CA - Intermediate

Paper 7A - Enterprise Information System

(2nd Edition)

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PREFACE

To get the good score in EIS, 2 things are very important. First is to understand the concept and second is to present the same in the exam. This book takes care of both the aspects.

Following features of the book makes it unique study guide for EIS:

- Aligned as per ICAI Module.
- Covers revised syllabus of ICAI.
- Simple & lucid language.
- Question-Answer format as per ICAI expectations.
- More than 200 MCQs as per revised exam pattern.
- Use of SmartArt for Memory Aid.
- Topics have been profusely illustrated with diagrams and examples to make the concept more practical and simple.

Digital version of this book is freely available at www.caintereis.blogspot.in. Paper-book is available at www.notionpress.com. We will highly appreciate the feedback and suggestions for further improvement of the book. Contact us at career@infosec-career.com.

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CA.Hemang Doshi

I would like to express my gratitude to:

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Chapter 1 Automated Business Processing

This chapter deals with various provisions and aspects of automated business processes and covers the following important topics:

- Business Process Automation
- Enterprise Risk Management
- Risk & Internal Control Systems
- Flowcharts
- Dataflow Diagrams
- Regulatory & Compliance Requirements
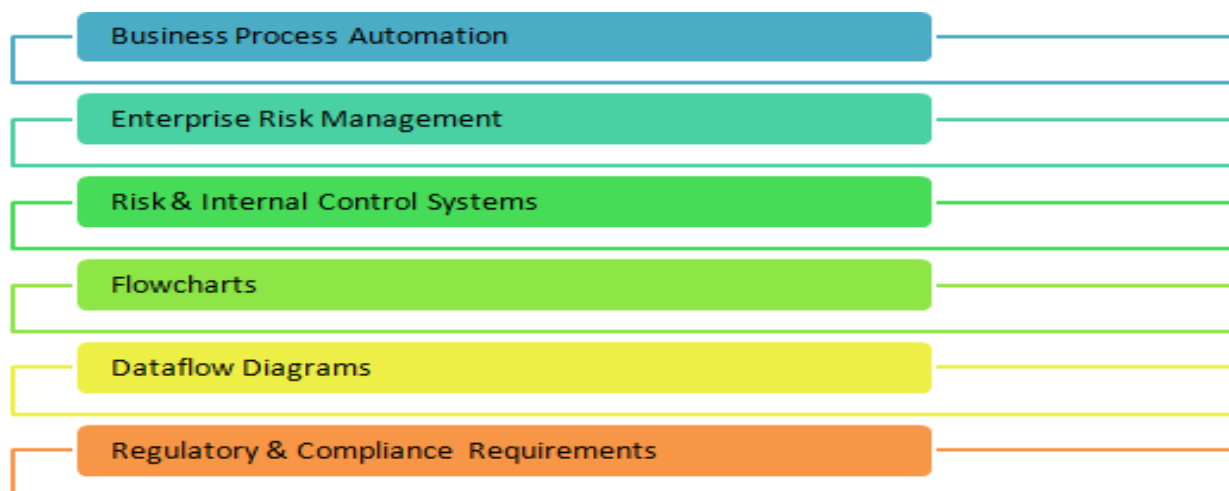
Business Process Automation

(1)What are the different categories of Business Process?

Answer: Three different categories of business process are as follow:

Operational Process	Supporting Process	Management Process
It is also known as Primary Process.	It is also known as secondary process.	-
Process is directly connected with core business and value chain.	Process is not directly connected with core business but support the primary process.	Process to measure, monitor and control primary as well as secondary processes.
Provides directs value to the customer.	Do not provide direct value to the customer. However, it impacts the efficiency of the organisation.	Do not provide direct value to the customer. However, it impacts the efficiency of the organisation.
Directly involved in generating revenues.	Not directly involved in generating revenues.	Not directly involved in generating revenues.
Example: Procurement Process (Purchase to Pay cycle), Sales (Order to Cash cycle)	Example: Accounting Process, HR Process etc.	Example: Budgeting, Planning, Governance etc.

(2) What are the objectives of Business Process Automation? / Recognize the parameters based on which success of business process automation (BPA) can be evaluated?

Answer: The success of any business process automation shall only be achieved when BPA ensures the following:
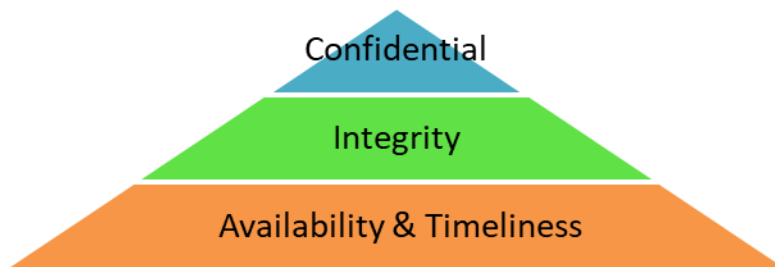
(1)Confidentiality: To ensure confidentiality of data. Only authorized person can access the data.

(2)Integrity: To ensure integrity (i.e. correctness) of the data. No unauthorized changes can be done.

(3)Availability: To ensure availability of data when asked for.

(4)Timeliness: To ensure data is available at right time.

(3)What are the benefits of automating business processes? (May 19)

Answer: Following are the benefits of automating business processes:
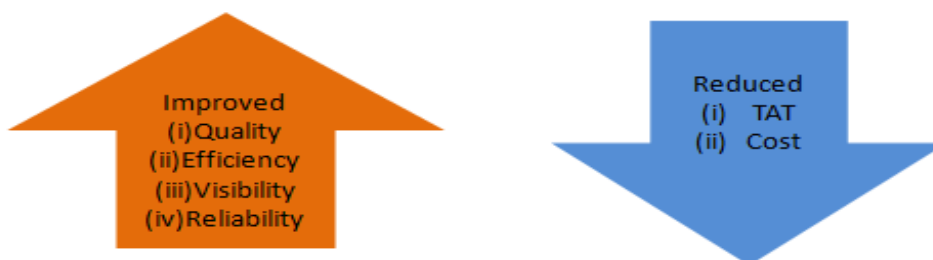
(1)Improved Quality & Consistency:
- Automation ensures high quality process with consistent results.

(2)Improved Operational Efficiency:
- Automation ensures smooth & efficient system performance and also reduces error margin.

(3)Improved Visibility:
- Automation improves visibility of the organization. With efficient processes, value of the organization improves.

(4)Improved Reliability:
- With automated processes in place, stakeholders can rely on the organization. This gives a competitive advantage to the organization.

(5)Reduced TAT:
- Automation eliminates unnecessary tasks and improves operational performance and reduces the turnaround times for processes.

(6)Reduced Cost:

- Automation ensures optimum utilization of resources and hence costs associated with processes are reduced. Comparatively, manual task is performed at a slower rate and more costly.

"Yesterday there was a homeless person here. I told you automation can replace anybody."

(4)What are the steps of implementation of Business Process Automation?

Answer: Following are the steps involved in implementing business process automation:

Steps	Details
Step 1: Justify the Requirement for BPA (i.e. why BPA?)	• First step is any automation process is to justify the requirement of automation. • Automation may be required to reduce errors or improving TAT or streaming the process or to improve customer service or combination of all.
Step 2: Understand various regulations applicable to the organisation. (i.e. Which regulations?)	• Organisation need to ensure that BPA adheres to the requirement of all application laws and regulations.
Step 3: Document the current process.	• In third step, it is required to document current process (which is to be automated). • Documentation provides clarity on the process and helps to focus on desired result with automation.
Step 4: Define goals of BPA.	• In fourth step, organisation needs to determine key objectives and goals. • Goals should be SMART in the sense that it should be specific, measurable, achievable, realistic and time-bound.
Step 5: Appoint an expert i.e. business process consultant	• Expert consultant for automation to be engaged after due consideration. • Capability, expertise and experience of consultant to be evaluated before engagement.
Step 6: Calculate ROI for the project.	• ROI to be calculated and communicated to senior management for approval of automation. • All the stakeholders to be engaged and involved to ensure that all benefits are clearly captured.
Step 7: Implementation of BPA.	• Once the above steps are completed, expert consultant designs

	and develops the BPA.
Step 8: Testing of BPA.	• Before launching of BPA, it needs to be thoroughly tested.

Enterprise Risk Management

(5)What is Enterprise Risk Management?

Enterprise Risk Management (ERM) is defined as a process:
- effected by Senior Management of the organization
- applicable across enterprise
- designed to identify potential events and manage risk within its risk appetite
- that provide reasonable assurance regarding the achievement of entity's objectives.

(6)What are benefits of Enterprise Risk Management?

Answer: Following are the benefits of Enterprise Risk Management:

Improved Allignment & Linkagae

Improved Decision Making & Opportunity Managment

Improved Capital Allocation & Reduction in losses

Management of Cross functional Risks & Multiple risks
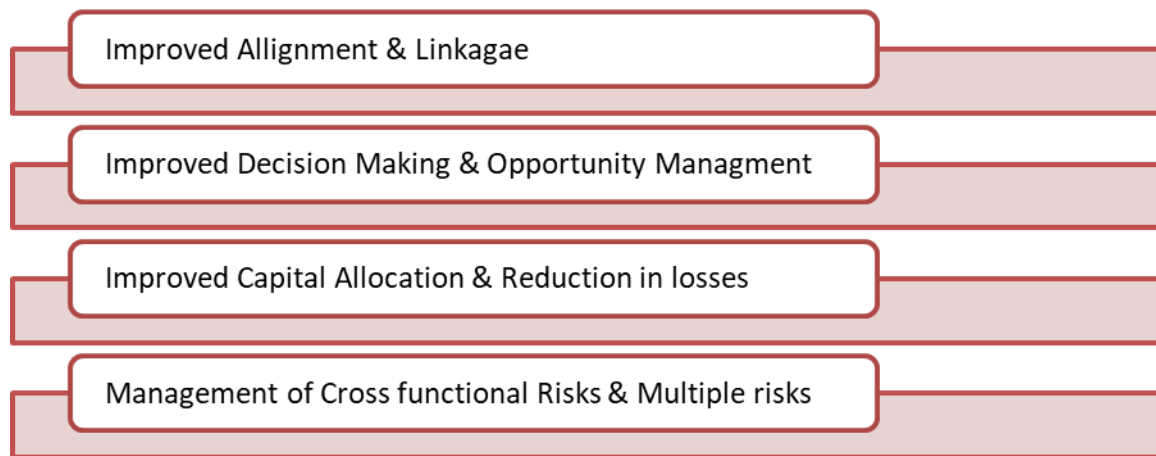
(1)Improved alignment of Risk Appetite & Strategy:
- Risk appetite is the maximum risk that an entity is ready to accept to achieve its objectives.
- ERM improves alignment of risk appetite and business strategy.

(2)Improved linkage between growth, risk and return:
- ERM provides platform to establish linkage between growth, risk and return.

(3)Improved Decision Making:
- ERM provides platform to evaluate various risk responses (i.e. avoid/reduction/share/accept) and take appropriate action.

(4)Improved Opportunity Management:
- ERM provides the platform to identify potential event to grab the opportunities for better performance.

(5)Improved Capital Allocation:
- ERM helps in optimum capital allocation by providing information on entity's total risk.

(6)Reduce Operational losses:
- ERM provides capability to identify potential events and take appropriate action to minimize the operational losses.

(7)Management of cross-enterprise risks:
- ERM provides opportunity to manage cross-enterprise risks.

(8)Management of multiple risks:
- ERM helps to manage multiple risks with single solution.

(7)What are components of Enterprise Risk Management?

Answer: ERM consists of following 8 components that are interrelated:

Step 1	Step 2	Step 3	Step 4
•Set the Environment	•Set the Objective	•Identify the Event	•Risk Assessment •Risk Response •Control Activities •Information & Communication
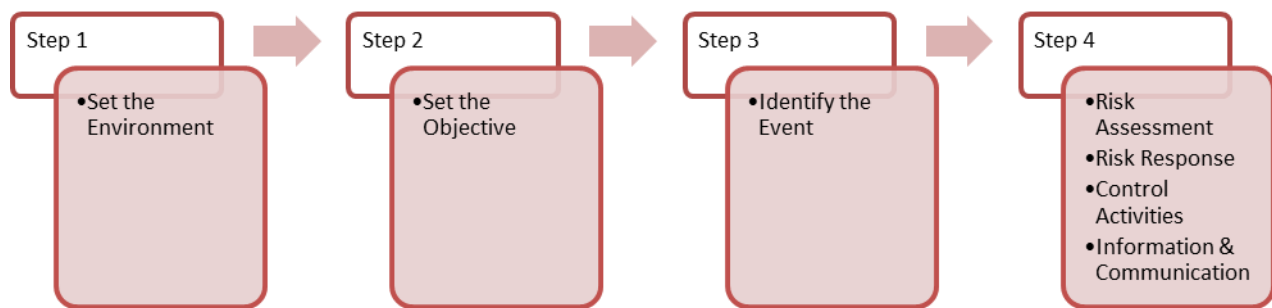
(1)Internal Environment:
- This component reflects an entity's enterprise risk management philosophy and commitment.
- The internal environment sets the foundation for how risks and controls are viewed and addressed by entity's people.

