e.g., 4G LTE, 5G, Wi-Fi networks).
5. **Hardware Layer:** Client mobile hardware (smartphones, tablets, SIM cards, POS terminals).

Q.N. 6: What is cryptography and explain its types. Differentiate between digital certificate and digital signature. [5 + 5 = 10]

Definition of Cryptography

Cryptography is the science of protecting information by converting readable data (plain text) into unreadable form (cipher text) using mathematical techniques so that only authorized users can access it.

Types of Cryptography

1. Symmetric Key Cryptography (Secret Key): Same key is used for both encryption and decryption. Fast but key sharing is risky. Example: DES, AES, Blowfish.

2. Asymmetric Key Cryptography (Public Key): Uses a pair of keys — public key (for encryption) and private key (for decryption). More secure but slower. Example: RSA, ECC, Diffie-Hellman.

3. Hash Function (One-Way Cryptography): Converts data into a fixed-length hash value; cannot be reversed. Used for integrity check. Example: MD5, SHA-1, SHA-256.

Difference between Digital Certificate and Digital Signature

S.N.	Basis	Digital Certificate	Digital Signature
1	Definition	Electronic document that verifies the identity of a person, organization, or website.	Mathematical technique that verifies the authenticity of a digital message or document.
2	Purpose	Provides identity proof of the owner.	Provides authentication, integrity, and non-repudiation of data.
3	Issued By	Issued by Certifying Authority (CA) like VeriSign, DigiCert.	Created by the sender using their private key.
4	Contents	Public key, owner's name, expiry date, CA's signature, serial number.	Encrypted hash value of the message using sender's private key.
5	Uses	Uses cryptographic keys but not created by keys — it is a certificate file.	Uses asymmetric cryptography (private and public key pair).

Q.N. 7: What are the e-commerce security issues? Explain the types and functions of firewall. [4 + 6 = 10]

E-Commerce Security Issues

- 1. Confidentiality:** Preventing unauthorized access to personal and financial data of customers.
- 2. Integrity:** Ensuring that data (like transaction details) is not altered during transmission.
- 3. Authentication:** Verifying identity of buyers and sellers to prevent fake users.
- 4. Non-Repudiation:** Sender cannot deny sending and receiver cannot deny receiving a transaction.
- 5. Availability:** Services should be available 24×7; DoS attacks affect availability.
- 6. Hacking & Phishing:** Attackers steal login details and credit card information using fake sites/emails.
- 7. Virus & Malware Attacks:** Malicious software can corrupt data and damage e-commerce servers.
- 8. Payment Frauds:** Credit card frauds, identity theft, and fake transactions cause financial loss.

Firewall — Definition

A Firewall is a hardware or software security system that monitors and controls incoming and outgoing network traffic based on predefined security rules

Types of Firewall

- 1. Packet Filtering Firewall:** Checks each data packet's source, destination, and port. Allows or blocks based on rules. Fast but less secure.
- 2. Stateful Inspection Firewall:** Tracks the state of active connections and makes decisions based on context. More secure than packet filter.
- 3. Proxy Firewall (Application Gateway):** Works at application layer; acts as intermediary between user and internet. Hides internal network.
- 4. Circuit-Level Gateway:** Works at session layer; verifies TCP handshake but does not inspect packet content.
- 5. Next-Generation Firewall (NGFW):** Combines traditional firewall with deep packet inspection, intrusion prevention, and antivirus.

Functions of Firewall

- Controls and monitors incoming and outgoing network traffic.
- Blocks unauthorized access to the internal network.
- Protects the system from viruses, worms, and malware.
- Prevents hacking attacks such as DoS and IP spoofing.

Q.N. 8: Differentiate between entrepreneur and manager. Explain the characteristics of successful entrepreneur. [5 + 5 = 10]

Difference between Entrepreneur and Manager

S.N.	Basis	Entrepreneur	Manager
1	Meaning	Person who starts and owns a new business by taking risk.	Person who runs day-to-day operations of an existing business.
2	Motive	Innovation, creation, and profit maximization.	Smooth running and achieving organizational goals.
3	Risk	Bears full financial and business risk.	Does not bear direct risk; risk is on the owner.
4	Reward	Gets profit (uncertain and variable).	Gets fixed salary and incentives.
5	Role	Owner, decision maker, and founder of the business.	Employee who executes the plans of the owner.
6	Decision Making	Makes strategic and creative decisions.	Makes operational and routine decisions.

Characteristics of Successful Entrepreneur

- 1. Vision:** Has clear vision and long-term goals for business.
- 2. Innovative:** Constantly comes up with new ideas, products, or services.
- 3. Risk-Taker:** Willing to take calculated risks in uncertain situations.
- 4. Hard Working:** Dedicated, disciplined and works long hours.
- 5. Self-Confident:** Believes in own ability to succeed.
- 6. Leadership:** Motivates and leads team towards business goals.
- 7. Decision Making:** Takes quick and effective decisions.
- 8. Opportunity Seeker:** Identifies and grabs new business opportunities.
- 9. Problem Solver:** Solves problems creatively during difficult times.
- 10. Ethical & Responsible:** Runs business honestly and takes social responsibility.

Q.N. 9: Write short notes on (Attempt Any TWO): [2 × 5 = 10]

(a) Digital Wallet

A Digital Wallet (E-Wallet) is a software-based online payment system that stores users' payment information (credit/debit cards, bank details) and passwords securely to make electronic transactions easily and quickly through smartphones or computers.

Key Features:

Stores multiple cards and bank accounts in one place.

Uses encryption and PIN/biometric security.

Supports QR code and NFC payments.

Allows peer-to-peer money transfer.

Examples: eSewa, Khalti, IME Pay, Google Pay, Paytm.

(b) SSL (Secure Sockets Layer)

SSL (Secure Sockets Layer) is a standard security protocol that establishes an encrypted link between a web server and a browser to protect sensitive data such as login credentials, credit card numbers, and personal information during online transactions.

Key Points:

Uses public key and private key cryptography (asymmetric).

Websites using SSL show 'https://' and a padlock icon.

Provides encryption, authentication, and data integrity.

SSL Certificate is issued by Certifying Authority (CA).

Now upgraded to TLS (Transport Layer Security).

(c) Aims of Cyber Law

Cyber Law is the branch of law that deals with legal issues related to the use of computer, internet, and digital technology. In Nepal, cyber activities are regulated by the Electronic Transaction Act (ETA), 2063.

Main Aims of Cyber Law:

To provide legal recognition to electronic documents, records, and digital signatures.

To prevent and control cybercrimes such as hacking, phishing, and cyber fraud.

To protect privacy and personal data of internet users.

To promote and secure e-commerce and e-governance activities.

To protect intellectual property rights (copyright, trademark) on the internet.

To provide punishment for cyber offences and ensure justice to victims.

(d) Online Marketing vs Offline Marketing

S.N.	Basis	Online Marketing	Offline Marketing
1	Meaning	Marketing done through internet and digital media.	Marketing done through traditional physical channels.
2	Medium	Websites, social media, email, mobile apps, search engines.	TV, radio, newspaper, magazine, billboard, pamphlets.
3	Reach	Global reach — anywhere in the world.	Limited to local or regional area.
4	Cost	Comparatively low cost.	Comparatively high cost.
5	Speed	Very fast — instant campaigns and results.	Slower — takes time to plan and reach.
6	Interaction	Two-way interactive communication with customers.	One-way communication mostly.

Regular/Back Exam-2080, Magh/Falgun

Program: Diploma in IT Engineering

Q1. Define E-commerce. Write down the scope of E-commerce. [8 marks]

Definition of E-commerce:

E-commerce (Electronic Commerce) is the process of buying and selling of goods, services, and information over the internet or other electronic networks. It involves online transactions, electronic payments, and digital communication between buyers and sellers without physical presence.

Scope of E-commerce:

Business-to-Business (B2B): Trading between two businesses electronically, e.g., Alibaba, IndiaMART.

Business-to-Consumer (B2C): Direct selling of products/services to end customers, e.g., Amazon, Daraz.

Consumer-to-Consumer (C2C): Consumers sell to other consumers via platforms, e.g., eBay, OLX.

Consumer-to-Business (C2B): Individuals offer products/services to businesses, e.g., freelancers on Upwork.

Online Banking & Payments: Fund transfer, bill payment, mobile banking through eSewa, Khalti, PayPal.

Online Marketing & Advertising: Digital promotion through social media, email marketing, SEO.

Supply Chain Management: Managing procurement, inventory, and logistics through online systems.

Online Education & E-Learning: Delivery of courses and training via internet, e.g., Coursera, Udemy.

