**SET 4**

Group 'A' (Long questions)

Attempt any TWO questions   2x10=20

1. **What is Security Standard? Explain EGovernment Security Architecture with proper diagram.**

    Security standards are guidelines and best practices established to ensure the confidentiality, integrity, and availability of information, systems, and processes within an organization. These standards help organizations protect their assets from various threats, including cyber-attacks, unauthorized access, and data breaches.

    E-GOVERNMENT SECURITY ARCHITECTURE

    The security architecture of E-governance is a high-level document that set the security goals of e-governance project and describe the procedure that need to be followed by all the e-governance hierarchy such as users, businesses, operators etc.
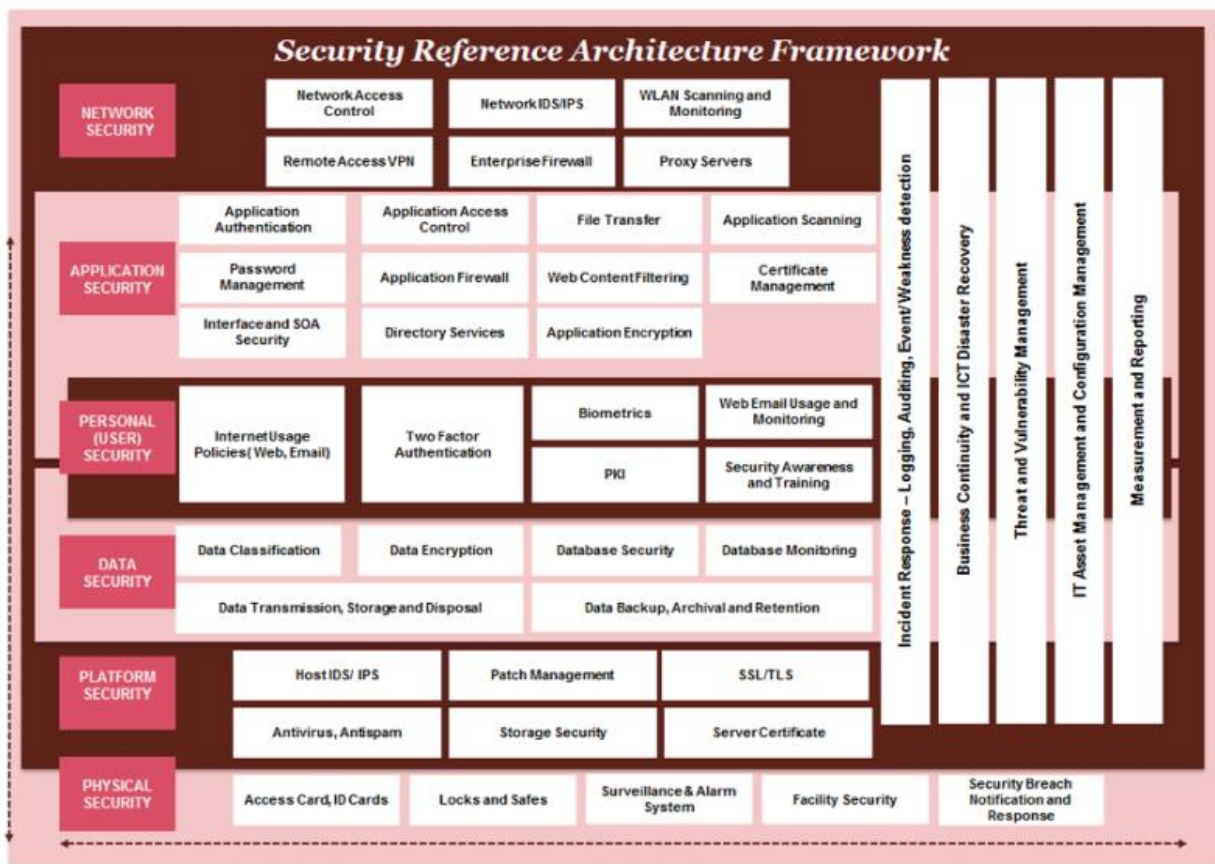
    Security Layers Description

    Network Security: (authentication, firewall protection, network intrusion detections,)

Application Security: use of software, hardware, and procedural methods to protect applications from external threats.