(2)Objective Setting:
- ERM ensures that management has a process for setting objectives.
- Objective setting is a pre-condition to event identification, risk assessment and risk response.

(3)Event Identification:
- This component reflects identification of potential events that have impact on entity.
- Potentially negative events represent risks whereas potentially positive events represent opportunities.

(4)Risk Assessment:
- The likelihood and impact of risks are assessed.
- Risks are assessed on both inherent as well as residual basis.

(5)Risk Response:
- Management considers alternative risk response options.
- Risk response can be in form of avoiding, accepting, reducing or sharing of risk.

(6)Control Activities:
- Management implements control activities like policies and procedures throughout the organization for managing risk.

(7)Information & Communication:
- The organization communicates relevant information in a timely manner.
- Effective communication flows down, across and up the organization.

(8)Monitoring:
- ERM system should be monitored and modified, if required.

Risks

(8)Define Risk?

Answer:
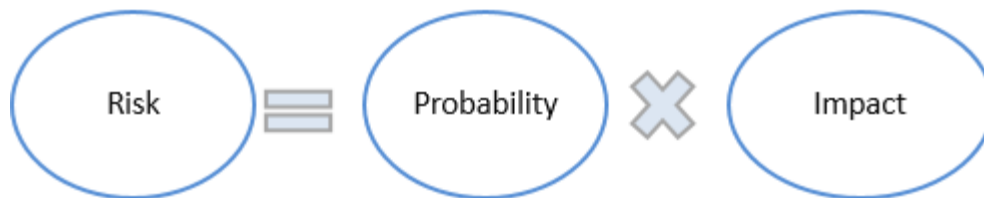
- Risk is defined as an event that may have impact on the business objective.
- Degree of risk is determined on the basis of probability of the occurrence and severity of the impact.
- In simplest form, Risk is the product of Probability & Impact i.e. Risk= P * I

(9)What are the Risks of Business Process Automation?

Answer: Following are some of the risks associated with business process automation:

(1)Inaccurate Input:
- Risk of inaccurate or incomplete input data.

(2)Inaccurate Transmission:
- Risk of inaccurate transmission due to network error.

(3)Inaccurate Processing:
- Risk of inaccurate processing due to program error or bug.

(4)Inaccurate Output:
- Risk of inaccurate output due to error or bugs.
- Also, there is risk of unauthorised access to output file due to weak access control.

(5)Unauthorized Data Access:
- Risk of unauthorised modification of master data due to weak access control.

(6)Inappropriate Infrastructure:
- Risk of data loss in absence of proper back-up arrangement.

(10)What are the types of Business Risks?

Answer: Types of Risk faced by the business units are as follow:

(1)Strategic Risk: Risk that prevents organisation to achieve its strategic objectives.

(2)Financial Risk: Risk that have impact of financial losses i.e. loss of assets.

(3)Operational Risk: Risk that disrupts the efficient and effective operations of the organisation.

(4)Regulatory/Compliance Risk: Risk that amount to non-compliance with laws and regulation and results into fines and penalties.

(5)Reputational Risk: Risk that have impact of negative publicity of the organisation.

Internal Control Systems

(11)Define Internal Control System?

Answer:
- Internal Control System means all policies and procedure put in place by management to ensure that objective of the organisation is achieved.
- Internal Control System aims to ensure adherence to management policies, efficient conduct of business, safeguarding of assets, prevention and detection of fraud and error and accurate accounting and financial records.

(12)What are the components of Internal Control ?

Answer: The five components of Internal Control (as per SA 315) are as follow:

(1)Control Environment:
- The control environment includes set of standards, processes and structures for effective internal control across the organization.

(2)Control Activities:
- Control activities are the actions established through policies and procedures for the achievement of management objectives.
- Control activities include authorizations and approvals, verifications, reconciliations and business performance reviews.
- Segregation of duties (SOD) is a control activity intended to reduce opportunities for error or fraud.
- General control includes controls over IT Infrastructure, IT Management and other IT processes.

- Application controls are designed to ensure completeness, accuracy and validity of transaction processing.

(3)Control Monitoring:
- Ongoing evaluation or separate evaluation is used to ensure that components of internal controls are present and functioning.
- Ongoing evaluations help to capture timely information. Scope & frequency of Separate evaluations depends on assessment of risks, effectiveness of ongoing evaluations, and other management considerations.

(4)Risk Assessment:
- Risk assessment involves a dynamic and iterative process for identifying and assessing risks.
- Risk assessment forms the basis for determining how risks will be managed.
- Risk assessment also requires management to consider the impact of possible changes (internal as well as external) that may render internal control ineffective.

(5)Information & Communication:
- Communication is iterative process of sharing of necessary information.
- The organization communicates relevant information in a timely manner that enables people to carry out their responsibilities.
- Effective communication flows down, across and up the organization.

(13) What are the limitations of Internal Control Systems?

Answer: Internal control systems are subject to certain inherent limitations which are listed below:

(1)Cost of Internal Control: Absence of relevant data to ensure that cost of control do not exceed cost of expected benefit.

(2)Human Error: Chances of human errors such as mistakes, negligence, carelessness and misunderstanding.

(3)Unusual transactions: Internal controls do not tend to address unusual transactions.

(4)Collusion: Collusion within employees or other parties can override internal controls.

(5)Abuse of Responsibility: Abuse of responsibility by staff responsible for exercising an internal control.

(6)Manipulation by Management: The possibility of overriding of internal control by management to manipulate financial statements.

(14)Discuss risks and relevant control objectives for Procure to Pay (P2P) process?

Answer: Procure to Pay (P2P) is the process of obtaining and managing the raw materials needed for manufacturing a product or providing a service.

Following are the risks and control objectives for Procure to Pay:

Master:

Risks	Control Objectives
Unauthorized changes to supplier master file.	Only valid changes are allowed.
All valid changes are not input and processed.	All valid changes to the supplier master file should be processed.
Incorrect Changes	Changes to the supplier master file should be accurate and correct.
Delayed processing	Changes to the supplier master file should be processed in a timely manner.
Supplier master file data is not up to date.	Supplier master file data should remain up to date.
No restriction on system access	System access should be restricted to the authorized users.

Transaction:

Risks	Control Objectives
Unauthorized purchase requisitions are ordered.	Purchase orders should be placed only for approved requisitions.
Purchase Order (PO) - Incorrect Entry	Purchase orders should be accurately entered.
Purchase Order (PO) – Not processed.	All purchase orders issued should be processed.
Accounts Payable -Amounts posted in accounts payable (for goods or services) not received.	Amounts posted to accounts payable should be properly received.
Accounts Payable -Improper calculation.	Accounts payable amounts should be accurately calculated and recorded.
Accounts Payable - Amounts received are not processed.	All amounts received should be correctly processed to accounts payable.
Amounts received are recorded in the wrong period.	Amounts should be recorded in the appropriate period.
Credit Notes – Not accurately calculated and recorded.	Credit notes should be accurately calculated and recorded.
Credit Notes - Not processed.	All valid credit notes should be processed.
Credit Notes - Recorded in the wrong period.	Credit notes should be recorded in the appropriate period.

(15)Discuss risks and relevant control objectives for Order to Cash (OTC) process?

Answer: Order to Cash (OTC or O2C) is a set of business processes that involve receiving and processing customer requests for goods or services. An order to cash cycle consists of multiple sub-processes including:

(1)Customer order is documented;

(2)Order/ service is scheduled;

(3)Order is shipped to customer or service is performed;

(4)Invoice is created and sent to customer;

(5) Customer sends payment / Collection; and

(6) Payment is recorded in general ledger.

Following are the risks and control objectives for Order to Cash process:

Master:

Risks	Control Objectives
Inaccurate – Customer Master File	The customer master file should be maintained properly and accurately.
Invalid changes – Customer Master File	Only valid changes should be made to the customer master file.
Inaccurate Changes – Customer Master File	Changes to the customer master file should be accurate.
All valid changes to the customer master file are processed.	All valid changes to the customer master file should be processed.
Changes to the customer master file are not processed in a timely manner.	Changes to the customer master file should be processed in a timely manner.
Unrestricted System Access	System access to maintain customer masters should be restricted to the authorized users.

Transaction:

Risks	Control Objectives
Orders processed – Exceeding credit limits.	Orders should be processed only within approved customer credit limits.
Orders processed – Invalid & unauthorized.	Only valid & authorized orders should be input and processed.
Orders processed – Unapproved	Orders should be approved by management as to prices and terms of sale.
All orders received from customers are not processed.	All orders received from customers should be processed.
Orders and cancellations of orders are not input accurately.	Orders and cancellations of orders should be input accurately.
Invoices are generated using unauthorized terms and prices.	Invoices should be generated using authorized terms and prices.
Invoices are not accurately calculated and recorded.	Invoices should be accurately calculated and recorded.
Invoices are raised for invalid shipments.	Invoices should relate to valid shipments.
Invoices are not recorded in the system.	All invoices issued should be recorded in the system.
Invoices are recorded in the wrong period.	Invoices should be recorded for the correct period.
Unrestricted System Access	System access to process transactions should be restricted to the authorized users.

(16) Discuss risks and relevant control objectives for Inventory Cycle?

Answer:

15

The Inventory Cycle is a process of tracking the inventory levels for an enterprise. An inventory system should maintain accurate record of all stock movements to calculate the correct balance of inventory. The typical phases of the Inventory Cycle for Manufacturers are as follows:

(1)The ordering phase: The amount of time it takes to order and receive raw materials.

(2)The production phase: The amount of time it takes to convert the raw material finished goods.

(3)The finished goods and delivery phase: The finished goods that remain in stock and the delivery time to the customer.

Following are the risks and control objectives for Inventory Cycle:

Master:

Risks	Control Objectives
Invalid changes -Inventory management master file.	Only valid changes should be made to the inventory management master file.
Inaccurate Changes - inventory management master file	Changes to the inventory management master file should be accurate.
Changes are not prompt	Changes to the inventory management master file should be promptly processed.
Inventory management master file data is not up to date.	Inventory management master file data should remain up to date.
Unrestricted System Access	System access to maintain inventory masters should restricted to the authorized users.

Transaction:

Risks	Control Objectives
Raw Materials - Received without valid purchase orders.	Raw materials should be received and accepted only if they have valid purchase orders.
Raw Materials - Not recorded accurately.	Raw materials received are recorded accurately.
Raw Materials - Not recorded in system.	All raw materials received are recorded.
Raw Materials - Not recorded promptly and not in the appropriate period.	Receipts of raw materials should be recorded promptly and in the appropriate period.
Finished Goods - Returned by customers are posted in an inappropriate period.	Finished goods returned by customers should be recorded completely and accurately in the appropriate period.
Finished Goods - Received from production are not recorded.	Finished goods received from production should be recorded completely.
Shipments - Not recorded in the system.	All shipments should be recorded.
Shipments - Not recorded accurately.	Shipments should be recorded accurately.
Unrestricted System Access	System access to process inventory related transactions should be restricted to the authorized users.

(17)Discuss risks and relevant control objectives for Human Resources?

Answer: Typical stage of HR cycle includes the following:

(1)Recruiting and On-boarding:
- Recruiting is the process of hiring a new employee.
- This might include placing the job ads, selecting candidates whose resumes look promising, conducting employment interviews and other relevant actions.

(2)Orientation and Career Planning:
- Orientation is the process by which the employee becomes familiar with company processes and roles and responsibilities.
- Career planning is the stage at which the employee and her supervisors work out her long-term career goals with the company.

(3)Career Development:
- Career development includes professional growth and training to prepare the employee for more responsible positions with the company.

(4)Termination or Transition:
- In case of termination or retirement, the role of HR in this process is to manage the transition by ensuring that all policies and procedures are followed.

Following are risks and control objective for Human Resources process:

Configuration:

Risks	Control Objectives
System Access -Resigned Employees	System access to be immediately removed when employees leave the company.
System Access-In excess of job requirements	Employees should be given system access based on a "need to know" basis and to perform their job function.

Masters:

Risks	Control Objectives
New Additions - Invalid employees	Additions to the payroll master files represent valid employees.
New Additions – Not Done	All new employees should be added to the payroll master files.
Terminated employees – Not removed from payroll master files.	Terminated employees should be removed from the payroll master files.
Invalid terminations.	Deletions from the payroll master files represent valid terminations.
Invalid changes	Only valid changes are made to the payroll master files.
Inaccurate changes	Changes to the payroll master files are accurate.
Delayed changes	Changes to the payroll master files are processed in a timely manner.
Unrestricted System Access	System access to process employee master changes should be restricted to the authorized users.

(18)Discuss risks and relevant control objectives for Fixed Assets?

Answer: Fixed assets process ensures that all fixed assets are tracked and fixed asset record maintains details of location, quantity, condition, and maintenance and depreciation status

Typical steps of fixed assets process are as follows:

(1)Procuring an asset:
- An asset is entered into the accounting system when the invoice for the asset is entered.

(2)Registering or Adding an asset:
- Information entered at this stage could include; acquisition date, installation date, description, asset type, cost basis, depreciable basis etc.

(3)Adjusting the Assets:
- Adjustments with respect to improvements or repairs made to asset that either adds value to the asset or extend its economic life.