E-Government Services: Online public services like tax filing, license renewal, e-passport.

Digital Products & Services: Selling software, music, e-books, streaming content online.

Q2. Explain Electronic Data Interchange (EDI). [8 marks]

Electronic Data Interchange (EDI) is the computer-to-computer exchange of business documents in a standard electronic format between business partners. It replaces paper-based documents such as purchase orders, invoices, and shipping notices with electronic equivalents, enabling faster and error-free communication.

Features of EDI:

- Uses standard formats like ANSI X12, EDIFACT, and XML.
- Enables direct computer-to-computer communication without human involvement.
- Reduces paperwork, manual errors, and processing time.
- Ensures secure and reliable data transmission between trading partners.

Working of EDI:

1. Sender prepares business document (invoice, PO) in the internal system.
2. The document is translated into standard EDI format using EDI translator software.
3. Data is transmitted through Value Added Network (VAN) or Internet (AS2).
4. Receiver's EDI translator converts the standard format back into internal format.
5. Receiver's application processes the document automatically.

Advantages of EDI:

- Faster transactions and reduced processing time.
- Cost savings by eliminating paper, printing, and postage.

Limitations of EDI:

- High initial setup and implementation cost.
- Requires standardization between trading partners.

Q3. Define online marketing. Write down the use of e-advertisement and browsing behavior in e-marketing. [2+6] [8 marks]

Definition of Online Marketing:

Online marketing (or e-marketing) is the process of promoting and selling products or services through the internet using digital channels such as websites, search engines, social media, and email to reach and engage customers.

- **Use of E-Advertisement in E-Marketing:**
- **Wider Reach:** E-ads reach global audiences 24/7 without geographical limits.
- **Cost-Effective:** Cheaper than traditional print/TV ads with better ROI.
- **Targeted Advertising:** Ads shown based on user's age, location, interest, and behavior.
- **Measurable Results:** Impressions, clicks, and conversions can be tracked using analytics.
- **Interactive Content:** Includes videos, banners, pop-ups, and clickable links.
- **Brand Awareness:** Increases visibility and recognition of products/services.
- **Use of Browsing Behavior in E-Marketing:**
- **Customer Profiling:** Analyzing pages visited helps understand customer preferences.

Q4. Explain the types of electronic payment system. [8 marks]

Electronic Payment System (EPS) is a mode of payment for online transactions where money is transferred digitally between buyer and seller through electronic networks without using physical cash.

Types of Electronic Payment System:

- 1. Credit Card Payment:** A card issued by bank allowing users to borrow funds for purchases and pay later. Widely accepted for online shopping (Visa, MasterCard).
- 2. Debit Card Payment:** Card linked directly to user's bank account. Amount is deducted immediately during transaction. Safer than credit card for online use.
- 3. Electronic Cash (E-Cash / Digital Cash):** Digital version of physical currency stored on user's device or server. Used for small anonymous transactions.
- 4. Electronic Cheque (E-Cheque):** Digital equivalent of a paper cheque. Sent electronically, verified, and cleared through banking network.
- 5. Smart Card Payment:** Plastic card with embedded microchip storing user's financial information. Used in contactless payments and metro cards.
- 6. Mobile Wallet / Digital Wallet:** Software-based system storing payment info in mobile devices. Examples: eSewa, Khalti, Google Pay, PayPal.

7. Internet Banking: Bank services accessed via internet for fund transfer, bill payment, and account management.

Q5a. How can you manage Customer Relationship Management (CRM)? [8]

Definition of CRM:

Customer Relationship Management (CRM) is a business strategy and technology used by organizations to manage and analyze customer interactions and data throughout the customer lifecycle, aiming to improve customer service, retention, and drive sales growth.

Steps to Manage CRM:

- 1. Collect Customer Data:** Gather customer information from websites, forms, surveys, social media, and purchase history.
- 2. Segment Customers:** Group customers based on demographics, behavior, preferences, and purchase patterns.
- 3. Use CRM Software:** Implement tools like Salesforce, Zoho, HubSpot to store and manage customer data.
- 4. Personalize Communication:** Send personalized emails, offers, and recommendations based on customer profile.
- 5. Provide Excellent Customer Support:** Offer 24/7 support through chatbots, email, phone, and social media.
- 6. Track Customer Interactions:** Record every touchpoint - calls, emails, chats, purchases for better understanding.
- 7. Analyze Feedback:** Use surveys and reviews to identify areas of improvement.
- 8. Build Loyalty Programs:** Offer discounts, reward points, and exclusive benefits to retain customers.

Q5(b). Explain consumer-oriented application.

Consumer-oriented applications are e-commerce applications designed to serve the needs of individual consumers by providing them with products, services, and information through online platforms directly.

Types / Examples of Consumer-Oriented Applications:

- 1. Online Shopping / Retail:** Buying products online from websites like Amazon, Flipkart, Daraz. Users browse, compare, and purchase goods from home.
- 2. Online Banking:** Access to banking services like fund transfer, bill payment, and balance inquiry via internet or mobile app.
- 3. Online Ticket Booking:** Reservation of movie, bus, train, and flight tickets through platforms like BookMyShow, MakeMyTrip.
- 4. Online Education / E-Learning:** Access to courses, lectures, and study material through Coursera, Udemy, Khan Academy.
- 5. Online Entertainment:** Streaming movies, music, and games on Netflix, YouTube, Spotify.

Q6. Define e-commerce law. Explain about internet indecency and censorship.

Definition of E-commerce Law:

E-commerce law refers to the set of legal rules and regulations that govern electronic transactions, online business activities, digital contracts.

Internet Indecency:

Internet indecency refers to the publication, distribution, or display of obscene, vulgar, pornographic, or offensive content on the internet that violates public morality, decency, and social values.

Examples of Internet Indecency:

- Pornographic websites and adult content.
- Cyberbullying and hate speech.
- Sharing of violent, obscene images or videos.
- Online harassment and defamation.

Internet Censorship:

Internet censorship is the control or suppression of what can be accessed, published, or viewed on the internet by government authorities, ISPs, or institutions to restrict harmful, illegal, or sensitive content.

Types of Internet Censorship:

- Government Censorship - blocking political or sensitive websites.
- Corporate Censorship - filtering content within organizations.
- Religious/Moral Censorship - restricting content against culture.
- Self-Censorship - individuals restrict their own content.

Need of Censorship:

- To protect national security.
- To prevent cybercrime and terrorism.
- To protect children from harmful content.
- To maintain social and moral values.

Q7. Explain the architecture of Wireless Application Protocol (WAP). [8 marks]

Wireless Application Protocol (WAP) is a set of communication protocols that enables mobile devices such as mobile phones and PDAs to access the internet and web-based services wirelessly.

Architecture / Layers of WAP:

The WAP architecture consists of five layers, similar to the OSI model, which work together to enable wireless communication:

1. Application Layer (WAE - Wireless Application Environment):

Provides an environment for developing wireless applications. Includes WML (Wireless Markup Language) and WMLScript for creating content for mobile devices.

2. Session Layer (WSP - Wireless Session Protocol):

Manages sessions between client and server. Supports both connection-oriented and connectionless services. Similar to HTTP.

3. Transaction Layer (WTP - Wireless Transaction Protocol):

Handles reliable transactions between client and server. Provides three classes of service - unreliable, reliable one-way, and reliable two-way.

4. Security Layer (WTLS - Wireless Transport Layer Security):

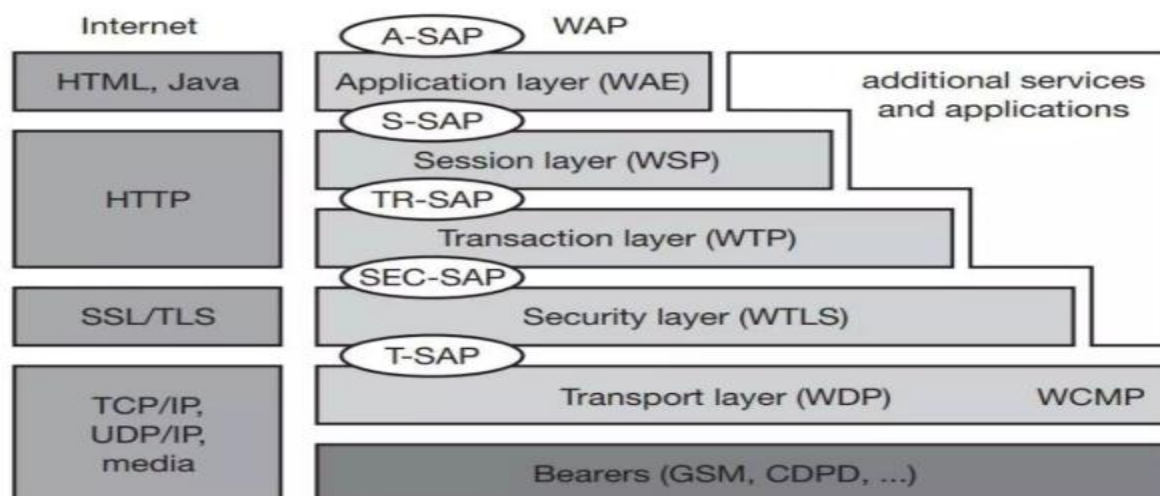
Provides data security, privacy, and authentication. Similar to SSL/TLS but optimized for wireless environment.