Personnel/User Security: various authentication mechanisms for verification of user identify such as two-factor authentication, biometrics

Data Security: deals with security mechanism adopted for keeping data protected from corruption and unauthorized access to ensure data privacy

Platform /Host Security: Platform security deals with the security mechanisms adopted on servers, workstations and operating systems.

Physical Security: Physical security refers to the security characteristics concerned with restricting physical access by unauthorized personnel

Cross Pillars

Incident Response: to address and manage any security breach or attack.

Business Continuity and ICT Disaster Recovery: ensure that essential business functions and ICT operations can continue during and after a disaster.

Threat and Vulnerability Management: to identify risks and mitigation control in the ICT environment.

ICT Asset Management: to manage ICT assets throughout their lifecycle.

**Measurement and Reporting:** provides information on the health check of the ICT appliances and Systems.

2. **Compare and contrast between comparative analysis model and interactive service model.**
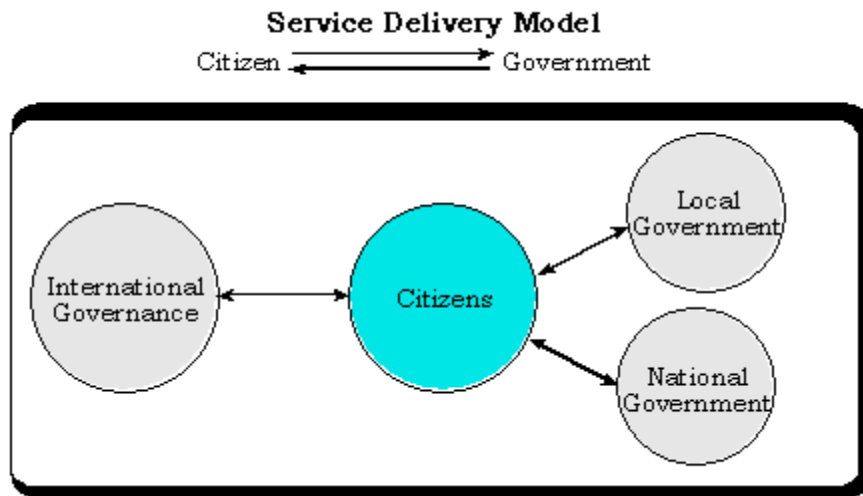   **Comparative analysis model**
   Principle
   The model aims to empower individuals by comparing instances of poor governance with those of effective governance. It seeks to identify specific aspects of inadequacies in governance, understand the underlying reasons and individuals responsible, and propose strategies for improvement. Leveraging the extensive capabilities of Information and Communication Technology (ICT) and social media tools, the model delves into provided information sets, comparing them with comparable data available in the public or private domain.

Comparative Analysis Model
Private/Public Domain + Public/Private Domain
——► Wider Public Domain
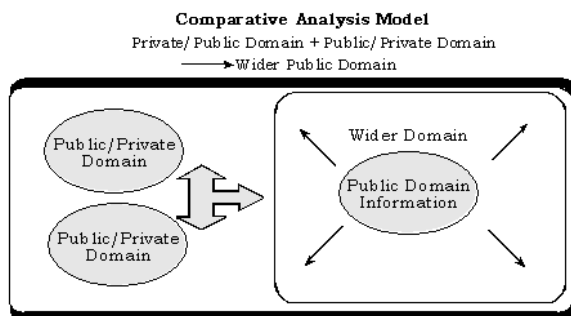
Interactive-Service Model/ Government-To-Citizen-To-Government Model
This is two-ways or multiple-ways communities' model Interactive-Service model is the action or process of making something stronger or more solid. This model establishes communication between government to citizen or consumers and citizens to government. For example, if the government built the web application about the income tax, public use that website to pay their tax and they will get the receipt. This established the relation between government to citizen to government.