(4)Transferring the Assets:
- Asset may be sold or transferred to another entity or department within the company. This needs to be reflected accurately in the fixed assets management system.

(5)Depreciating the Assets:
- Depreciation is an expense which should be periodically accounted on a company's books, and allocated to the accounting periods, to match income and expenses.

(6)Disposing the Assets:
- Any disposals of the assets to be appropriately reported in the system.

Following are risks and control objectives for fixed Assets:

Master:

Risks	Control Objectives
Fixed Asset Register - Invalid changes	Only valid changes are made to the fixed asset register.
Fixed Asset Register - Valid changes not processed.	All valid changes to the fixed asset register should be processed.
Fixed Asset Register - Changes not accurate.	Changes to the fixed asset register should be accurate.
Fixed Asset Register - Changes not promptly processed.	Changes to the fixed asset register should be promptly processed.
Fixed asset register – Not updated.	Fixed asset register should remain up to date.
Unrestricted System Access	System access to fixed asset master file / system configuration should be restricted to the authorized users.
System configuration – Depreciation	System configuration pertaining to definition of the depreciation etc. should be correct.

Transactions:

Risks	Control Objectives
Fixed asset acquisitions - Not recorded.	All fixed asset acquisitions are recorded.
Fixed asset acquisitions - Not accurately recorded.	Fixed asset acquisitions are accurately recorded.
Fixed asset acquisitions - Not recorded in the appropriate	Fixed asset acquisitions should be recorded in the appropriate period.

period.	
Depreciation charges - Not accurately calculated and recorded.	Depreciation charges are accurately calculated and recorded.
Depreciation charges - Not recorded in the appropriate period.	All depreciation charges are recorded in the appropriate period.
Fixed asset transfer/disposal - Not recorded.	All fixed asset disposals/transfers should be recorded.
Fixed asset transfer/disposal - Not accurately recorded.	Fixed asset disposals/transfers should be accurately calculated and recorded.
Fixed asset transfer/disposal - Not recorded in the appropriate period.	Fixed asset disposals/transfers should be recorded in the appropriate period.
Unrestricted System Access	System access to process fixed asset transactions has been restricted to the authorized users.

(19)Discuss risks and relevant control objectives for General Ledger?

Answer: General Ledger (GL) process refers to the process of recording the transactions in the system.

Typical steps in general ledger process flow are as follows:

(1)Entering financial transactions into the system

(2)Reviewing Transactions

(3)Approving Transactions

(4)Posting of Transactions

(5)Generating Financial Reports

Following are some of the risk and control objectives of GL process:

Configuration:

Risks	Control Objectives
Unauthorized general ledger entries.	Access to general ledger entries is appropriate and authorized.
Improper System functionality	System functionality exists to segregate the posting and approval functions.
Absence of Automated Reconciliations	Automatic reconciliation process to confirm accuracy of accounts.
Absence of Automated Amortization	Automated amortization timing, periods and methods are appropriate and accurately entered.
Out-of-balance entries are not prohibited.	Out-of-balance entries are prohibited.
Variance reports	Variance reports are generated for use to identify posting errors/out-of-balance conditions.
System controls not in place	System controls are in place for appropriate approval of write-offs.
Account mappings not updated	Account mappings are up to date.

Master:

Risks	Control Objectives
General ledger master file change reports - Not generated by the system and are not reviewed	General ledger master file change reports are generated by the system and reviewed as necessary.
Standard chart of accounts – Not approved.	A standard chart of accounts has been approved by management and is utilized within all entities of the corporation.

Transaction:

Risks	Control Objectives
Reconciliation of general ledger balance- Not done	General ledger balances should be reconciled to sub ledger balances.
Absence of Automated reconciliation of interrelated balance sheets & income statement	Interrelated balance sheets and income statement accounts should undergo automated reconciliation to confirm accuracy of such accounts.
Incomplete & inaccurate account codes and transaction amounts	Account codes and transaction amounts should be accurate and complete, with exceptions reported.
Incomplete & inaccurate entries booked in the close process.	Entries booked in the close process should be complete and accurate.

Flow Charts

(20)Explain Flowcharts?

Answer:
- Flowcharts are used in preparing and documenting flow of different processes. They are generally used in designing and documenting simple processes or programs.
- Flowcharts help to visualise flow of processes and also helps to understand flaws, bottlenecks and other features within it.
- The two most common types of boxes in a flowchart are as follows:
    - a processing step, usually called activity, and denoted as a rectangular box.
    - a decision, usually denoted as a diamond.

(21)What are the steps of creating flowcharts?

Answer: Following are the steps for creating flowcharts for business processes:

(1)Identification of Process: First step will be to identify the business processes that are to be documented with a flowchart.

(2)Understanding of Process: Next step will be to have complete understanding of process flow.

(3)Rough Diagram: Create a rough diagram and confirm understanding of the process with business owner.

(4)Obtain Additional Information: Additional information to be obtained from the people involved in each step.

(5)Identification of Activities: In this step, activities involved in each step to be identified along with person responsible for each activity.

(6)Identification of Starting Point: Identify the starting point of the process. Starting points generally fall into one of several categories:

- – External events: Transaction is initiated from another business system.
- – Content arrival: For content management systems, the starting point might be the arrival of a new document or other form of content.
- – Human intervention: This includes customer complaints and other human intervention within or outside of the business.

(7)Identification of inter-connected steps: Identify each individual step in the process and how it is connected to the other steps.

(8)Define each step: Determine which action or activity completes each step. It is required to clarify who or what performs each step.

(22)What are the advantages of flowchart?

Answer: Following are some of the advantages of flowchart:

Effective	Efficient	Identifying
• Analysis • Communication • Documentation • Controls	• Coding • Debugging • Programme Maintenance	• Relationships • Responsibilities

(1)Effective Analysis:
- Flowchart helps in effective analysis of the problem and identification of new approaches.
- Through flowchart system can be divided into different activities for detailed analysis and study.

(2)Effective Communication:
- Flowchart helps in effective communication of details and facts to relevant parties.

(3)Effective Documentation:
- Flowcharts can be used as a good documentation for future reference.
- In the event of staff changes, they serve as training function for new employees.

(4)Effective Controls:
- Flowchart helps in identification and implementation of effective controls.

(5)Efficient Coding:
- Steps mentioned in flowcharts can be used as a guide during the system analysis and program preparation phase.

(6)Efficient Debugging:
- Flowchart acts as an important tool during program debugging.
- Flowchart can be used to detect and remove mistakes.

(7)Efficient Program Maintenance:
- Flowchart helps programmer to concentrate on selected activity for modification.

(8)Identifying Relationships:
- Flowchart helps in identifying and understanding the relationship between various elements of the application program/business process.

(9)Identifying Responsibilities:
- Flowchart helps in identification of roles and responsibilities for each activity.

(23)What are the limitations of flowchart?

Answer: Following are limitations of flowchart:

(1)Complex logic: Complex logic and technical details may make the flowchart complicated.

(2)Complex Standardization Process: Flowcharts cannot be easily translated into programming language and also not as easy as writing in plain English.

(3)Difficulty in Modification: In most of the scenario, complete re-drawing is required to modify the flowchart.

(4)Difficulty in Reproduction: Symbols used in flowcharts cannot be typed and hence reproduction of flowchart can be a problem.

(5)Link between conditions and actions: Sometimes it becomes difficult to establish appropriate linkage between conditions and the actions on such condition.

(24)List down important symbols used in a flowchart?

Answer: Following are some of the important symbols used in a flowchart:
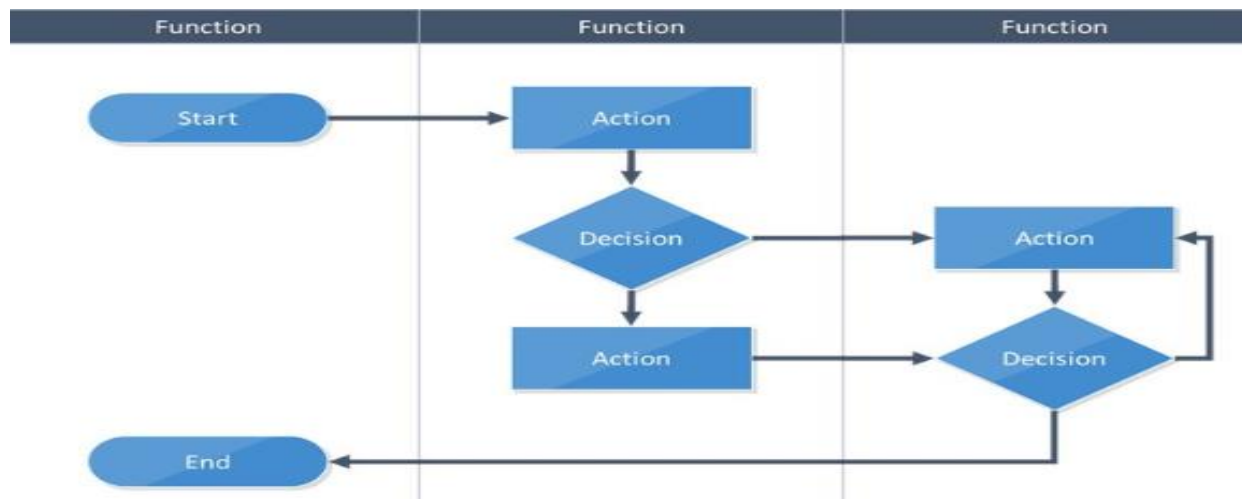
Data flow Diagrams
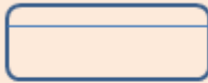
What are data flow diagrams (DFD)?

Answer:
- Data Flow Diagrams (DFD) indicates the flow of data or information from one place to another.
- DFD shows that how processes are linked together through data stores and how the processes are related to the users and the outside world.
- DFD provides an overview of :
    - What type of data is processed by system.
    - What types of transformations are performed.
    - What results are produced and where they flow.
    - What type of data is stored.
- In DFD, processes are identified to the function using "swinlanes". Each lane is represented by process owner who is responsible for implementing appropriate controls and to mitigate the risks.

(26)What are the main symbols used in data flow diagrams (DFD)?

Answer: Following are the main symbols used in data flow diagrams:

Symbols	Indicator	Description
	Process	Step by step instructions of Input-Transformation-Output.
	Data Flow	Data flow from place to place.
	External Agent	Source or destination of data outside the system.
	Data Store	Data at rest being stored for later use.
	Real Time Link	Back and forth communication as the process is executing.

Regulatory & Compliance Requirements

(27)Explain the salient features of section 134 & section 143 of Companies Act, 2013

Answer:
Two important Sections i.e. Section 134 and Section 143 of Companies Act, 2013 have direct impact on corporate governance structure of the organisations. Following are the some of salient features of them:

(i)Section 134:
- Directors' Responsibility Statement shall state that ' the Directors had taken proper and sufficient care for the maintenance of adequate accounting records in accordance with the provisions of this Act for safeguarding the assets of the company and for preventing and detecting fraud and other irregularities;
- the directors, in the case of a listed company, had laid down internal financial controls to be followed by the company and that such internal financial controls are adequate and were operating effectively.
- the directors had devised proper systems to ensure compliance with the provisions of all applicable laws and that such systems were adequate and operating effectively.

(ii)Section 143:
- Section 143(3) contains the auditor's report which states:"whether the company has adequate internal financial controls system in place and the operating effectiveness of such controls";
- "Adequacy and effectiveness of controls" refers to the adequacy of the control design and whether the control has been working effectively during the relevant financial year. The impact of this statement is that it involves continuous control monitoring during the year.

(28)What are the advantages of Cyber Law?

Answer:
Following are some of the advantages of cyber law from the perspective of e-commerce transactions in India:

(1)Electronic Record:
- The act recognizes 'electronic record' as evidence and provides ways to deal with cyber-crimes.

(2)Email Communications:
- Email would now be a valid and legal form of communication in India that can be duly produced and approved in a court of law.

(3)Digital Signatures:
- Digital signatures have been given legal validity and sanction in the Act.

(4)Digital Signature Certificates:
- The Act allows corporate companies in the business of being Certifying Authorities for issuing Digital Signatures Certificates.

(5)E-governance:
- The Act allows web based notification by Government thus promoting e-governance.
- The Act enables the companies to file any form, application or any other document in electronic form as may be prescribed by the appropriate Government.

(6)E-Commerce:
- The IT Act also addresses the important issues of information security to promote e-commerce.

(7)Statutory Remedy:
- Act provides statutory remedy (in the form of monetary damages not exceeding Rs. 1 crore) in case if anyone breaks into their computer systems or network and causes damages or copies data.

(29)What are some of the computer related offences that can be prosecuted under IT Act?

Answer: Following are some of the common cyber-crime scenarios which can attract prosecution as per the penalties and offences prescribed in IT Act:

Cyber Related	Email Related	Theft
•Cyber Terrorism •Cyber Pornography •Web Defacement •Sale of illegal Articles •Introduction of Malwares •Social Media Harassment	•Email Account Hacking •Phishing & Email Scams	•Theft of Confidential Information •Source Code Theft •Credit card fraud

(1)Cyber Terrorism:

- Physical storage media such as USB, hard disk drives etc. and virtual storage such as drive, FTP sites etc. are used by terrorist group to hide information and records of their illicit business.