5. Transport Layer (WDP - Wireless Datagram Protocol):

Provides consistent data format to upper layers. Works with different bearer services like GSM, CDMA, GPRS.

Diagram - WAP Architecture:

WAP Architecture



Q8. Explain mercantile process model with example. [8 marks]

The Mercantile Process Model is a framework that describes the interaction and flow of activities between a consumer and a merchant during an e-commerce transaction. It defines all the steps from product discovery to post-purchase support.

Phases of Mercantile Process Model:

1. Pre-Purchase Phase (Preparation):

Consumer searches for products, compares prices, reads reviews, and evaluates alternatives

2. Purchase Consummation Phase:

Consumer places order, chooses payment method, provides delivery details, and confirms purchase. Merchant verifies details and processes the payment.

3. Post-Purchase Phase (Delivery and Service):

Merchant delivers the product, provides after-sales services like warranty, returns, and customer support. Consumer provides feedback and reviews

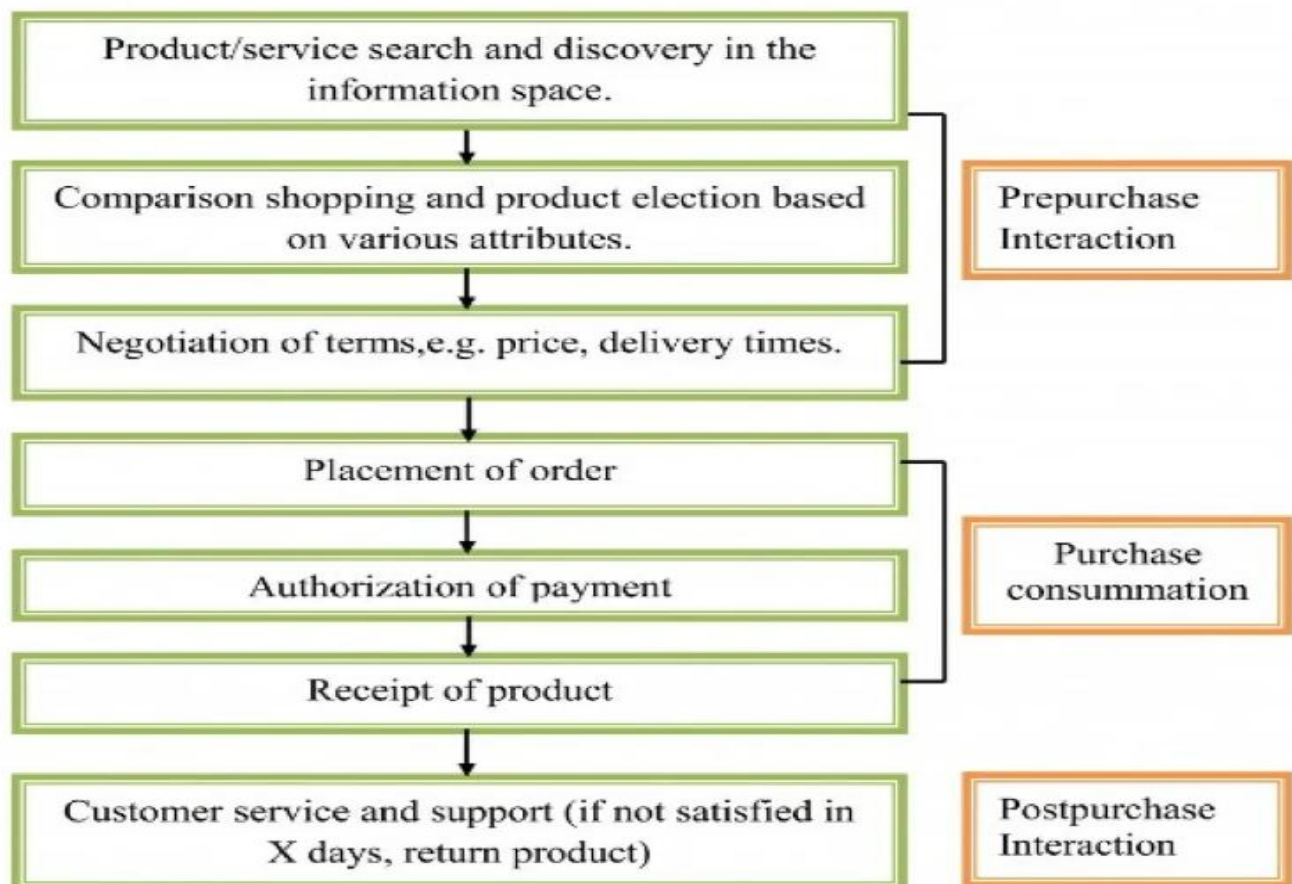
Example - Buying a Mobile Phone Online:

Pre-Purchase: User visits Daraz, searches 'Samsung mobile', compares models and prices.

Purchase: User selects the phone, adds to cart, enters shipping address, pays via Khalti.

Post-Purchase: Phone delivered in 3 days, user tests it, and writes a positive review.

Diagram - Mercantile Process Model Flow:



Q9. What are the advantages and disadvantages of e-commerce? [8 marks]

Advantages vs Disadvantages of E-commerce:

Advantages of E-commerce	Disadvantages of E-commerce
Global reach - accessible worldwide 24/7.	Requires internet access, unavailable in remote areas.
Lower operational cost (no physical store needed).	High initial setup cost for website and infrastructure.
Convenient - shop anytime from anywhere.	Customers cannot touch or feel products before buying.
Wide product variety and easy comparison.	Delivery time may be long compared to physical stores.
Personalized shopping through data analytics.	Privacy concerns - customer data can be misused.
Faster transactions and quick delivery services.	Risk of fraud, hacking, and cybercrime.
Reduces geographical barriers for businesses.	Technical issues like server downtime affect sales.
Automated inventory and customer management.	Return and refund process is complicated.
Eco-friendly - reduces paper and physical resources.	Lack of personal customer service and human interaction.
Enables small businesses to compete with big brands.	Requires digital literacy - not user-friendly for all.

Q10. Explain broadband technologies used in e-commerce. How chatting on the web helps in e-commerce? [4+4] [8 marks]

Broadband Technologies in E-commerce:

Broadband refers to high-speed internet connections that allow fast transmission of large amounts of data. It plays a vital role in e-commerce by enabling smooth online transactions, streaming, and communication.

1. DSL (Digital Subscriber Line): Uses existing telephone lines to deliver high-speed internet. Affordable and widely available.

2. Cable Broadband: Uses cable TV network to provide internet. Offers higher speeds than DSL.

3. Fiber Optic (FTTH): Uses light signals through glass fibers. Provides ultra-fast and reliable internet, ideal for e-commerce servers.

4. Satellite Broadband: Uses satellites to provide internet in remote areas where cables are not available.

5. Wireless Broadband (Wi-Fi, 4G/5G): Provides mobile internet access. Enables mobile e-commerce (m-commerce).

6. WiMAX: Provides long-range wireless broadband for cities and rural areas.

How Chatting on the Web Helps in E-commerce:

- **Instant Customer Support:** Live chat allows customers to get their queries resolved immediately.
- **Increases Sales:** Real-time interaction helps convince customers to complete purchases.
- **Personalized Assistance:** Chat agents can recommend products based on user needs.
- **Reduces Cart Abandonment:** Helps clarify doubts about products, payments, or delivery instantly.
- **Feedback Collection:** Chats provide direct feedback and customer opinions.
- **Chatbots and Automation:** AI chatbots provide 24/7 support without human agents, saving cost.
- **Better Customer Trust:** Quick response builds confidence in the brand.
- **Multi-language Support:** Chatting tools can serve customers in different languages.

Q11. Write short notes on: [4+4] [8 marks]

a) Security Issues Related to Wireless Communication:

Wireless communication transmits data through air using radio waves, which makes it vulnerable to various security threats due to lack of physical medium.