Service Delivery Model

Citizen ⟷ Government

International Governance ⟷ Citizens

Local Government

National Government

Key Differences:

- **Nature**: Comparative Analysis model involves comparing different aspects or performances of various entities within the government or across different governments whereas Interactive Service model emphasizes direct interaction and engagement between citizens and government agencies through digital platforms or channels.
- **Focus**: Comparative Analysis Model focuses on evaluating and comparing data or practices, while the Interactive Service Model emphasizes providing interactive and personalized services to citizens.
- **Methodology**: Comparative Analysis involves data collection, analysis, and reporting, whereas Interactive Service Model involves the development and deployment of digital platforms for citizen-government interaction.
- **Application**: Comparative Analysis model is commonly used in assessing the effectiveness of government programs, policies, or services by comparing them with similar initiatives in other regions or countries while Interactive service models are commonly employed in areas such as online tax filing, e-procurement, citizen service centers, online education, healthcare portals, and e-voting systems.
- **Outcome**: Comparative Analysis Model aims to inform policy decisions and improve governance practices, while Interactive Service Model aims to enhance citizen satisfaction, efficiency, and accessibility of government services.

3. **What is E governance? Explain all phases of E-Government Life Cycle with proper diagram.**

E-Governance

E-governance is a development, deployment, and enforcement of the policies, laws, and regulations necessary for developing cooperation, networking and partnerships between government units, citizens and the business.

E GOVERNMENT LIFE CYCLE

E-Government development projects typically consist of five stages; project assessment, analysis of current reality, design of the new system, system construction, and implementation and beyond.
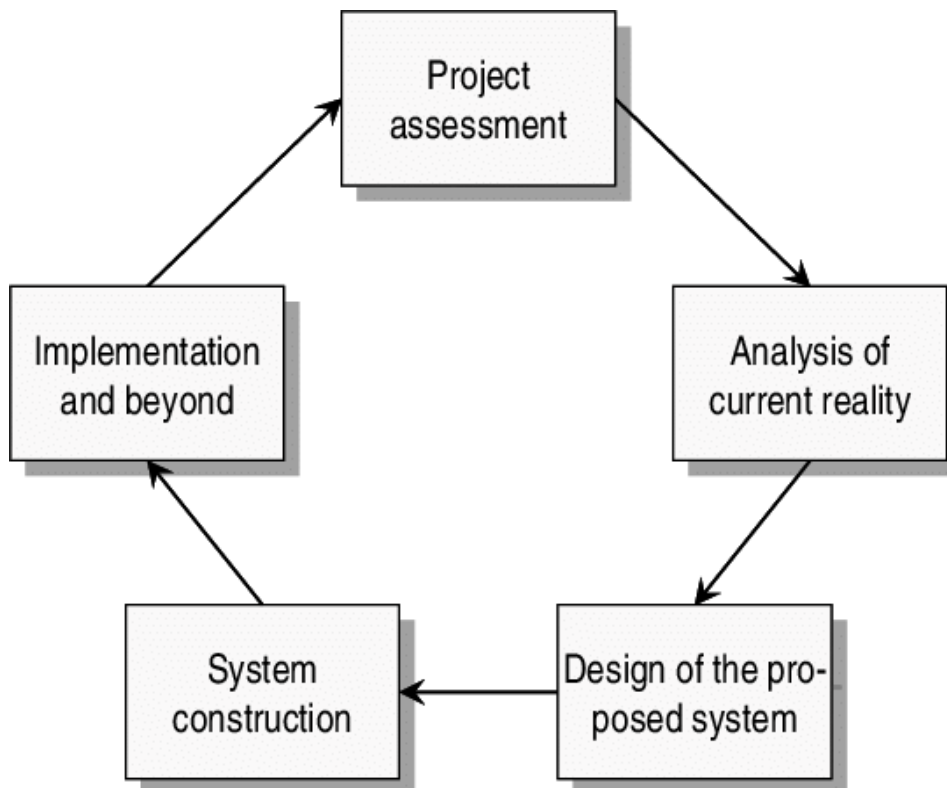
Project Assessment

Project assessment, in the development model is the identification is possible e-governance projects.

Needs Assessment: Identify the needs and requirements of citizens, business and government agencies that can be addressed through e-government.

Strategic Planning: Define the goals, objectives, and overall strategy for the e-government initiative. Align the project with the broader goals of the government.

Analysis of current reality:

Another important part of the project is analysis of current reality.

Process Analysis: Examine existing government processes and identify areas that can be digitized or improved through technology.

System Design: Develop a detailed plan for the e-government system, including the architecture, functionalities, and user interfaces.