(2)Cyber Pornography:
- Pornography (specifically child pornography) is illegal in many countries and this business is among the largest businesses on Internet.

(3)Web Defacement:
- Web defacement includes replacement of homepage of a website with a pornographic or defamatory page.
- Government sites generally face the web defacement of on symbolic days.

(4)Online sale of illegal Articles:
- Illegal articles such as narcotics, drugs, weapons and wildlife is sold through internet.

(5)Introduction of Malwares:
- Malwares such as viruses, worms, backdoors, root kits, Trojans and bugs are some sort of malicious programs which are used to destroy or gain access to some electronic information.

(6)Social Media Harassment:
- A fake profile is created by the third party with the purpose to harass the person whose profile is created. That person is labelled as 'prostitute' or a person of 'loose character'.

(7)Email Account Hacking:
- Hacker takes unauthorized control of victim's email account and fake/obscene emails are sent to people in victim's address book.

(8)Phishing and Email Scams:
- Through phishing, sensitive information is obtained through masquerading a site as a trusted entity (e.g. Passwords, credit card information).

(9)Theft of Confidential Information:
- Confidential information stored in computer systems is targeted by rivals, criminals and discontented employees.

(10)Source Code Theft:
- In this digital world, a Source code generally is the most critical and important asset of a company.

(11)Credit Card Fraud:
- Use of infected computers or networks for online transactions cans results into credit card fraud.

(30) Define sensitive personal information as per IT Act?

Answer: Rule 2(i) defines personal information as "information that relates to a natural person which either directly or indirectly, in combination with other information available or likely to be available with a body corporate, is capable of identifying such person."

Rule 3 defines sensitive personal information as:

- Passwords
- Financial information
- Physical/physiological/mental health condition
- Sexual orientation
- Medical records and history; and
- Biometric information

(31) List out the rules and procedures that constitute corporate governance framework? (May 19)

Answer: The corporate governance framework consists of:

- explicit and implicit contracts between the company and the stakeholders for distribution of responsibilities, rights, and rewards.
- procedures to address conflicting interests of stakeholders in accordance with their duties, privileges, and roles, and
- procedures for proper supervision, control, and information-flows to serve as a system of checks-and-balances.

MCQ Type Questions

(1)Which of the following is not a category of business processes?
(a)Management Processes
(b)Automated Processes
(c)Operational Processes
(d)Supporting Processes

(2)Following process is also known as a primary process?
(a)Management Process
(b)Automated Process
(c)Operational Process
(d)Supporting Process

(3)Which of the following is not the objective of business process automation?
(a)Staff Attrition
(b)Confidentiality
(c)Integrity
(d)Timeliness

(4)Which of the following is not the benefit of business process automation?
(a)Employee Satisfaction
(b)Improved Operational Efficiency
(c)Reduced Turnover Time
(d)Governance & Reliability

(5)Following process is also known as a secondary process?
(a)Management Process
(b)Automated Process
(c)Operational Process
(d)Supporting Process

(6)Which of the following is not the step of business process automation?
(a)Documentation
(b)Engage the business process consultant
(c)Benchmarking
(d)Testing the BPA

(7)Which of the following is not the benefit of Enterprise Risk Management?
(a)Improved Opportunities Management
(b)Improved Capital Allocation
(c)Increase in Turnover Time
(d)Minimizes operational losses

(8)Which of the following is not the component of Enterprise Risk Management?
(a)Internal Environment
(b)Objective Setting
(c)Risk Assessment
(d)Infrastructure

(9)Which of the following is not the component of Enterprise Risk Management?
(a)Control Activities
(b)Monitoring
(c)File & data transmission
(d)Risk Response

(10)Which of the following is the risk of business process automation?
(a)Align risk appetites and strategy
(b)Link growth, risk and return
(c)Enhance risk response time
(d)Data integrity

(11)Which of the following is not the risk of business process automation?
(a)Inaccurate Input
(b)Inaccurate Processing
(c)Enhance risk response time
(d)Data integrity

(12)Which of the following is not the type of business risk?
(a)Detection Risk
(b)Strategic Risk
(c)Compliance Risk
(d)Reputational Risk

(13)Which of the following is not the type of business risk?
(a)Financial Risk
(b)Operational Risk
(c)Control Risk
(d)Regulatory Risk

(14)Which of the following is not the component of Internal Control System?
(a)Internal Environment
(b)Risk Assessment
(c)Monitoring
(d)Infrastructure

(15)Which of the following is not the component of Internal Control System?
(a)Database
(b)Objective Setting
(c)Event Identification
(d)Risk Response

(16)Which of the following is not the limitation of Internal Control System?
(a)Abuse of responsibility
(b) Improper risk assessment
(c)Collusion within employees
(d) Manipulation by management

(17)Which of the following is not the advantage of flowchart?
(a)Quicker Reproduction
(b)Quicker grasp of Relationship
(c)Effective Analysis
(d)Effective Communication

(18)Which of the following is not the advantage of flowchart?
(a)Effective Documentation
(b)Easy Modification
(c)Effective Program Debugging
(d)Establishing Controls

(19)Which of the following is not the limitation of flowchart?
(a)Complex Logic
(b)Difficulty in Reproduction
(c)Difficulty in identifying responsibilities
(d)Difficulty in establishing link between conditions & actions

(20)Which of the following is not a flowcharting symbol?
(a)Decision
(b)Control
(c)Process
(d)Start

(21)Overview of which of the following is not provided by DFD:
(a)What type of data is processed by system.
(b)What types of transformations are performed by the system
(c)What kind of infrastructure is used by the system.
(d)What type of data is stored.

(22) Which of the following is not considered as sensitive personal information as per IT Act?

(a)Medical Reports
(b)Biometric Information
(c)Address.
(d)Passwords

(23) Which of the following Business Process Module includes the software designed specifically for production planning and management?
(a)Production Planning
(b)Material Management
(c)Finance Module
(d)Supply Chain Module

(24) Human Resource (HR) Management does not include:
(a)Payroll
(b)Career Development
(c)Training & Development
(d)Invoicing

(25) Mr. Yagnik ordered material for manufacturing of products and delivery was fixed "within 10 days from the date of order". State the subsequent stage of order to cash cycle:
(a)Collections
(b)Invoicing
(c)Delivery Note
(d)Order Fulfillment

(26) Offence of chatting on the internet under the name of some other person is:
(a)Punishable for offence related to web defacement
(b)Punishable for phishing and email scam
(c)Theft of confidential information
(d)Harassment via fake public profile on social networking site

(27) Which of the following is not an advantage of Flowchart?
(a)Easy modification
(b)Process can be broken down into detailed parts of a study.
(d)helps as a guide during the system analysis and program preparation phase.
(d)helps in communicating the facts of a business problem to arrive at the solution.

(28) Which of the following is not true about integration of Modules with Financial and Accounting System?
(a)Availability of same master data for all modules.
(b)Sharing of common transaction data with other modules wherever required.
(c)Use of Common Voucher types for each module.
(d)Use of Separate Voucher types for each module for easy identification of department recording it.

(29) Sharing of personal data without consent is violation of which rule of Sensitive Information and Personal Data Rules, 2011.
(a)Rule 6
(b)Rule 7
(c)Rule 8
(d)Rule 9

(30) Which of the following indicates 'decision' in flowchart:
(a)Diamond
(b)Circle
(c)Rectangle Box
(d)Square

(31) Which of the following indicates 'processing step' in flowchart:
(a)Diamond
(b)Circle
(c)Rectangle Box
(d)Square

(32) Which voucher type is to be used for writing off amount which is not to be recovered from customer?
(a)Journal
(b)Sales
(c)Purchases
(d)Contra

(33) Which of the following control is not available in Enterprise Resource Planning (ERP) systems:
(a)General Controls
(b)Application Controls
(c)Management Controls
(d)Business Continuity Controls

(34) Which module of ERP system, shall deal with Inventory Valuation as per AS-2 on "Inventory Valuation"?
(a)Supply Chain
(b)Controlling
(c)Production
(d)Human Resources

(35) Which report indicates increasing cash sales over a period of time?
(a)Management Information Systems (MIS)
(b)Receipt and payment
(c)Cash and fund flow
(d)Balance Sheet and Profit/Loss Account

(36) Under which IT Offence, punishment is given for statement given below: "Whoever fraudulently or dishonestly make use of electronic signature, password or any other unique identification feature of any other person."
(a)Section 66- B
(b)Section 66- C
(c)Section 66- D
(d)Section 66- E

Answer to MCQs (Chapter -1)

Question No.	Answer Key	Question No.	Answer Key
1	b	23	a
2	c	24	d
3	a	25	c
4	a	26	d
5	d	27	a
6	c	28	c
7	c	29	a
8	d	30	a
9	c	31	c
10	d	32	a
11	c	33	d
12	a	34	b
13	c	35	a
14	d	36	b
15	a	-	-
16	b	-	-
17	a	-	-
18	b	-	-
19	c	-	-
20	b	-	-
21	c	-	-

Chapter 2 – Financial & Accounting Systems

This chapter deals with various provisions and aspects of financial & accounting systems and covers following important topics:

- Integrated & Non-Integrated Systems
- Enterprise Resource Planning (ERP) System
- Business Process Module
- Reporting Systems & Management Information Systems
- Data Analytics & Business Intelligence
- Business Reporting & fundamentals of XBRL
- Regulatory & Compliance Requirements
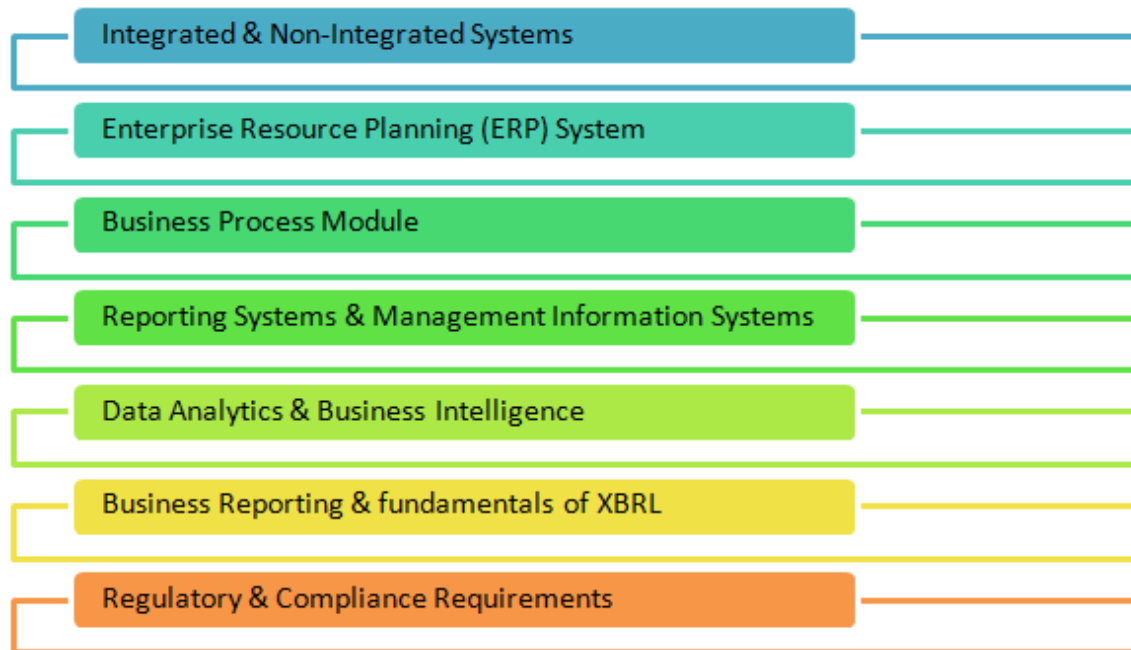
Integrated & Non-Integrated Systems

(1)What is a system?

- A system can be defined as a set of detailed methods, procedures and routines created to carry out specific activity or to perform a duty or to solve a problem.
- All systems generally have:
  a. inputs, outputs and feedback procedures,
  b. consistent steady state inspite of changing external environment,
  c. boundaries as defined by system observer.
- Within a larger system, there may be few sub-systems.

(2)What is a process?

Answer:
- A process is defined as a sequence of events that processes inputs for desired outputs.
- In business terms, a process is standard flow of activities performed by people or machines to achieve a business objective.
- Process creates value for customers i.e. internal or external.
- Example of process is sequence of activities starting from taking customer order, filling that order and issuing customer invoice.

(3)What are the types of data in Financial and Accounting Software? Differentiate between them.

Answer: In every accounting system data is stored in two ways:

- Master Data: Permanent Data (i.e. not expected to change frequently)
- Non-Master Data: Non-permanent Data (i.e. expected to change frequently)

Master data & non-master data can be differentiated in following ways:

Master Data	Non-master Data
As defined above, master data is relatively permanent data that is not expected to change again and again.	It is a data which is expected to change frequently, again and again and not a permanent data.
They are generally non-transaction related data.	They are generally transaction related data.
Master data is generally not typed by the user; it is selected from the available list.	Non-master data is typed by the user and not selected from available list. as it is a non-permanent and it keeps on changing again and again
Master data entry is usually done less frequently say once a year or when there is a need to update.	Non-master data entry is done on more frequent basis.
Example: Voucher Types i.e. Receipt Voucher/Payment Voucher etc.	Example: Transaction details like amount/date/voucher number/narration etc.