Major Security Issues:

Eavesdropping: Unauthorized users can intercept wireless signals and read sensitive data.

Unauthorized Access: Hackers can gain access to unsecured wireless networks and steal data.

Denial of Service (DoS) Attack: Attackers flood the network with traffic to make it unavailable to users.

Man-in-the-Middle Attack: Attacker secretly intercepts and alters communication between two parties.

Spoofing: Attacker impersonates a legitimate user or device to gain access.

Weak Encryption: Use of weak protocols like WEP makes data easily decryptable.

Rogue Access Points: Fake Wi-Fi access points set up to trap users and steal information.

Malware Injection: Viruses and malware spread through unsecured wireless connections.

b) Internet Security:

Internet Security is the branch of computer security that deals with protecting internet-connected systems, including hardware, software, and data, from cyber threats and unauthorized access.

Key Components of Internet Security:

Firewall: Monitors and controls incoming and outgoing network traffic based on rules.

Antivirus Software: Detects and removes viruses, worms, trojans, and malware.

Encryption: Converts data into unreadable form to prevent unauthorized access (SSL/TLS).

Digital Signature: Verifies the authenticity and integrity of electronic documents.

Authentication: Confirms user identity through passwords, biometrics, or OTP.

Secure Protocols: HTTPS, SSL, and TLS ensure secure data transmission over the internet.

VPN (Virtual Private Network): Creates secure connection over public networks.

Intrusion Detection System (IDS): Detects and alerts about suspicious network activities.

Regular/Back Exam-2079/2080, Chaitra/Baishakh

Program: Diploma in Computer Engineering;

Q1. What is e-Business? List out the advantages and risk associated in developing e-commerce. [2 + 4 + 4 = 10 Marks]

1. What is e-Business? (2 Marks)

e-Business (Electronic Business) means using the internet and digital technology to run all internal and external operations of a company—like buying/selling, managing staff, supply chain, and customer service.

2. Advantages of Developing E-Commerce (4 Marks)

1. **Global Reach 24/7:** Allows selling products worldwide round-the-clock without physical store limits.
2. **Saves Rent & Costs:** Eliminates expensive physical showroom rents, paper forms, and large sales staff.
3. **Automated Order Processing:** Real-time order tracking, fast inventory updates, and instant invoice generation.
4. **Targeted Marketing:** Uses customer search history to show personalized product offers.

3. Risks Associated with E-Commerce (4 Marks)

1. **Cyber Security Attacks:** Risk of credit card fraud, malware infections, and database hacking.
2. **Technical Dependency:** Server crashes or internet outages instantly halt sales.
3. **Lack of Physical Touch:** Customers cannot feel or try products before buying, leading to returns.
4. **Data Privacy Liabilities:** Non-compliance with data privacy laws leads to legal trouble.

Q2. What is e-Procurement? Explain B2C and C2C ecommerce with an example.

1. What is e-Procurement? (2 Marks)

e-Procurement means buying raw materials, office supplies, and business equipment online between companies using automated software and digital orders.

B2C E-Commerce (Business-to-Consumer)

: **B2C E-Commerce** refers to a business model where a registered commercial company sells products or services directly to individual end-consumers for personal use over the internet.

- **Key Characteristics:**

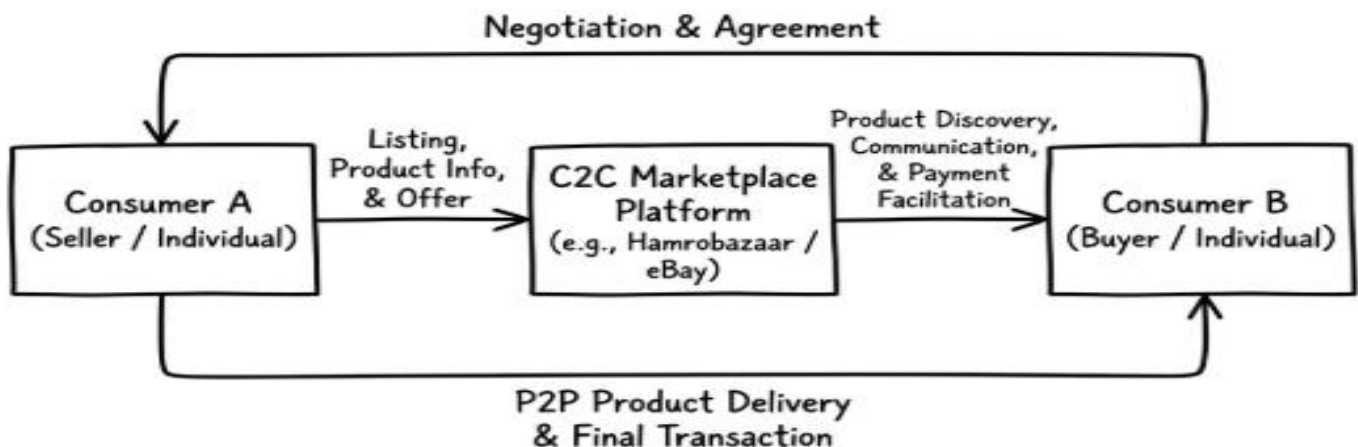
- **Retail Pricing:** Fixed catalog prices listed publicly on web storefronts or mobile apps.
- **Order Volume:** Small order quantities (e.g., buying 1 phone or 1 pair of shoes).
- **Fast Decision Making:** Customers make quick impulse buying decisions.
- **Payment Methods:** Uses digital wallets (eSewa/Khalti), payment cards, or Cash on Delivery (COD).

Real-World Example: Buying a laptop, clothes, or groceries online from **Daraz** or **Amazon**.



C2C E-Commerce (Consumer-to-Consumer) (4 Marks)

- Definition: C2C E-Commerce refers to a business model where an online platform enables private individual consumers to trade, sell, or buy second-hand goods and services directly with each other.
- Key Characteristics:
 - Person-to-Person Trading: Transactions take place directly between two private individuals.
 - Role of Platform: The platform (e.g., Hamrobazaar) acts purely as an intermediary connecting buyers and sellers.
 - Flexible Pricing: Prices are usually negotiated directly or decided through online bidding/auctions.
- Real-World Example: Selling a used mobile phone or motor-bike directly to another person on Hamrobazaar or eBay.



Q3. Define software agent. What are the types of software agent? Explain the requirements of I-way. [2 + 4 + 4 = 10 Marks]

1. Definition of Software Agent (2 Marks)

A Software Agent is a smart computer program that works automatically in the background to complete routine tasks for users without needing continuous clicking.

2. Types of Software Agents (4 Marks)

1. **Shopping Bots (Buyer Agents):** Automatically compares prices across different online stores to find the best deal.
2. **Personal Agents:** Learns user habits to auto-sort emails, set reminders, and auto-fill checkout forms.
3. **Monitoring Agents:** Keeps an eye on server health and alerts admins if a website crashes or gets hacked.
4. **Recommendation Agents:** Analyzes user browsing history to suggest related products.

3. Requirements of Information Superhighway (I-Way) (4 Marks)

- **High Speed Internet:** Fast fiber-optic (FTTH) and 5G networks to transport heavy video and transaction data.
- **Standard Rules (Protocols):** Open standards (like TCP/IP) so all smartphones and laptops connect easily.
- **Cyber Security:** SSL/TLS encryption and firewalls to keep online payments safe.
- **Last-Mile Access:** Easy Wi-Fi and mobile network connections for everyday users.