Design stage:

The design stage of the proposed new situation consists of setting objectives related to the above-mentioned dimensions of the new system – putting together the different objectives for the new system to meet. In this stage issues of software and hardware need to be dealt with. Work processes are also necessary to take into account from a design perspective, and not just the front-end processes, but also the underlying processes.

System construction:

System construction consists of the process and activities in acquiring any new IT, undertaking detailed design of the new e-government system (for example a system installation), building it, testing it, and documenting it.

Implementation and Beyond

Implementation and beyond is represented by the planning of implementation processes, for example: training users to use the new information system, converting data from old to new formats; systems maintenance activities; introducing the new e-government system; monitoring and evaluating its performance and context; and undertaking necessary activities.

Group 'B' (Short Questions)

Attempt all the questions 8x5=40

1. **Explain the need of e governance with context to reference of Nepal.**

   In the context of Nepal, there are several reasons why e-governance is needed.

   i. Improving Access to Services

   Nepal is a geographically diverse country with many remote and rural areas. E-governance can help bridge the gap citizens and government services by proving online platforms for accessing services such as healthcare, education and public utilities. This is particularly important for citizens living in hard-to-reach areas who may face challenges in accessing traditional government offices.

   ii. Enhancing Efficiency
   Traditional paper -based government processes can be time consuming and prone to errors. E-governance systems streamline administrative processes, reduce paperwork and increase the speed of service delivery.

   iii. Promoting Transparency and Accountability
   e-governance platforms can promote transparency by making government information more accessible to citizens. For e.g.: publishing government budgets, expenditures and project updates online can help citizens hold officials accountable for their actions.

iv. Implememtation and Beyond
At this stage end user interact with the system. Main focus at this stage is focus on system maintenance and clear responsibilities. We get the output of the system and kind of result which is useful to upgrade the system and analysis user demands as well as requirements.

2. **Compare and contrast between comparative analysis model and interactive service model**.
Comparative analysis model
It is one of the least used but high potential e-governance model for developing countries. The model can be used to empower people by comparing cases of bad governance with those of good governance and how the situation can be improved. This model is based on using huge capacity of ICT and social media tools to explore given information sets with comparable information available in the public or private domain. The strength of this model lies in the infinite capacity of digital networks to store mixed information and retrieve and transmit it instantly across all geographical and hierarchical barriers.

3. **Define data mining and data warehouse. How can you use these concept in e governance?**
Data Mining: Data mining is the process of discovering patterns, trends, correlations, and valuable insights from large datasets using various techniques, including statistical analysis, machine learning, and artificial intelligence.
Data Warehousing: Definition: Data warehousing involves the collection, storage, and management of data from various sources in a centralized repository called a data warehouse.

Applications of Data Mining in e-Governance in the Context of Nepal:

i. Data mining can help identify fraudulent activities and transactions in various government processes, such as tax collection, public procurement, and social welfare programs.
ii. Data mining can assist in optimizing resource allocation by analyzing historical data and patterns to identify areas where resources are most needed and where they can be best utilized.
iii. By analyzing data from various government departments and agencies, data mining can aid in policy formulation, decision-making processes, and evidence-based governance.
iv. Data mining can be used to analyze citizen behavior, preferences, and feedback, which can help in improving public services and tailoring governance initiatives to meet citizens' needs.
v. Data mining can be applied to predict demand for public services, such as healthcare, education, and transportation, allowing government agencies to better plan and allocate resources accordingly.

4. **Write short note on National Reservoir Level and Capacity Monitoring System.**

National Reservoir Level and Capacity Monitoring System
Reservoir is an area developed by water body due to construction of dam. Reservoir serve: Irrigation, Water supply, Hydroelectricity power generation, Flood control, Navigation, Soil conservation, etc. the level in the reservoir is used to start and stop pumps in the automatic made

of control. The reservoir level signal is compared with high and low level setpoints, which indicate when the pump is to be started and stopped.

"Reservoir level and Storage Capacity Monitoring" is a network-centric application and has a significant importance in evaluation of water utilization, crop production and estimation, hydropower generation, of states/national level under uniform protocol of communication among state and Centre. The parameter could be an early warning indicator to the crop production and hydro power generation of the country. Any significant deviation from the norms could attract attention of the planners and administrators.