(4)Discuss types of Master Data in financial & accounting systems. (May 19)

Answer: Master data is relatively permanent data that is not expected to change again and again. Following are some of the master data in financial & accounting systems:

Accounting Master Data:
- This includes names of various ledgers, voucher types, cost centres etc.
- E.g. various ledgers like capital account, sales, purchase, expenses and income ledgers are created once and not expected to change again and again.

Inventory Master Data:
- This includes inventory related master data like stock items, storage units, inventory vouchers type etc.
- For business of consumable goods stock items can be television, air-Conditioner, fridge etc.

Payroll Master Data:
- This includes employees related master data like name of employees, group of employees, salary structure, payment heads etc.
- These data are not expected to change frequently. E.g. Employee created in the system will remain valid for relatively longer period of time.

Statutory Master Data:
- This includes master data related to various statute/law. This data shall be relatively permanent.

- E.g. Rate of Goods and Service Tax (GST), Nature of Payments for TDS etc. In case of change in tax rates, forms, categories, we need to update/change our master data.

All business process modules must use common master data.

(5)What are the types of voucher in Financial and Accounting Software?

Answer: In accounting language, a Voucher is a documentary evidence of a transaction. In accounting, every transaction, before it is recorded in the accounting system, must be supported by a documentary proof. Generally following types of vouchers are used in accounting systems:

Module	Voucher Type	Purpose
Accounting	Payment	Recording of all types of payments.
	Receipt	Recording of all types of receipts.
	Sales	Recording all types of trading sales.
	Purchase	Recording all types of trading purchases.
	Journal	Recording of all non-cash/non-bank transactions. E.g. depreciation, write-off, discount given/received etc.
	Credit Note	Recording of changes/corrections in already entered sales/purchase transactions.
	Debit Note	Recording of changes/corrections in already entered sales/purchase transactions.
Inventory	Sales Order	Recording of a sales order received from a customer.
	Purchase Order	Recording of a purchase order raised by a vendor.
	Delivery Note	Recording of delivery of goods to a customer.
	Receipt Note	Recording of receipt of goods.
	Stock Journal	Recording of movement of stock from one location to another.
Payroll	Attendance	Recording of attendance of employees.
	Payroll	Recording of salary calculations.

(6)Discuss Accounting Flow process in detail.

Answer: Following diagram describes accounting flow process:

Transaction — Voucher Entry — Posting — Balancing — Trial Balance — Profit & Loss / Balance Sheet

- Out of above 7 steps, first 2 steps (i.e. transactions and voucher entry) require human intervention. However, there can be few instances where voucher entry may be automated and can be performed through system.
- Remaining five steps are mechanical steps and can be performed by software with high speed and accuracy.

- Also, last five steps, (i.e. Posting, Balancing, Trial Balance, Profit & Loss Account and Balance Sheet preparation) requires huge amount of time and efforts, if performed manually.

Enterprise Resource Planning (ERP) System

(7)What are the advantages of ERP System?

Answer: Following are some of the advantages of ERP system:

- Today's ERP systems can cover a wide range of functions and integrate them into one unified database.
- Ability to customize an organization's requirements.
- Ability to integrate business operations with accounting and financial modules.
- Ability to automate manual processes thus reducing errors.
- Ability to process huge volumes of data within short time frames.
- Enhanced data security and application controls.
- Enhanced access controls and segregation of duties controls.
- Enhanced reporting capabilities for management.

(8)List down features of an ideal ERP System. (May 19)

Answer: Following are some of the ideal features of ERP system:

- An Ideal ERP System satisfies all types of needs of an organization and provides right data and right point of time to right users for their purpose.
- An ideal ERP system is that system where a single database is used and stores all data for various modules.
- Following are some of the modules used in an ideal ERP system:

Manufacturing	Module includes functions like manufacturing process, workflow management, engineering, capacity, quality control etc.
Financials	Module includes accounts and finance related functions like cash management, accounts payable, accounts receivable and fixed assets etc.
Human Resources	Module includes functions like payroll, attendance and training etc.
Supply Chain Management	Module includes functions like Inventory management, purchasing and other supply chain activities.
Projects	Module includes functions of specific projects like activity management, costing, billing and time and expense, etc.
Customer Relationship Management (CRM):	Purpose of CRM software is to improve services provided to customers and to use the information in the system for improving sales.
Data Warehouse	Data warehouse is a repository of an organization's electronically stored data. It facilitate reporting and analysis.

(9)List down the risks & controls applicable in an ERP environment.

Answer: Following are applicable risks and relevant controls for an ERP environment:

Aspect	Risk Associated	Control Required
Data Access	Risk of unauthorized data access. Data is stored centrally and all the departments access the central data. This creates a possibility of access to unauthorized data.	Access to be given on "Need to know" and Need to do" basis only.
Data Safety	Risk of data loss may impact business. In case data is lost, whole business may come to stand still.	Strong Back up arrangement is required. Also strict physical control is needed for data.
Speed of Operation	Due to huge data base, speed of operation may be reduced.	This can be controlled by using techniques like data warehousing, updating hardware and removing redundant data.
Change in process	Due to integration, even a small change in process requires lot of efforts and money.	Appropriate documentation to avoid any discomfort.
Staff Turnover	In case of staff turnover, it becomes difficult to maintain the system. Integrated systems may be difficult to understand for new employees.	This can be controlled and minimized with help of proper staff training system, having help manuals, having backup plans for staff turnover, etc.
System failure	Risk of system failure may impact whole organization as everything will be centralized in an ERP environment.	Appropriate system and data back-up and alternate hardware/internet provisions are required to ensure functioning of system. In case of failure of primary system, secondary system may be used.

(10)What points to be considered while auditing ERP systems?

Answer: Following points to be considered while auditing ERP systems:

- The primary objectives of an audit of controls do not change in an ERP environment.
- Following are some of the important questions auditor should ask during ERP audits:

    – Does the system process according to GAAP (Generally Accepted Accounting Principles) and GAAS (Generally Accepted Auditing Standards)?
    – Does the system ensure confidentiality of information?
    – Does the system ensure integrity of information?
    – Does the system ensure availability of information?
    – Does the system ensure regulatory requirements?
    – Is there a problem-escalation process?

In any ERP system, following auditing aspects to be considered:

(i)Auditing of Data:

Physical Safety: To ensure appropriate physical control over data.

Access Control: To ensure that system access is given on "need to know" and "need to do basis".

(ii)Auditing of Processes:

Functional Audit: To ensure that different functions / features in the system are working properly and testing of the overall process .E.g. Purchase Process, Sales Process etc.

Input Validations: This stands for checking of rules for input of data into the system. E.g. backdating not to be allowed, amount field must not be zero, stock item field shall not be empty, etc. Input validations shall change according to each data input form.

(11) Major features of an ERP system is central database. Which are the options possible to different users while assigning access to it? (May 19)

Answer: Following options are available for accessing to ERP system:
- Create – Allows to create data
- Alter – Allows to alter data
- View – Allows only to view data
- Print – Allows to print data

Above type of access can be allowed / disallowed for:
- Master Data
- Transaction Data
- Reports

(12) Describe Role – based Access Control (RBAC) mechanism in ERP systems?

Answer:
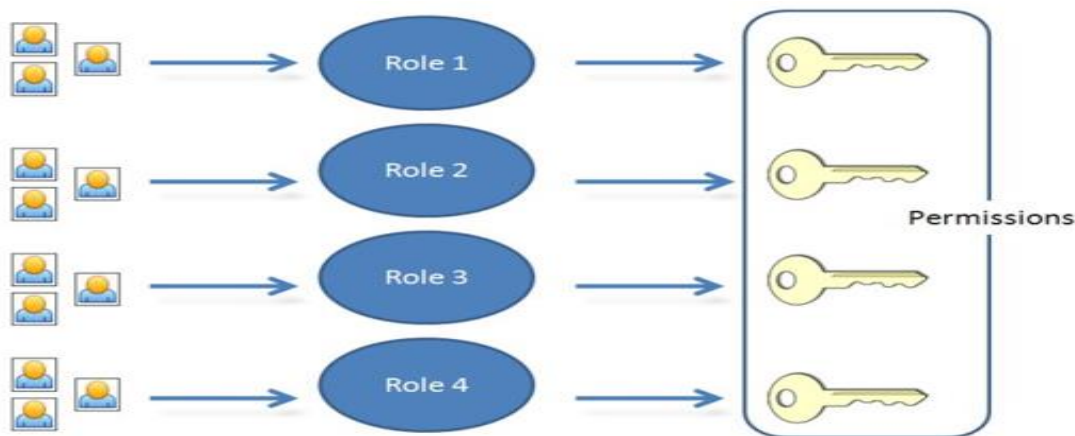
- In Role-based access control (RBAC), access is given to only authorized users.
- RBAC is also referred to as Role-Based Security.
- The components of RBAC such as role-permissions, user-role and role-role relationships make it simple to perform user assignments.
- RBAC can be used in large organizations with hundreds of users and thousands of permissions and helps in security administration.

- Access to the system can be given according to the role assigned. E.g. a accountant is assigned a role of recording basic accounting transactions or an employee in human resource department is assigned a role of gathering HR data for salary calculations etc.

Business Process Module and their integration with Financial & Accounting Systems

(13) List down some of the Business Process Modules in ERP System.

Answer: Business process may change per type of business. Hence different modules are possible in an integrated system. Following are some of the modules that may be part of ERP system:

Finance Related	Sales Related	Production Related	HR Related	Customer Related
• Financial Accounting • Controlling	• Sales & Distribution • Supply Chain	• Production Planning • Material Management • Quality Management • Plant Maintenance • Project Management	• Human Resource	• CRM

(1) Financial Accounting Module:
- This module is the most significant module of entire ERP System. Every module is somehow connected with this module.
- This module tracks the flow of financial data across the organization in a controlled manner and integrates all the information for effective strategic decision making.
- This module facilitates Integration with Sales and Distribution and Materials Management.

(2) Controlling Module:
- This module helps in analyzing the actual figures with the planned data and in planning business strategies.
- Cost Elements and Revenue Elements are managed in Controlling.
- Key features of this module are as under.
    - (i) Cost Element Accounting
    - (ii) Cost Center Accounting;
    - (iii) Activity-Based-Accounting
    - (iv) Internal Orders;
    - (v) Product Cost Controlling
    - (vi) Profitability Analysis
    - (vii) Profit Center Accounting

(3) Sales & Distribution Module:
- Sales and Distribution is one of the most important module.

- Sales and Distribution can monitor number of activities that take place in an organization such as sales enquires, quotation, placing order, pricing, scheduling deliveries etc.
- Following are some of the Key features of Sales and Distribution Module:
    - (i) Updating Organization Structure
    - (ii) Assigning Organizational Units
    - (iii) Updating Pricing Components
    - (iv) Setting up sales document types, billing types, and tax-related components
    - (v) Pre - Sales Activities like identifying prospective customers, contacting them and fixing appointments, showing demo, submission of quotations, etc.
    - (vi) Inventory management before delivery of goods to ensure that goods are ready and available for delivery.
    - (vii) Billing – This is a transaction of raising an invoice against the delivery of material to customer.
    - (viii) Receipt from Customer – Transaction involving receipt of money from customers against sales invoice. This shall have a linking with sales invoice.

(4) Supply Chain Module:
- This module provides functionality for logistics, manufacturing, planning, and analytics.
- Organisation can optimize their supply chain in advance and streamline processes such as supply network, demand, and material requirement planning.
- This module helps to create complete scheduling; improve production integration, and maximize transportation scheduling.

(5) Production Planning Module:
- Production Planning aids in planning and management of production.
- This module contains master data, system configuration and transactions in order to achieve plan procedure for production.

(6) Material Management Module:
- This module manages materials required, processed and produced in enterprises.
- Some of the popular sub-components in this module are vendor master data, consumption data, purchase data, inventory data and so on.
- Material Management module also interacts with other module such as logistics, Supply Chain and warehouse management for movement of materials.
- It must be noted that Purchase Order and Material Receipt does not affect trial balance. But these transactions are part of overall Financial and Accounting System.

(7) Quality Management Module:
- Quality Management Module helps in management of quality in productions and other processes in an organization.
- This module aids in improving business performance by adopting a structured and functional way of managing quality in different processes.
- Quality Management module collaborates with other modules such as procurement and sales, inspection, control, audit management, production, planning and so on.

(8) Plant Maintenance Module:

- This module handles maintaining of various equipment and helps in efficient planning of production and generation schedules.
- Plant Maintenance module provides solution for all maintenance activities that are performed within a company.
- It aids in cost-efficient maintenance methods like risk-based maintenance or preventive maintenance.
- It also provides comprehensive outage planning and powerful work order management.

(9) Project Management Module:
- This is an integrated project management tool used for planning and managing projects.
- It has several tools to support project management process such as cost and planning budget, scheduling, requisitioning of materials and services.