Q4. What is EDI and explain how it works? Write down the benefits of EDI. [5 + 5 = 10 Marks]

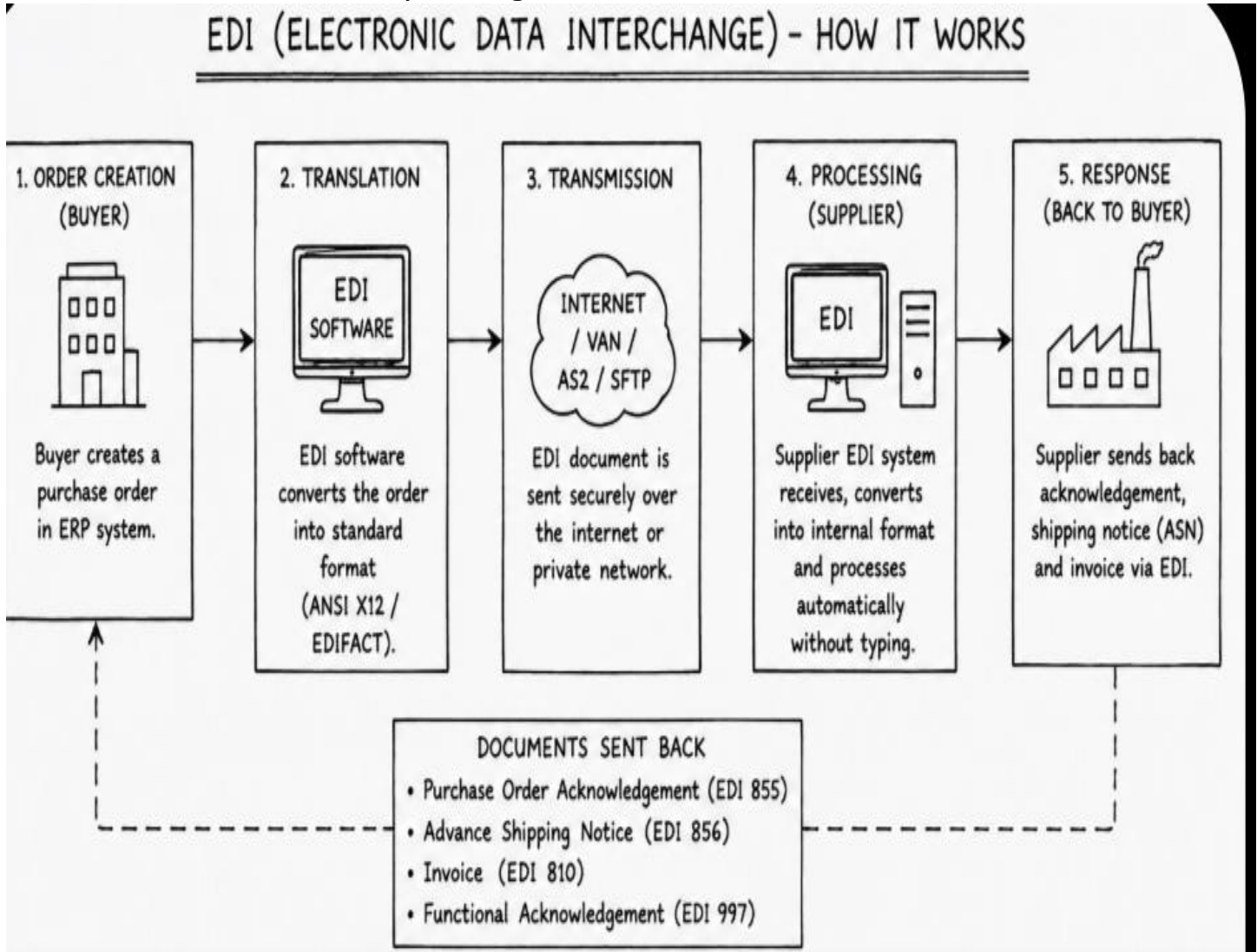
1. What is EDI & How It Works? (5 Marks)

EDI (Electronic Data Interchange) is the automatic computer-to-computer sharing of standard business documents (like purchase orders and invoices) between two companies without paper or manual typing.

b) How EDI Works (5 Marks)

1. **Order Creation:** The buyer creates a purchase order in their ERP or accounting system.
2. **Translation:** EDI software converts the purchase order into a standard EDI format (e.g., ANSI X12 or EDIFACT).

3. **Transmission:** The EDI document is sent securely through the Internet, AS2, SFTP, or a Value Added Network (VAN).
4. **Processing:** The supplier's EDI system receives the document, converts it into its internal format, and processes it automatically.
5. **Response:** The supplier sends acknowledgements, shipping notices, and invoices electronically through EDI.



2. Benefits of EDI (5 Marks)

1. **Saves Paper Costs:** Eliminates paper printing, postage, and manual filing expenses.
2. **Prevents Typing Errors:** Computer sends data directly, avoiding human mistakes.
3. **Super Fast Speed:** Documents reach in seconds instead of days.
4. **Better Supply Chain Tracking:** Real-time tracking of orders and stock levels.

Q5. What are the applications of m-commerce? Explain the m-commerce architecture. [5 + 5 = 10 Marks]

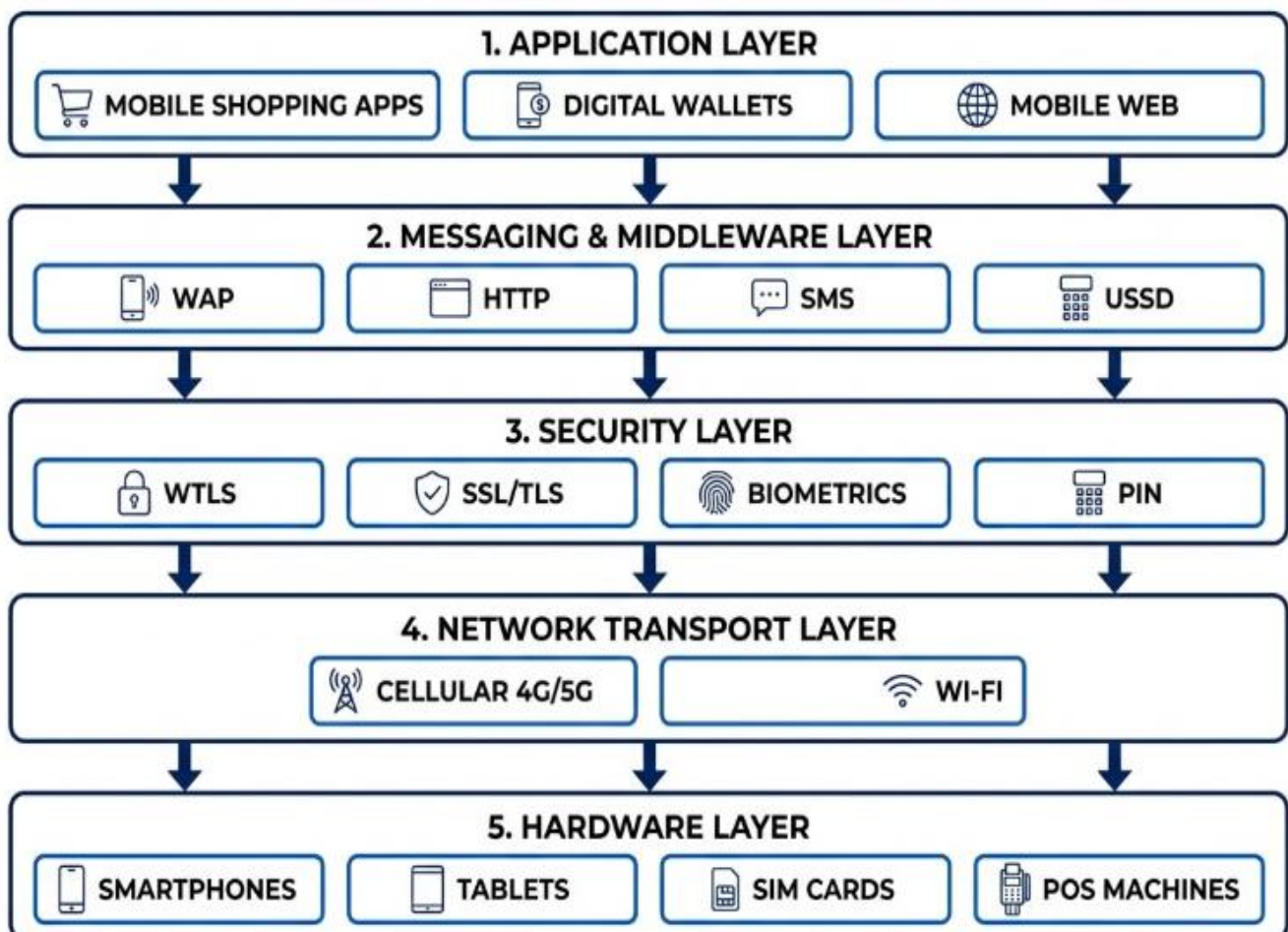
1. Applications of M-Commerce (5 Marks)

1. **Mobile Banking & Wallets:** Scanning merchant QR codes, loading mobile balance, and paying bills via **eSewa, Khalti, ConnectIPS**.
2. **App Shopping:** Purchasing products directly on dedicated shopping apps like **Daraz**.
3. **Ride-Hailing & Delivery:** Booking rides on **Pathao / InDrive** or ordering food using mobile GPS.
4. **Mobile Ticketing:** Booking flight, bus, and movie tickets directly on mobile phones..