5. **What are the various Challenges and Approach of E-government Security?**

CHALLENGES AND APPROACHES OF E-GOVERNMENT SECURITY

E-government, or electronic government, refers to the use of information and communication technologies (ICTs) to enhance the efficiency, effectiveness, and transparency of government services and processes. Ensuring the security of e-government systems is crucial to safeguarding sensitive information, maintaining public trust, and preventing cyber threats.

Challenges:

- **Cybersecurity Threats:** E-government systems face a wide range of cyber threats, including malware, phishing attacks, ransomware, and distributed denial-of-service (DDoS) attacks. These threats can disrupt services, steal sensitive data, or compromise the integrity of government systems.
- **Data Privacy:** E-government platforms often handle large amounts of personal and sensitive information. Ensuring the privacy and confidentiality of this data is essential to protect citizens' rights and prevent identity theft or unauthorized access.
- **Complexity of Systems:** E-government initiatives typically involve complex systems and interconnected networks, making them vulnerable to security vulnerabilities and misconfigurations. Managing security across these diverse systems can be challenging, especially when integrating legacy systems with newer technologies.
- **Insider Threats:** Insider threats, whether intentional or accidental, pose a significant risk to e-government security. Employees or contractors with privileged access to government systems may abuse their privileges, leak sensitive information, or inadvertently introduce security vulnerabilities.
- **Compliance and Regulations:** E-government initiatives must comply with various regulations and standards related to data protection, privacy, and cybersecurity. Ensuring compliance with these requirements adds complexity to security management and may require substantial resources.

Approaches:

- **Risk Assessment and Management:** Conducting regular risk assessments helps identify potential security threats and vulnerabilities within e-government systems. By prioritizing risks and implementing appropriate controls, government agencies can mitigate security risks effectively.
- **Security by Design:** Implementing security measures from the design phase of e-government projects helps build robust security foundations. This includes incorporating security features such as encryption, access controls, and authentication mechanisms into system architecture and development processes.

- **Access Control and Authentication:** Implementing strong access control measures, such as role-based access control (RBAC) and multi-factor authentication (MFA), helps prevent unauthorized access to government systems and sensitive data.
- **Continuous Monitoring and Incident Response:** Adopting continuous monitoring tools and practices allows government agencies to detect security incidents promptly and respond effectively. Establishing incident response plans and conducting regular security drills help ensure a rapid and coordinated response to cyber threats.
- **Education and Training:** Providing cybersecurity awareness training to government employees and contractors helps raise awareness about security best practices and reduces the risk of insider threats. Training programs should cover topics such as phishing awareness, secure password management, and data handling procedures.

6. **Explain E-Government Architecture with proper diagram.**

   The architecture model emphasizes the importance of user engagement, efficiency through streamlined processes, collaboration, and the use of technology standards for data sharing and service delivery.
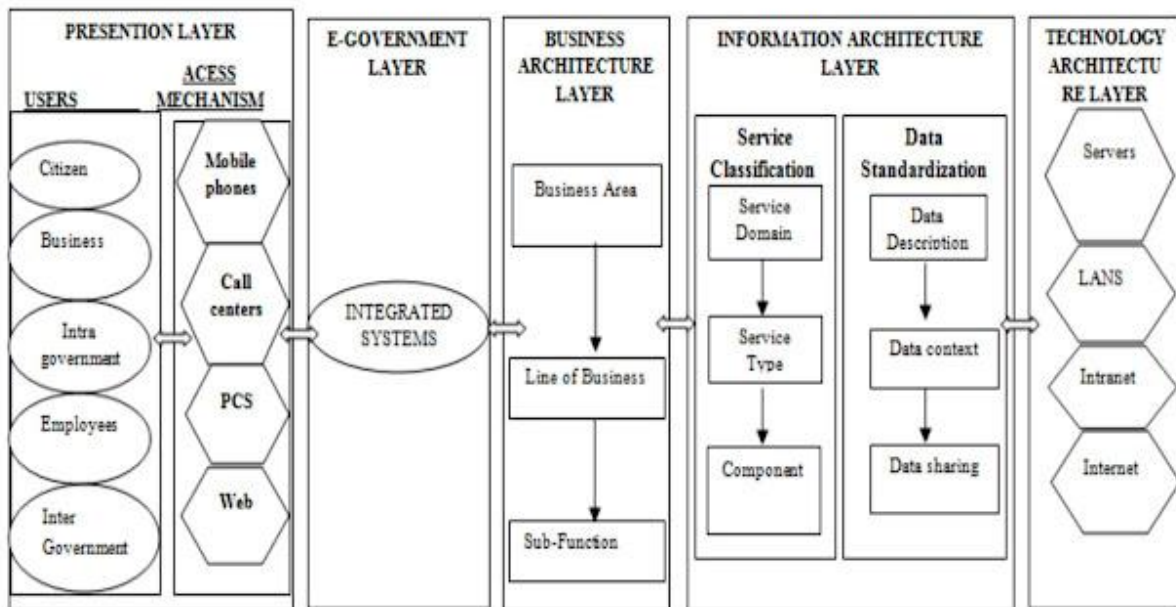