(10) Human Resource Module:

Single Module for all HR functions	This module takes care of various HR related task such as recruitment, performance evaluation, managing promotions, compensations, handling payroll and other related activities.
Employee Database	This module maintains total employee database.
No integration with other modules	This module exchanges very few information with other modules.
Capturing Attendance	(i)Important function of this module is to capture attendance of every employee. (ii)Usage of magnetic card or finger print recognition devices will help to improve the attendance system and discard proxy attendance.
Holiday list	From Holiday master provided with the module the user could feed all possible holidays at the beginning of a year, so leave related information can be automated.
Employee Advances	Financial entries like advance or loan to employees are also captured in this module.
Authorized Access	Details in the module will be password protected. Only authorized person will be eligible to access information from this module.

(11) CRM Module:
- Objective of CRM (Customer Relationship Management) is to improve relationship with existing customers, to find new prospective customers, and to win back former customers.
- CRM stores information about customers which includes determining the requirements of high-value customers.
- The CRM module uses the existing ERP tables as the source of its data. This is primarily the Contact, Customer, and Sales tables. CRM does not exchange transactions with other modules as CRM does not have transactions. Generally, a large ERP system have inbuilt CRM module.
- Implementing a CRM strategy is advantageous to both small-scale and large-scale business ventures.

(14) What are the key benefits of CRM module? (May 19)

Answer: Following are the Key benefits of a CRM module:

Better Relationship	Marketing	Revenue
•Better Customer Relationship •Better Internal Relationship	•Optimize Marketing •Maximize upselling & cross-selling	•Increase in Revenue

(1) Better customer relations:
- By using CRM, all dealings with customer for servicing, marketing, and selling can be carried out in an organized and systematic way.
- This in turn helps in increasing customer loyalty and decreasing customer agitation.

(2) Better internal relations & communication:
- CRM helps in building up better communication within the company.
- The sharing of customer data between different departments will enable them to work as a team. And thus help in increasing the company's profitability and enabling better service to customers.

(3) Optimize marketing:
- CRM helps to understand most profitable customer groups, ideal marketing timing and correct product.
- In this way, marketing resources can be optimized efficiently and time is not wasted on less profitable customer groups.

(4) Maximize up-selling and cross-selling:
- Up-selling and cross-selling can be improved by interacting with the customers and getting an idea about their wants, needs, and patterns of purchase.
- Up-selling is the practice of giving customers premium products that fall in the same category of their purchase.
- Cross selling is the practice of offering complementary products to customers, based on their previous purchases.

(5) Increase in revenues:
- By using a CRM strategy for any business, the revenue of the company can be increased.
- Using the data collected, marketing campaigns can be popularized in a more effective way.

Reporting System & Management Information Systems (MIS)

(15)What are the criteria to be followed for making information most useful?

Answer: Following criteria need to be followed for making information most useful:

(1)Relevant:
- Information should be relevant to the business area they address.
- This is important because a report that includes unnecessary information might be ignored.

(2)Timely:
- Many times old information may not be relevant in current time.
- Managers need to know what's happening now or in the recent past to make decisions about the future.

(3)Accurate:
- Accuracy of the information is of utmost importance.
- Managers and others who rely on MIS reports can't make sound decisions with information that is wrong.

(4)Structured:
- Structured Information helps management understand what the report is saying.
- Try to break long passages of information into more readable blocks or paragraphs and give theme meaningful headings.

Data Analytics & Business Intelligence

(16)What do you understand by term 'Data Analytics '?

Answer:
- Data Analytics is the process of examining data sets to draw conclusions about the information they contain.
- Data Analytics is done with the aid of specialized systems and software.
- Data analytics technologies and techniques are widely used in commercial industries to enable organizations to make more-informed business decisions.
- Data Analytics initiatives can help businesses with following advantages:
  - rise in revenues,
  - improve operational efficiency,
  - improve marketing campaigns,
  - improve customer services,
  - act more rapidly to emerging market trends and gain a competitive edge over rivals.

(17)Explain the types of data analytic applications.

Answer: Following are some of the types of data analytics:

Types	Details
EDA & CDA	(i)At upper level, data analytics methodologies include EDA (Exploratory Data Analysis) & CDA (Confirmatory Data Analysis). (ii) EDA aims to find patterns and relationships in data and CDA applies in statistical techniques to determine whether hypotheses about a data pattern are true or false. (iii)EDA is often compared to detective work, while CDA is similar to the work of a judge or jury during a court trial.
Qualitative & Quantitative	(i)Data Analytics can also be bifurcated as quantitative data analysis and qualitative data analysis. (ii)Quantitative Analysis includes numerical data that can be compared or measured statistically. (iii)Other approach i.e. qualitative approach is more interpretive. It deals with non-numerical data like text, images, audio and video.
Business Intelligence (BI)	(i)Business Intelligence (BI) and reporting provide information about key performance indicators, business operations, customers and more. (ii)Earlier, data queries and reports were created for end users by BI developers however now self-service BI tools are available that let executive level employees design their own ad hoc queries and build reports themselves.
Data Mining	Data mining involves analysis and sorting of large data sets to identify trends, patterns and relationships.
Predictive Analytics	Predictive analytics aims to predict customer behaviour, equipment failures and other future events.
Machine Learning	Machine learning is an artificial intelligence technique that uses automated algorithms to analyse the data sets more quickly than data scientists can do via conventional analytical modelling.
Big Data Analytics	Big data analytics applies data mining, predictive analytics and machine learning tools to sets of big data that often contain unstructured and semi-structured data.
Text Mining	Text mining supports analyzing documents, emails and other text-based content.

(18)What do you understand by term 'Business Intelligence'? Explain with examples.

Answer:
- Business Intelligence (BI) is a technology-driven process for analyzing data and presenting meaningful information to help users make more informed business decisions.
- BI comprises of various tools, applications and methodologies to:
  - collect data from internal and external sources,
  - prepare it for analysis,
  - design and run queries against the data,
  - create reports, dashboards and data visualizations for users.
- Following are the some of the benefits of BI :
  - improved decision making
  - improved business processes,
  - improved operational efficiency,
  - driving new revenues,
  - gaining competitive advantages over business rivals.
  - opportunity to identify market trends and spot business problems that need to be addressed.
- BI data supports both strategic and tactical decision-making processes.
- Business Intelligence combines a broad set of data analysis applications which includes:

- ad hoc analysis and querying,
- enterprise reporting,
- online analytical processing (OLAP),
- mobile BI,
- real-time BI,
- operational BI,

- BI programs also include advanced analytics such as data mining, predictive analytics, text mining, statistical analysis and big data analytics.

- Example of BI includes ability to answer below mentioned queries:
    - How many products sold in a specific area for a given time period?
    - Effect of decline in inventory level. What is the revenue loss?
    - Impact of customer profile and sales revenue. Can customer profile changes support a high- priced product?

Business Reporting & fundamentals of XBRL

(19) What is business reporting and why it is important?

Answer:
- Business Reporting includes (i) public reporting of operating and financial data by a business enterprise (ii) regular input of information to decision-makers within an organization to help them for their work.
- Reporting helps in improved business intelligence and knowledge management.
- Implementation involves Extract, Transform, and Load (ETL) procedures in coordination with a data warehouse and then using one or more reporting tools.
- Wide range of reporting is conducted such as financial, regulatory and environmental, social, and governance (ESG) reporting, integrated reporting etc.

Importance of Business Reporting:
- Business reporting allows organizations to present a consistent explanation of their business performance.
- Business reporting helps the organization to be engaged with internal and external stakeholders such as employees, shareholders, customers and regulators.
- Business reporting is crucial for stakeholders to assess organizational performance and make informed decisions with respect to an organization's capacity to create and preserve value.
- High-quality reporting is effective in reducing the risk for lenders and thus lowers the cost of capital.
- Reports with high quality promote more effective and better internal decision-making. High-quality information is essential to the successful management of the business, and is one of the important factors of sustainable organizational success.

(20) What is the purpose of 'XBLR' and what are the features of 'XBLR'?

Answer:
- XBRL (eXtensible Business Reporting Language) is a freely available and global standard for exchanging business information.
- XBRL is used in more than 50 countries. XBRL helps in creating more useful, more effective and more accurate digital versions replacing older, paper-based reports.
- XBRL ensures information move between organizations rapidly, accurately and digitally. XBRL is a standards-based way to communicate and exchange business information between business systems.
- These interactions are defined by metadata set out in taxonomies.
- The language is XML-based and uses the XML syntax and related XML technologies such as XML Schema, XLink, XPath, and Namespaces.
- Following are important features of XBLR:
    - **Clear Definition:** XBRL allows the creation of reusable, authoritative definitions, called taxonomies. Taxonomies are developed by regulators, accounting bodies, government agencies and other groups that need to clearly define information that needs to be reported upon.
    - **Testable Business Rules:** XBRL allows the creation of business rules. Business rules can be logical or mathematical, or both.
    - **Multi-lingual Support:** XBRL allows concept definitions to be made available in different languages. Translations of definitions can also be added by third parties. These automatically open up reports to different communities.
    - **Strong Software Support:** XBRL is supported by a very wide range of software and thus can be acceptable by all size of the organization.

(21)List down users of 'XBLR'?

Answer:
- The international XBRL consortium is supported by more than 600 member organizations, from both the private and public sectors.
- XBRL is used for different purpose and by different entities including by:
    - **(i)   Regulators:**
        - Financial regulators that manage complex performance and maintains risk information about the institutions that they regulate.
        - Securities regulators and stock exchanges that need to monitor the compliance of listed companies and securities.
        - Business registrars that need to maintain and publish a range of corporate data to general public.
        - Tax authorities that need financial and other compliance information from companies to monitor their corporate tax affairs.
        - Statistical and monetary policy authorities that analyze financial performance information from many different organizations.
    - **(ii) Companies:**
        - Companies that need to provide information to one or more of the regulators.
        - Enterprises that need to accurately move information in a complex structure.

- Supply chains that need to exchange information within group for risk management.

(iii) Governments:

Government agencies that are simplifying and improving reporting process by either harmonizing data definitions or consolidating reporting obligations.

(iv) Data Providers:

Entities involved in providing data, create comparisons, ratings and other value-added information products for other market participants.

(v) Analysts and Investors:

- Analysts that need to understand market performance and risk.
- Investors that need to evaluate various investments and understand the performance of existing investments.

(vi) Accountants:

Accountants use XBRL to support various reporting obligations of the clients and are often involved in the preparation of XBRL reports.

(22) What is XBRL tagging?

Answer:
- XBRL Tagging is the process by which any financial data is tagged with the most relevant element in an accounting taxonomy (a dictionary of accounting terms).
- As all XBRL reports use the same taxonomy, information is comparable irrespective of how they are described by those releasing the financial statements.
- Due to same taxonomy, information in reports prepared using the XBRL standard is interchangeable between different information systems. This allows for the exchange of business information in entirely different organizations.
- XBRL has the capability to allow the tagging of transactions that can themselves be consolidated into XBRL reports.

Regulatory & Compliance Requirements

(23)What are pros & cons of having single system for accounting & tax compliance?

Answer: Following table shows pros & cons of having single system for accounting & tax compliance:

Particulars	Combined Accounting & Tax Software	Only Tax Compliance Software
Ease of software operation	Relatively less ease due to integration of two different module.	More ease of operation.
System features	Tax module will have relatively less system features as this is not exclusive system for tax compliance.	More system features will be there as this will exclusive and specifically designed system for tax compliance.

Time & Efforts	Less time and efforts are required for transfer of information due to integration.	More time and efforts are required for transfer of information from accounting system to tax system.
Accuracy	More accurate information as systems are integrated.	Comparatively less accurate as possibility of mismatch between accounting and tax system is always there.
Cost	More costly as two different systems are integrated.	Comparatively less costly is required.

MCQ Type Questions

(1)Which of the following is not a part of Inventory Master Data?
(a)Storage Units
(b)Stock Items
(c)Warehouse
(d)Payroll Details

(2)Which of the following is wrong statement about Back End?
(a)direct communication with user
(b)involved in data processing
(c)direct communication with frond end
(d)report generation

(3)What is the impact if Cash ledger is grouped under other income:
(a)It will appear in balance-sheet as it is cash ledger.
(b)It will appear in profit and loss account
(c)It will not appear anywhere. It shall still be considered in balance sheet as it is a cash ledger
(d)Software will prevent such error.

(4)Which of the following is the first step of accounting flow process ?
(a)posting
(b)trial balance
(c)transactions
(d)voucher entry

(5)Which of the following is not the voucher type of payroll module?
(a)attendance
(b)payroll
(c)purchase
(d)none of the above

(6) Which of the following is a foremost feature of Integrated ERP System?
(a)Decentralised data maintenance by each department
(b)Centralised Database
(c)Lack of direct inter department communication
(d)Not able to integrate various business modules

(7)What is the full form of ERP?
(a)Employee Resource Policy
(b)Enterprise Resource Points
(c)Enterprise Resource Policy
(d)Enterprise Resource Planning

(8)Software application is installed in:
(a)hard disk of the computer
(b)Web server
(c)cloud
(d)Website

(9)Which of the following is not the advantage of ERP system?
(a)ability to integrate different modules.
(b)ability to customize as per requirement.
(c)reduced data security and application controls.
(d)strong reporting capabilities.