M-Commerce Architecture (5 Marks)

The M-Commerce architecture is structured into **5 core layers** that work together to process mobile transactions securely:

**M-COMMERCE ARCHITECTURE
(MOBILE COMMERCE LAYERED ARCHITECTURE)**



Explanation of Layers:

1. Application Layer (Top Layer):

- Represents the user interface where consumers interact with mobile shopping apps, mobile web browsers, and digital payment wallets.

2. Messaging & Middleware Layer:

- Protocols that handle communication and translate data formatting between mobile devices and central web servers (e.g., **WAP, HTTP, SMS, USSD**).

3. Security Layer:

- Encrypts sensitive financial data transmitted over airwaves using protocols like **WTLS** and **SSL/TLS**, along with user authentication via **Fingerprint/Face ID** and **PINs**.

4. Network Transport Layer:

- Cellular and wireless broadband infrastructure that carries data packets across long distances (e.g., **4G LTE, 5G, Wi-Fi**).

5. Hardware Layer (Bottom Layer):

- The client-side physical hardware devices used by buyers to execute transactions (e.g., **Smartphones, Tablets, SIM Cards, POS machines**).

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- Hackers intercept unencrypted financial data (like credit card numbers and passwords) as it travels across public Wi-Fi or networks.

2. **Phishing & Spoofing:**

- **Phishing:** Fake emails or text messages sent to trick users into entering login credentials on fraudulent sites.

3. **Denial of Service (DoS / DDoS) Attacks:**

- Cybercriminals flood an e-commerce web server with massive fake traffic using botnets,.

4. **Data Tampering / Alteration:**

- Unauthorized modification of order details, shipping addresses,

5. **Identity Theft & Payment Fraud:**

- Attackers steal a user's personal identity or payment card details to make illegal purchases online without authorization.

Q7. Describe about the online banking facilities of Nepali banks. What are the characteristics of successful entrepreneur? [5 + 5 = 10 Marks]

Online banking (Internet & Mobile Banking) provided by commercial and development banks in Nepal allows customers to perform secure financial transactions electronically from their smartphones or computers 24/7 without physically visiting a bank branch.

Online Banking Facilities of Nepali Banks (5 Marks)

1. **Inter-Bank Transfer:** Instant 24/7 money transfers between bank accounts via **ConnectIPS** or mobile banking apps.
2. **Utility Bill Clearing:** Paying electricity (NEA), water, internet, and TV bills online.
3. **QR Code Payments:** Scanning **Fonepay / NepalQR** codes at local shops and restaurants.
4. **Government Services:** Paying vehicle tax, passport fees, and revenue tax online.

2. Characteristics of a Successful Entrepreneur (5 Marks)

1. **Risk-Taking:** Willingness to invest money and effort into unproven business ideas.
2. **Creativity:** Ability to invent new products or solve everyday customer problems.
3. **Resilience:** Never giving up even after facing business setbacks or losses.
4. **Leadership:** Guiding and inspiring a team toward clear long-term goals.
5. **Adaptability:** Quickly changing business strategies to match market trends.

Q8. Explain briefly about online marketing. Write the differences between online marketing and offline marketing. [5 + 5 = 10 Marks]

Answer:

1. Explain Online Marketing (5 Marks)

Online Marketing (Digital Marketing) means advertising and promoting products, services, and brands online using social media (FB, Insta), Google Ads, SEO, and email to attract customers..

- **Key Channels:**

- Social Media Marketing (SMM): Running ads on Facebook, Instagram, and TikTok.
- Search Engine Optimization (SEO/PPC): Google search ads and ranking products on search results.
- Email Marketing: Sending promotional offers and newsletters directly to customer inboxes.

2. Difference Between Online and Offline Marketing (5 Marks)

Basis	Online Marketing	Offline Marketing
Definition	Marketing done via internet & digital channels.	Marketing done via traditional physical media.
Key Media	Facebook, Instagram, Google Ads, Email.	TV, Newspapers, Radio, Billboards, Pamphlets.
Audience Reach	Global Reach—targets customers 24/7 anywhere.	Local Reach—restricted to a specific local area.
Cost	Highly cost-effective; flexible for low budgets.	Very expensive (high printing and TV costs).
Tracking	Real-Time Analytics (Tracks exact clicks & sales).	Hard to Track (Can't count billboard viewers).
Interaction	Two-Way (Customers can like, comment, & chat).	One-Way (Audiences passively read or watch).

Q9. Write short notes on (Attempt Any TWO) [2 × 5 = 10 Marks]

- **i) Cyber Law**

Legal rules governing internet activities to protect users from i) Cyber Law is the legal framework that governs the internet, digital communications, electronic commerce, and computer networks to maintain digital safety and prevent online crimes.

- **Key Provisions & Objectives:**
 - **Legal Recognition:** Gives legal validity to electronic signatures and digital contracts (e.g., **Electronic Transaction Act / ETA 2063 in Nepal**).
 - **Crime Prevention:** Punishes cybercriminals for offenses like hacking, identity theft, website defacement, and online payment fraud.
 - **Consumer Protection:** Protects online buyers from fraudulent e-commerce portals and unauthorized data leaks.
-
- **ii) Digital Wallet (eSewa)**
 - **Definition:** A digital wallet is a secure mobile application or electronic account that stores digital money to allow instant, cashless transactions over the internet.
 - **Features of eSewa in Nepal:**
 - **Pioneer Wallet:** Licensed and regulated by Nepal Rastra Bank as a digital payment service provider.
 - **Everyday Services:** Used to scan Fonepay/NepalQR codes at shops, pay utility bills (electricity, water, internet), top-up mobile airtime, and buy flight or movie tickets.
 - **Security:** Secured using PIN codes, passwords, and biometric authentication (Fingerprint / Face ID).
-
- **iii) Issues Related to E-Commerce**
 - **Definition:** Challenges and risks faced by online businesses and customers that affect digital sales and consumer trust.
 - **Key Issues:**
 - **Cyber Security Threats:** Threat of credit card theft, phishing scams, and database hacking.
 - **Lack of Physical Inspection:** Buyers cannot touch or test products before buying, leading to quality mismatches and product returns.
 - **Delivery & Logistics:** Shipping delays, damaged goods during transit, or high delivery charges in remote regions.
 - **Technical Outages:** Website crashes or payment gateway downtimes halting online sales.
-
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• iv) Difference between Internet, Intranet, and Extranet.

Comparison Basis	Internet	Intranet	Extranet
Accessibility	Public: Accessible to anyone in the world with an internet connection.	Private: Restricted strictly to internal company employees.	Semi-Private: Restricted to employees and authorized external partners (vendors, dealers).
User Base	Unlimited global public users.	Company staff and employees only.	Selected B2B clients, suppliers, and distributors.
Security & Firewalls	Low public security; protected via SSL/TLS certificates.	High security; protected by internal company firewalls.	High security; protected using VPN (Virtual Private Network) and firewalls.
Ownership	Not owned by any single entity or company.	Owned and managed by a single organization.	Owned and managed jointly by collaborating companies.
Primary Purpose	Sharing general information, e-commerce, communication, and public browsing.	Internal collaboration, HR management, company communication, and file sharing.	Supply chain management, B2B communication, ordering, and inventory tracking.
Network Size	Unlimited global network.	Small to medium (within one organization).	Medium to large (organization + business partners).
Real Example	Google, YouTube, Wikipedia, Daraz.com.np	Employee portal, Company HR system, Internal email portal	Supplier portal, Dealer portal, Alibaba vendor portal

Q1. Define E-commerce. Explain the application of E-commerce. [2 + 6 = 8 Marks]

1. Definition of E-Commerce (2 Marks):

E-Commerce (Electronic Commerce) is the buying, selling, and exchanging of goods, services, and money electronically over the internet using computers, smartphones, and web networks.

2. Applications of E-Commerce (6 Marks):

- **Online Shopping & Retail:** Purchasing clothes, electronics, and groceries directly from web stores or apps (e.g., **Daraz, Amazon**).
- **Digital Banking & Financial Services:** Performing money transfers, utility bill clearing, and account management (e.g., **ConnectIPS, eSewa**).
- **Online Ticketing & Reservations:** Booking airline tickets, bus seats, hotel rooms, and movie tickets online.
- **Supply Chain & E-Procurement:** Computer-to-computer ordering of raw materials and wholesale inventory between companies.
- **E-Learning & Digital Education:** Buying online courses, books, and educational materials (**Udemy, Coursera**).
- **Digital Entertainment:** Purchasing digital subscriptions for games, streaming movies, and music (**Netflix, Spotify**).