Figure 4 Overall E-government architecture structure With its functions

Presentation layer: The presentation layer is the user interface through which citizens and businesses interact with e-government services. It includes web interfaces, mobile apps, and other user-facing components designed to provide intuitive and user-friendly access to government information and services.

E-Government Layer: the main goal of e-government layer is to achieve a government that;

- Does not ask for information it already has.
- Is focused on better services
- Will not allow its facilities to be misused
- Is well informed

Business Architecture Layer: it provides a functional rather than organizational view of the governments line of business including its internal operations services for citizens. It describes government around common business, thus promotes agency collaboration.

Information Architecture Layer: The information architecture layer in e-government architecture focuses on the organization, structure, and management of information assets within digital government systems. It encompasses the design and implementation of data models, databases, metadata, and other components that govern how information is captured, stored, processed, and accessed.

Technology Architecture Layer: In e-government architecture, the technological architecture layer focuses on the specific technologies and infrastructure components that support the implementation and operation of digital government services.

This layer encompasses the hardware, software, networking, and communication technologies utilized to build and maintain e-government systems.

7. **Write short notes on Implementation in the Land Reform.**
   Land Reform is a program especially undertaken by a national government, involving the redistribution of agricultural land among the landless. Its is the reform of the regulatory and administrative frameworks, including laws, regulations, and rules for better management of land ownership. Nepal has been attempting to reform rural land relations for more than 50 years.

   Following are the issues facing equitable land ownership in Nepal today:
   - The real picture if land ownership is not known.
   - The rule of land law has been seriously undermined.
   - Divisions of positions of positions and rising doubt.
   - Faith in the capacity of the state as land reformer is law.

8. **What are the various Characteristics of Maturity Levels?**
   The maturity model for e-governance can vary, but here are generalized characteristics for different maturity levels:
   - **Level 1: Closed:**
     - Limited use of technology in governance processes.
     - Paper-based or manual processes dominate.
     - Minimal automation; reliance on traditional methods.
     - Lack of integration between different government departments.
     - Limited citizen access to online services.

- **Level 2: Initial:**
  - Basic online presence with informational websites.
  - Introduction of some electronic services, but not fully integrated.
  - Limited interdepartmental coordination and data sharing.
  - Initiatives are project-driven rather than part of a cohesive strategy.
  - Citizens may access some services online, but not comprehensively.
- **Level 3: Planned:**
  - Improved integration of electronic services across departments.
  - Increased interdepartmental data sharing and coordination.
  - Implementation of basic data analytics for decision-making.
  - Enhanced citizen interaction through online platforms.
  - Focus on improving user experience and service delivery.
- **Level 4: Realized:**
  - Advanced data analytics and predictive modeling for decision support.
  - Comprehensive integration of electronic services across government entities.
  - Increased automation and efficiency in governance processes.
  - Enhanced cybersecurity measures to protect citizen data.
  - Greater emphasis on citizen engagement and feedback.
- **Level 5: Optimized:**
  - Continuous improvement and innovation in e-governance processes.
  - Full adoption of emerging technologies (e.g., AI, blockchain).
  - Seamless and personalized citizen experiences.
  - Proactive in anticipating and addressing citizen needs.
  - Strong focus on open data, transparency, and accountability.