(10)Which of the following is not the risk in an ERP environment?
(a)Risk of unauthorised changes in data.
(b)Risk of data leakage.
(c)Risk of decentralized database.
(d)Risk of loss of data.

(11)Which of the following is not the benefit of CRM module?
(a)Optimize marketing
(b)Better communication
(c)Improve cross-selling
(d)Estimate re-order level

(12)Which of the following is not the function of Human Resource module?
(a)Employee database
(b)Database of high value customers
(c)Attendance record
(d)Payroll record

(13)Which of the following is not the sales & distribution process?
(a)Sales order
(b)Material delivery
(c)Purchase requisition from production department
(d)Billing

(14)Which of the following module tracks financial data across organization?
(a)Sales & distribution module
(b)Material management module
(c)Financial accounting module
(d)Human Resource Module

(15)Which of the following module is somehow connected with all other modules?
(a) Human Resource Module
(b)Purchase Module
(c)Financial accounting module
(d) Sales & distribution module

(16)Extract, Transform & Load (ETL) is a process followed in:
(a)Enterprise Reporting
(b)Stock Management
(c)Sales Accounting
(d)Financial Accounting

(17)Which of the following is not an attribute of Information?
(a)Availability
(b)Confidential
(c)Accurate
(d)Inadequate

(18)Which of the following is not a criteria for making information useful?
(a)Relevant
(b)Numerical
(c)Accurate
(d)Timely

(19)Which of the following is a criteria for making information useful?
(a)Qualitative data
(b)Numerical data
(c)Structured data
(d)Quantitative data

(20)Full form of OLAP is:
(a)Online Analytical Price
(b)Offline Analytical Price
(c)Online Analytical Processing
(d)Offline Analytical Processing

(21)Which of the following is not an advantage of data analytics initiatives?
(a) driving new revenues
(b)improves operational efficiency
(c)improves decision making
(d)loosing competitive advantage

(22)Which of the following is not a BI tool?
(a)data mining
(b)predictive analysis
(c)data capturing
(d)text mining

(23)Which of the following is not an advantage of BI tool?

(a)improved decision making
(b)improved business processes
(c)driving new revenues
(d)improved employee turnover

(24)Which of the following uses XBRL:
(a)Regulatory bodies only
(b)Data providers only
(c)Analyst & Investors only
(d)All of above

(25)What is XBRL tagging?
(a)XBRL Tagging is the process by which any financial data is tagged with the most relevant element in an accounting taxonomy.
(b) XBRL Tagging is the process by which any financial data is tagged in ascending order of appearance.
(c) XBRL Tagging is the process by which any financial data is tagged in descending order of appearance.
(d)XBRL Tagging is the process by which any financial data is tagged with random element in an accounting taxonomy.

(26)Which of the following is not a feature of XBRL?
(a)Clear Definitions
(b)Single language support
(c)Testable business rules
(d)Strong software support

(27)Generally, organizations do not communicate with their all stakeholders about:
(a)mission, vision, objectives, and strategy
(b)risk management & governance structure
(c)confidential business documents
(d)financial, social, and environmental performance.

(28)Which of the following is an advantage of integrated accounting & tax software ?
(a)more ease of operation as compared to only tax compliance software.
(b)more system features as compared to only tax compliance software.
(c)more accurate flow of information as compared to only tax compliance software.
(d)less costly as compared to only tax compliance software.

(29) For recording physical receipts of goods purchased from a vendor, which Voucher type shall be used?
(a)Delivery Note
(b)Receipt Note
(c)Debit Note
(d)Credit Note

(30) Voucher Type "Contra" of the Accounting System does not include:
(a)Cash deposit in bank
(b)Cash withdrawal from bank
(c)Cash transfer from one location to another
(d)Credit Sales

(31) Mr. Yagnik hacks the data of valuable customers of a company and then sold the same to its competitor. This act is known as:
(a)Source code theft
(b)Theft of confidential information
(c)Phishing
(d)Hacking

(32) Rule for voucher numbering does not include:
(a)Unique number for each voucher.
(b)A voucher number may either have prefix or suffix or both.
(c)Voucher numbers may be numbered randomly.
(d)Every voucher type shall have a separate numbering series.

(33) In case of a single system and database, which of following is required to protect business?
(a)Single system can be controlled and monitored by having proper and updated backup of data as well as alternate hardware/internetarrangements.
(b)Single can be controlled by removing redundant data, using techniques like data warehousing and updating hardware on a continuous basis.
(c)Proper access rights to be implanted.
(d) Proper staff training system should be given.

(34)In case of a large database speed of operations is reduced. Which of following is required to protect business?
(a)This can be controlled and monitored by having proper and updated backup of data as well as alternate hardware/internetarrangements.
(b)This can be controlled by removing redundant data, using techniques like data warehousing and updating hardware on a continuous basis.
(c)Proper access rights to be implanted.
(d) Proper staff training system should be given.

(35) Extensible Business Reporting Language (XBRL) is used by:
(a)Companies
(b)Government
(c)Regulator
(d)All of above

(36) In case of disaster, an entity not having a proper back-up of data is faced with huge business risk. The same (risk) is dealt in which accounting standard issued by ICAI, New Delhi.
(a)AS - 2
(b)AS - 1
(c)AS - 9
(d)AS – 28

Answer to MCQs (Chapter -2)

Question No.	Answer Key	Question No.	Answer Key
1	d	21	d
2	a	22	c
3	b	23	d
4	c	24	d
5	c	25	a
6	b	26	b
7	d	27	c
8	a	28	c
9	c	29	b
10	c	30	d
11	d	31	d
12	b	32	c
13	c	33	a
14	c	34	a
15	c	35	d
16	a	36	b
17	d	-	-
18	b	-	-
19	c	-	-
20	c	-	-

Chapter 3-Information System & Its Components

This chapter deals with various provisions and aspects of information systems & it's components and covers following important topics:

- Information Systems
- Components of Information System
- Information Systems' Controls
- Classification of Information Systems Controls
- Information System Auditing
- Audit Trail
- Organization's Structures & Responsibilities
- Segregation of Duties
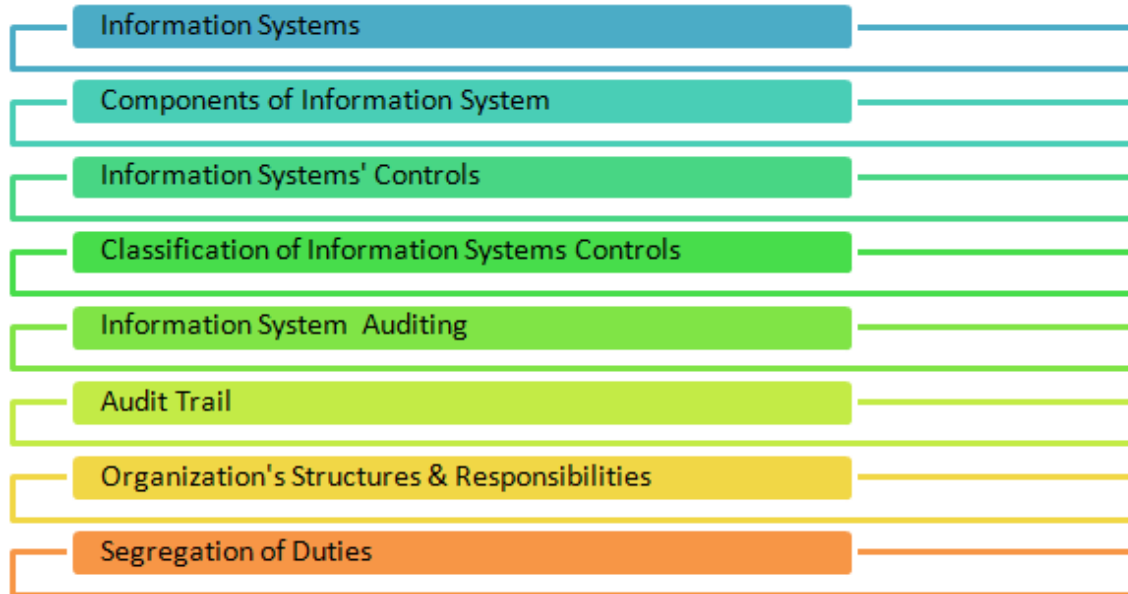
Information Systems

(1)Define the term 'Information'?

Answer:

- It is important to understand the difference between Data and Information.
- Data is a raw fact such as a date or a measurement.
- When data is processed to derive some meaning, it is converted into information.
- This process involves collection of data and then transforming them in order to create information.
- Some examples of information include totalling of all the number or average of all the number to arrive at some information.

(2)Define the term 'System'?

Answer: The system can be defined as:
- a group of mutually related & cooperating elements;
- having a common goal;
- by taking inputs and producing outputs in a organized manner.
- Information Systems (IS) refers to the interaction between processes and technology.
- System may contain several subsystems with sub goals, all contributing to meet the overall system goal.
- For example, operations, sales and finance and other areas of an organization should all have goals which together help to achieve overall corporate goals.
- In systems, data are used as the input for a process that creates information as an output.

- Five components of a generic system include Input, Process, Output, Feedback and Control.

Answer:
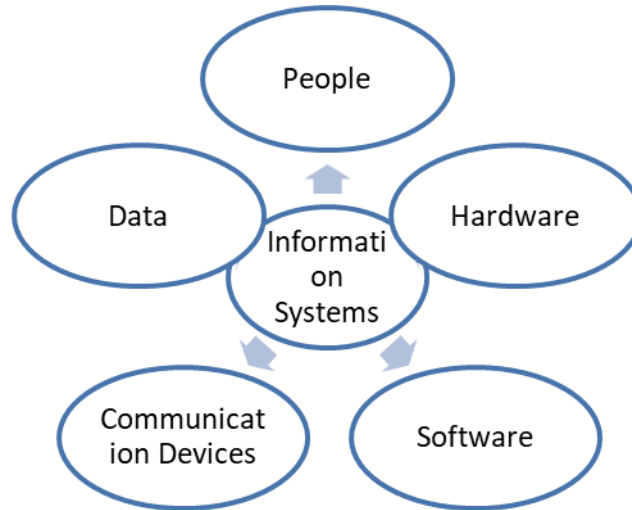
- Information System (IS) is a combination of people, hardware, software, communication devices, network devices and data.
- An Information System model comprises of following steps:
  - Input: Data is entered into system for further processing.
  - Process: A process is a series of steps undertaken to achieve desired outcome or goal.
  - Output: Results of processing i.e. output is used as per requirement.
- Information System aims to support operations, management and decision-making.
- The main objective of Information System is to convert the data into information which is useful and meaningful.
- Information systems help enterprise in decision making and controlling the operations.

Answer: Following are the characteristics of Computer Based Information Systems:

- Information systems are designed and developed with predetermined objectives.
- Information system has several interrelated and interdependent subsystems or components.
- Each subsystem depends on other subsystems for its inputs.
- The way a subsystem works with another subsystem is called interaction. The different subsystems interact with each other to achieve the goal of the system.
- In general, performance of one subsystem or component depends on performance of interrelated component.

Components of Information Systems

Answer: Following are the components of the Information Systems:

People	• People are the most important element in most Computer-based Information Systems. • People include users of the system and Staffs of IT, who manage, run, program, and maintain the system.
Hardware	• Hardware includes the physical components of technology. • Computers, keyboards, hard drives, and flash drives are all examples of Information Systems hardware.
Software	• Software is a set of instructions that tells the hardware what to do. • Software is not tangible i.e. it cannot be touched. • Two main category of software are operating system software and application software.
Data	• Data can be quantitative or qualitative. • Data is processed by Information Systems to arrive at meaningful information.
Network & Communication	• These consist of hardware and software and aids in transfer of data from one physical location to another. • Computers and communications equipment can be connected in networks for sharing voice, data, images, sound and video.

(6) Differentiate between Hardware & Software?

Answer: Following table shows difference between hardware and software:

Hardware	Software
Hardware is tangible portion of the Information Systems.	Software is intangible portion of Information Systems.
Hardware can be operated by using software.	Software can be of two types : Operating System Software and Application Software.
Example of Hardware includes computer, keyboards and hard disks.	Example of Operating System Software includes Microsoft Windows and Linux.
-	Example of Application Software includes Microsoft excel, Microsoft Powerpoint etc.

(7) List down advantages and disadvantages of Application Software?

Answer: Following are the advantages of Application Software:

(1)Addressing User needs: Main advantage of application software is that it addresses exact requirements of the user. Application Software is designed for specific purpose considering user requirements.

(2)Addressing control against virus: Organization using the applications can design appropriate control to protect against virus.

(3)Providing regular updates: Licensed application software gets regular updates from the developer for security reasons. Additionally, developer provides support for system functionality as and when required.

Following are some of the disadvantages of such software as follows:

(1)Costly Development: Specific requirements of the application may make it costly.

(2) Malware Infection: If application software is placed online, it carries a threat of infection by a computer virus or other malicious programs.

(8) What are the areas of applications of Computer based Applications?

Answer: Following are some of the areas of applications of Computer based Applications:

(1)Finance and Accounting:
- This application helps in planning and monitoring financial budget.
- It also helps in forecasting revenues, determining the best resources and uses of funds and managing other financial resources.
- Some sub-applications areas in finance and accounting are financial accounting, asset accounting, cash management, fund management etc.