Q2. Explain Traditional marketing. How does it differ from modern E-commerce marketing? [2 + 6 = 8 Marks]

Traditional marketing refers to conventional, non-digital methods of promoting and advertising products or services through physical, offline channels. It relies on mass broadcast and print media to deliver promotional messages to potential consumers within a specific geographical area.

2. Key Features (4 Features)

1. **Offline Channels:** Operates via physical media like newspapers, television, radio, pamphlets, and outdoor billboards.
2. **One-Way Communication:** Information flows strictly from the business to the customer with no direct, instant feedback loop.
3. **Mass Audience Focus:** Broadcasts advertisements to a broad demographic crowd simultaneously without personalized user filtering.
4. **Tangible Materials:** Involves physical promotional items such as printed flyers, catalogs, brochures, and business cards.

3. Advantages & Disadvantages

• Advantages:

- **High Local Trust:** Highly effective and widely trusted by local communities and non-tech-savvy audiences.
- **Tangible Impact:** Physical print materials leave a memorable, long-lasting physical impression on customers.

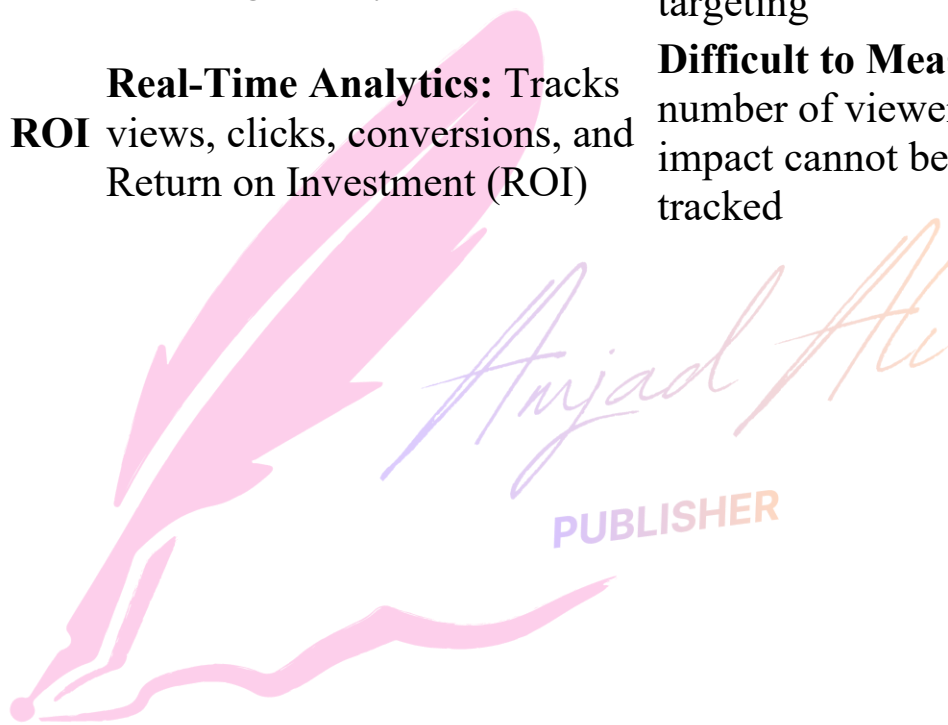
• Disadvantages:

- **High Advertising Cost:** Television slots, print media space, and billboard rentals are very expensive.
- **Hard to Track ROI:** Impossible to accurately count how many people viewed a billboard or made a purchase from a newspaper ad

• Online Marketing vs Offline (Traditional) Marketing (6 Marks)

Parameter	Online Marketing	Offline (Traditional) Marketing
Primary Mediums	Social media (Facebook, Instagram, TikTok), Google Ads, SEO, Email Marketing	Newspapers, Magazines, TV Commercials, Radio, Billboards
Audience Reach	Global Reach: Targets customers worldwide 24/7	Local/Regional Reach: Limited to a specific city or geographical area

Parameter	Online Marketing	Offline (Traditional) Marketing
Marketing Cost	Cost-Effective: Flexible budget, suitable for small and large businesses	High Cost: TV ads, newspapers, and billboards are expensive
Communication Flow	Two-Way Communication: Customers can like, comment, share, message, and chat	One-Way Communication: Customers only watch or read advertisements
Targeting Precision	Highly Targeted: Based on age, location, interests, and browsing history	Mass Targeting: Advertisements are shown to a broad audience without precise targeting
Tracking & ROI	Real-Time Analytics: Tracks views, clicks, conversions, and Return on Investment (ROI)	Difficult to Measure: Exact number of viewers and sales impact cannot be accurately tracked



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Q3. Write down the characteristics of Business-to-Business (B2B) E-commerce. Explain electronic marketing in it. [4 + 4 = 8 Marks]

1. Characteristics of B2B E-Commerce (4 Marks):

- **Bulk Order Volume:** Transactions involve large quantities of raw materials or wholesale products.
- **Negotiated Pricing:** Prices are customized through contracts, bulk discounts, and bidding rather than fixed catalog pricing.
- **Complex Buying Cycle:** Involves multiple decision-makers, approvals, legal contracts, and credit terms.
- **Long-Term Business Relationships:** Focuses on recurring orders and stable supplier-buyer partnerships.

Electronic Marketing in B2B E-Commerce

1. Explanation (3 Lines)

Electronic marketing in B2B (Business-to-Business) e-commerce refers to using digital networks, online portals, and electronic communication channels to market products, services, and raw materials directly to other corporate clients and procurement managers.

2. Key Features (4 Features)

1. **Targeted Corporate Reaching:** Focuses specifically on business executives, purchasing agents, and wholesalers rather than general consumers.
2. **Data-Driven Content:** Uses detailed digital catalogs, technical specification sheets, customized price quotes, and bulk volume proposals.

3. Advantages & Disadvantages

- **Advantages:**
 - **Lower Marketing & Sales Cost:** Reaches global corporate buyers efficiently without requiring expensive physical trade fairs or international sales travel.
 - **Automated Lead Nurturing:** Automated email flows and portal updates continuously guide clients through complex, multi-stage B2B purchasing decisions.
- **Disadvantages:**
 - **Longer Decision Cycles:** Marketing efforts take much longer to convert leads because multiple corporate stakeholders must approve purchases.
 - **High Security & Trust Barrier:** Corporate buyers require proven business reputation, strict data privacy, and secure communication channels before placing large bulk orders.

Q4. Why security issue is important in E-commerce? Explain the types of electronic payment in E-commerce. [3 + 5 = 8 Marks]

1. Importance of Security in E-Commerce (3 Marks):

Security is critical in e-commerce because online platforms process financial data (credit card numbers, bank credentials) and sensitive personal information over public networks. Without security:

- Customers risk money loss and identity theft due to phishing and hacking.
- E-commerce businesses suffer reputational damage, financial loss, and legal penalties.

2. Types of Electronic Payment Systems (5 Marks):

1. Payment Cards (Debit & Credit Cards):

- **Debit Cards:** Deduct money instantly from the customer's linked bank account.
- **Credit Cards:** Borrow funds up to a pre-approved credit limit (**Visa, MasterCard**).

2. Digital Wallets (E-Wallets):

- Mobile apps that store pre-loaded money to scan QR codes and pay online (**eSewa, Khalti**).

3. Net Banking & Direct Transfers:

- Direct online portals connecting bank accounts for inter-bank money clearing (**ConnectIPS**).

4. Electronic Cheques (E-Cheques):

- Digital versions of paper cheques signed using secure digital signatures for clearing.

5. Cryptocurrency / Digital Currency:

- Decentralized digital money utilizing blockchain technology (**Bitcoin, Ethereum**).

Q5. What are the technologies used in mobile commerce? Explain the architecture of Wireless Application Protocol (WAP). [3 + 5 = 8 Marks]

1. Technologies Used in Mobile Commerce (3 Marks):

- **Cellular Broadband Networks:** High-speed **4G LTE and 5G** networks for data transmission.
- **Wireless Application Protocol (WAP):** Standard protocol allowing mobile web browsers to access sites.
- **Location-Based Services (GPS):** Enables real-time tracking for ride-hailing and food delivery apps (**Pathao**).
- **Near Field Communication (NFC) & QR Codes:** Allows contactless point-of-sale scanning (**Fonepay**).

3. Architecture of WAP (5 Marks):



Application Layer (WAE): Renders lightweight web pages formatted in **WML** (Wireless Markup Language).

- **Session Layer (WSP):** Manages continuous sessions between the mobile client and the gateway.
- **Transaction Layer (WTP):** Ensures reliable data packet request/response handling.
- **Security Layer (WTLS):** Provides encryption and data integrity over wireless airwaves.
- **Transport Layer (WDP):** Handles raw data transport across different cellular carrier networks.

Q6. Explain the use of web-based client/server and selling on the web in e-commerce. [4 + 4 = 8 Marks]

Web-based client/server architecture in e-commerce enables smooth interaction between users (clients) and online platforms (servers), while selling on the web refers to leveraging these systems to market, transact, and deliver products/services online.

Web-Based Client/Server in E-Commerce

- **Client/Server Model:**

- **Client (User Side):** Web browser or mobile app where customers browse products, add to cart, and initiate transactions.
- **Server (Business Side):** Hosts business logic, product databases, payment gateways, and order management systems.

- **Advantages:**

- Centralized control of data and security.
- Efficient communication between multiple users and servers.
- Scalability to handle thousands of concurrent transactions.

- **Challenges:**

- Server downtime halts all client activity.
- Requires strong cybersecurity to prevent fraud and data breaches

Selling on the Web

- **Online Selling:** Refers to conducting commercial transactions through websites, marketplaces, or social platforms.

- **Key Features:**

- **Product Catalogs:** Organized listings with descriptions, images, and prices.
- **Shopping Carts & Checkout:** Streamlined purchase process.
- **Payment Integration:** Secure gateways (PayPal, Stripe, eSewa in Nepal).
- **Order Fulfillment:** Automated inventory updates, shipping, and tracking.

- **Benefits:**

- Global reach beyond physical stores.
- 24/7 availability for customers.
- Lower operational costs compared to traditional retail.

- **Risks:**

- Competition is intense.
- Dependence on digital trust and secure payment systems.

Q7. Explain about ethical and public policy issues in e-commerce. [8 Marks]

Answer:

Ethical and public policy issues in e-commerce revolve around protecting consumer rights, ensuring fair business practices, safeguarding privacy, and regulating digital transactions to maintain trust and accountability in the online marketplace.



Ethical Issues in E-Commerce

- **Privacy Protection:** Collecting and storing customer data raises concerns about misuse, unauthorized sharing, and surveillance.
- **Security Concerns:** Ethical responsibility to protect users from fraud, hacking, and identity theft.
- **Transparency:** Businesses must disclose terms, pricing, and policies clearly to avoid misleading customers.
- **Intellectual Property:** Preventing piracy, counterfeit goods, and unauthorized use of digital content.
- **Fair Competition:** Avoiding monopolistic practices, fake reviews, and manipulative algorithms.
- **Consumer Trust:** Ethical marketing and honest product representation are critical for loyalty.



Public Policy Issues in E-Commerce

- **Regulation of Online Transactions:** Governments enforce laws on taxation, digital contracts, and consumer protection.
 - **Cybersecurity Laws:** Policies mandate secure payment systems and protection against cybercrime.
 - **Data Protection Policies:** Frameworks like GDPR ensure user consent and control over personal data.
 - **Cross-Border Trade:** Policies address customs, tariffs, and international consumer rights.
 - **Digital Divide:** Public policy aims to ensure equal access to e-commerce platforms across regions.
 - **Taxation:** Governments regulate online sales tax to ensure fair revenue collection.
-

Q8. Explain mercantile process model with example. [8 Marks]

Mercantile Process Model

The **mercantile process** is an interaction framework between **consumer** and **merchant** in online commerce. It is divided into three main phases:

1. Pre-Purchase Preparation

- Consumer searches for products/services to meet requirements.
- Activities include:
 - **Information search** (via websites, ads, reviews).
 - **Comparison of alternatives** (price, features, brand).
 - **Decision-making styles:**
 - Impulsive buyers (quick purchase).
 - Patient buyers (compare before buying).
 - Analytical buyers (research extensively).

2. Purchase Consummation

- Actual transaction takes place.
- Activities include:
 - **Product selection** (adding to cart).
 - **Payment processing** (credit cards, digital wallets, digital cash).
 - **Order confirmation** (receipt, invoice).
- **Protocols:** Secure payment gateways, encryption, authentication.

3. Post-Purchase Interaction

- Focuses on customer service and support.
- Activities include:
 - **Delivery tracking** and fulfillment.
 - **Customer feedback** and complaint handling.
 - **After-sales services** (returns, refunds, warranties).

Example of Mercantile Process

Let's take **Amazon** as an example:

1. **Pre-Purchase:** A customer searches for a smartphone, compares brands, reads reviews.
2. **Purchase:** Adds the phone to cart, pays via credit card or eSewa (in Nepal), receives confirmation email.
3. **Post-Purchase:** Tracks delivery, receives product, and may contact customer support for warranty or return.

Q9. Define E-commerce law. Why is it necessary? Explain taxation and encryption policies. [2 + 3 + 3 = 8 Marks]

- **E-Commerce Law:** A set of rules and regulations governing online trade, digital contracts, electronic payments, intellectual property, and consumer rights.
- It ensures that online transactions are legally valid, enforceable, and secure.

 Why E-Commerce Law is Necessary

- **Consumer Protection:** Safeguards buyers from fraud, misleading ads, and unfair practices.
- **Legal Validity:** Ensures electronic contracts and digital signatures are recognized by law.
- **Trust Building:** Encourages customers to adopt online shopping confidently.
- **Tax Compliance:** Helps governments collect fair revenue from online trade.
- **Cybersecurity:** Protects sensitive data and prevents hacking or identity theft.

 Taxation Policies in E-Commerce

- **Taxation in E-Commerce:** Governments impose taxes on online sales to ensure fair competition with traditional businesses.
- **Key Points:**
 - **Sales Tax / VAT:** Applied to goods and services sold online.
 - **Cross-Border Transactions:** Customs duties and tariffs apply to imports/exports.
 - **Digital Goods:** Special rules for software, e-books, and streaming services.
 - **Challenges:** Identifying jurisdiction, tax evasion, and compliance across multiple countries.

 Encryption Policies in E-Commerce

- **Encryption in E-Commerce:** Encryption secures sensitive information (credit card numbers, passwords, personal data) during transmission.
- **Key Points:**
 - **SSL/TLS Protocols:** Secure communication between client and server.
 - **Public Key Infrastructure (PKI):** Digital certificates authenticate merchants and customers.
 - **Data Privacy Laws:** Require businesses to encrypt stored and transmitted data.
 - **Benefits:** Prevents fraud, builds consumer trust, and ensures compliance with cybersecurity regulations

10. What is consumer-oriented application? Explain customer relationship management (CRM). [2 + 6 = 8 Marks]

Consumer-Oriented Applications

- **Online Shopping Portals:** Websites and apps where customers browse, compare, and purchase products.
- **Electronic Payment Systems:** Secure gateways like PayPal, eSewa, or mobile banking for transactions.
- **Customer Support Services:** Chatbots, FAQs, and helpdesks to resolve queries.
- **Personalization Tools:** Recommendation engines that suggest products based on browsing history.
- **Loyalty Programs:** Reward points, discounts, and membership benefits to retain customers.



Customer Relationship Management (CRM)

- **Definition:** CRM is a strategy and software system used by businesses to manage customer interactions, track preferences, and improve satisfaction.
- **Functions:**
 - **Data Collection:** Storing customer purchase history, feedback, and preferences.
 - **Communication:** Personalized emails, offers, and notifications.
 - **Retention:** Loyalty programs, after-sales support, and targeted promotions.
 - **Analysis:** Using analytics to predict customer needs and improve services.
- **Benefits:**
 - Builds long-term trust and loyalty.
 - Increases repeat purchases.
 - Helps businesses adapt to customer behavior.

Q11. Write short notes on: [4 + 4 = 8 Marks]**a) Importance of E-Commerce**

- **Global Reach:** Businesses can access customers worldwide without physical boundaries.
- **24/7 Availability:** Online stores operate round-the-clock, increasing convenience for consumers.
- **Cost Efficiency:** Reduces expenses on physical infrastructure and marketing.
- **Personalization:** Recommendation systems tailor products to customer preferences.
- **Faster Transactions:** Digital payments and automated order processing save time.
- **Business Growth:** Enables SMEs and startups to compete with larger firms.

b) Wireless Application Protocol (WAP)

- **Definition:** WAP is a standard protocol that allows mobile devices to access internet services, including e-commerce applications.
- **Features:**
 - Provides a lightweight browser for mobile phones.
 - Uses **WML (Wireless Markup Language)** optimized for small screens.
 - Supports secure transactions over wireless networks.
- **Applications:**
 - Mobile banking and payments.
 - Online shopping via mobile phones.
 - Accessing email and information services.
- **Advantages:**
 - Extends e-commerce to mobile users.
 - Increases accessibility in regions with limited computer use.
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