(2)Marketing and Sales:
- The objective of this application is to maximize the sales and ensure customer satisfaction.
- This application aids in marketing activities, creating new customers and advertising the products.
- The system may also be used to compute commissions for dealers or salesmen and thus helps the corporate managers to take decisions in many crucial areas.

(3)Manufacturing:
- The objective of this application is to support manufacturing activities by optimally deploying man, machine and material to maximize production or service.

- The system generates production schedules and schedules of material requirements, monitors the product quality, plans for replacement or overhauling the machinery and helps in overhead cost control and waste control.

(4)Inventory Management:
- The objective of this application is to keep the track of materials in the stores.
- The system is used to determine the maximum and minimum level of stocks, to give timely alert for re-ordering of materials and to calculate optimal re-order quantity.
- This application also provides important information for production schedule and marketing/sales strategy.

(5)Human Resource Management:
- The objective of this application is to ensure effective and efficient utilisation of human resources.
- This application includes details of qualifications, training, area of expertise, experience etc. which helps management for allocating manpower to right activity.
- An HRM system may have the following modules – personnel administration, recruitment management, travel management, promotion management etc.

(9)What are some of the prominent data base models?

Answer: Following are some of the prominent data base models:

(1) Hierarchical Database Model:
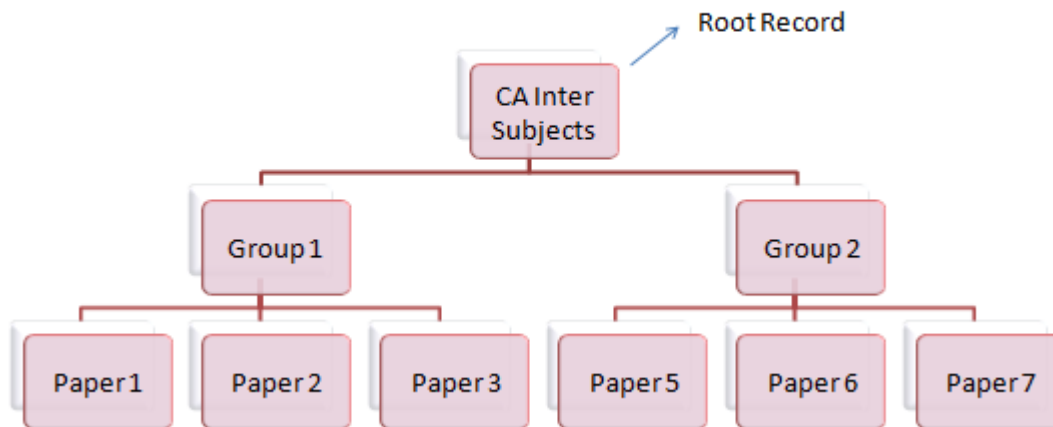
- This model is arranged logically in an inverted tree pattern.
- In this model, records are logically organized into a hierarchy of relationships.
- All records in hierarchy are called Nodes.
- Each node is related to the others in a parent-child relationship. The top parent record in the hierarchy is called the Root Record.
- Each parent record may have one or more child records, but no child record may have more than one parent record.
- Thus, the hierarchical data structure implements one-to-one and one-to-many relationships.

(2) Network Database Model:
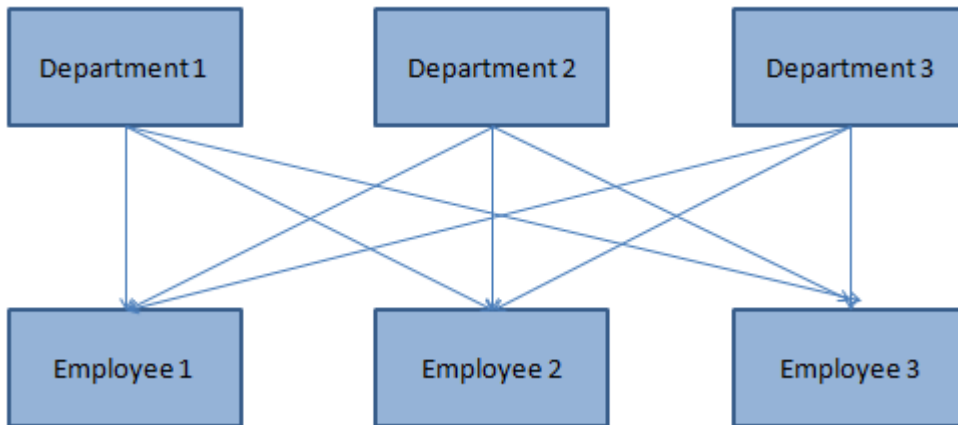
- This model views all records in sets. Each set is made up of an owner record and one or more member records.
- The network model can bring out redundancy in data more efficiently than in the hierarchical model.
- Unlike the hierarchical mode, the network model permits a record to be a member of more than one set at one time. This allows for many-to-one and the many-to- many relationship types.
- Network databases directly address the location of a record on disk. This gives excellent retrieval performance.

(3) Relational Database Model:
- In a relational database, all the tables are related by one or more fields.
- Through this common field, it is possible to connect all the tables in the database.
- For each table, one of the fields is identified as a Primary Key, which is the unique identifier for each record in the table. Primary Key is used to join or combine data from two or more tables.
- Three key terms of this model are Relations, Attributes, and Domains. A relation is a table with columns and rows. Attribute is a named column of the relation and the domain is the set of values the attributes can take.

(4) Object Oriented Database Model:
- An object- oriented database is a set of objects. Each object is an independently functioning application or program, assigned with a specific task to perform.
- OODM is designed to manage all these independent programs to quickly process the large and complex requests.
- An Object-Oriented Database provides a mechanism to store complex data such as images, audio and video, etc.

(10)What are the advantages & disadvantages of DBMS?

Answer: Major advantages of DBMS are given as follows:
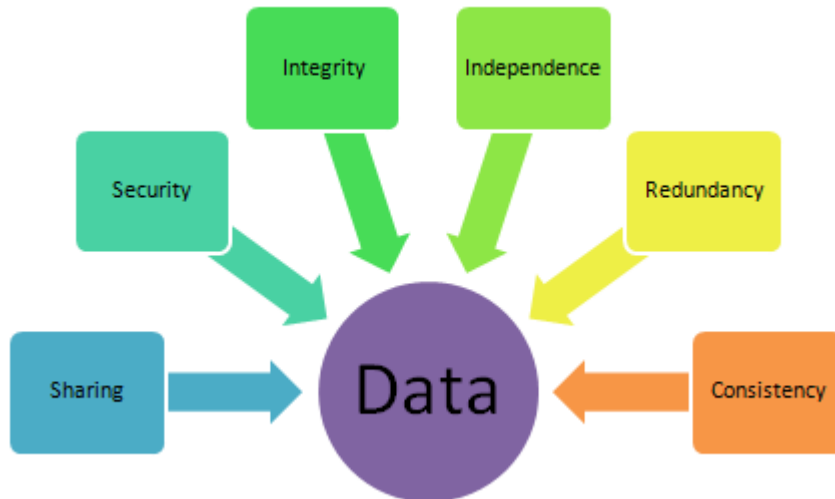
(1)Data Sharing:
- DBMS allows availability of same information to multiple users.

(2)Data Security:
- Rules can be built to give access to sensitive data.
- Using access control techniques like passwords, data access can be restricted to only authorised users.

(3)Data Integrity:
- Single database ensures data integrity by having accurate, consistent, and up-to-date data.
- Any updates or modification to the data must be made in one place in DBMS ensuring Integrity.

(4)Data Independence:
- In a DBMS, data does not reside in applications but databases program & data are independent of each other.

(5)Data Redundancy:
- DBMS reduces data redundancy (duplication) which helps in reducing the cost of data storage and also improves operational efficiency.

(6)Program & File Consistency:
- In DBMS, file formats and programs are standardized and consistent.
- Consistency of files and programs makes it easier to manage data when multiple programmers are involved.

(7)Faster Application Development:
- As data is already there in DBMS, application development becomes fast.
- Application developer has to think of only the logic required to retrieve the data in the way a user needs.

(8)User-friendly:
- DBMS   is user friendly which makes the data access and updation easier for the user.

- DBMS also reduce the reliance on computer experts as normal user can also operate systems with the help of DBMS.

Major disadvantages of DBMS are given as follows:

(1)Cost:
- Cost and time for development of DBMS can be on higher side especially in large enterprises.
- Training requirements for user can also be quite costly.

(2)Security:
- In absence of stringent controls, it may be possible for some unauthorized users to access the database.
- Data security is major challenge in DBMS environment.

(11)What are the benefits of data warehouse?

Answer: Data warehouse is a repository of an organization's electronically stored data. It facilitate reporting and analysis.

Following are the benefits of data warehouse:

Data Warehouse
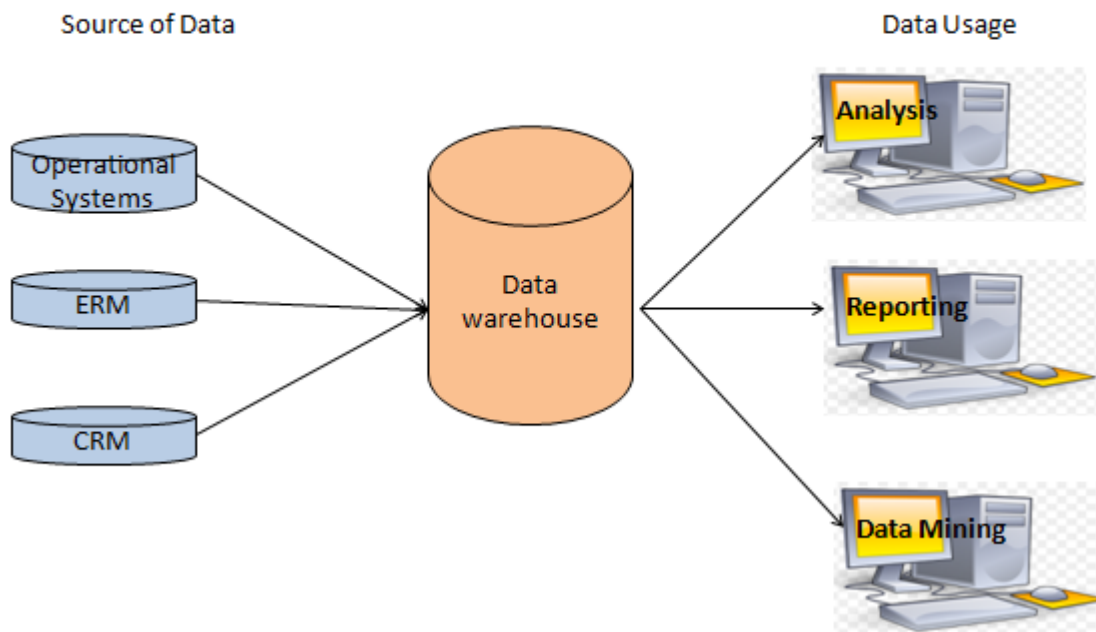
Helps in understanding the data:
- Data warehouse helps an organization to better understand the data that it is currently being collected and, equally important, what data is not being collected.

Centralized View:
- Data warehouse helps in centralized view of all data being collected.

- It also provides a means for determining inconsistent data.

Data Consistency:
- Consistent data helps in generating correct and accurate information
- This is important when the company wants to report consistent statistics such as revenue or number of employees.

Historical Records:
- Data warehouse helps in capturing snapshots of data over time.
- It creates a historical record of data which helps in analysis of trends.

New Information:
- Data warehouse helps in combining various data.
- This provides new information and analysis.

(12)What are the important benefits of computer network?

Answer: Following are some of the important benefits of a computer network:

•Distributed Information
•Resource Sharing
•Computational Power
•Reliability
•User Communication

(1)Distribution of Information:
- Due to geographical spread, information may be required at different location.
- Example: In case of bank, information of various customers is required to be with each branch and also to make Consolidated Balance Sheet, information would be required from all branches at centralised location.

(2)Resource Sharing:
- Networking helps in sharing of resources.
- Data could be stored at a central location and can be shared across different systems.
- Example: In the case of a CBS, bank data is stored at a Central Data Centre and could be accessed by all branches as well as ATMs.

(3)Improved Computational Power:
- Through computer networks, processing is distributed among various computer systems.
- This increases computational power of most of the applications.

- For example: processing in an ATM machine in a bank is distributed between ATM machine and the central Computer System in a Bank, thus reducing load on both.

(4)Reliability:
- Computer network improves reliability of the critical applications.
- Example: In a city, there could be multiple ATM machines so that if one ATM fails, one could withdraw money from another ATM.

(5)User communication:
- Computer Networks allow users to communicate using e-mail, video conferencing etc.

Information Systems' Controls

(13) Identify some of the critical control lacking in a computerized environment?

Answer: Some of the critical control lacking in a computerized environment are as follows:

(1)Lack of management support and understanding of IS risks and related controls.

(2)Lack of awareness and knowledge of IS risks and controls amongst the employees.

(3)Absence or inadequate IS control framework.

(4)Absence or weak general controls and IS controls.

(5)Complexity of implementation of controls in network environments.

(6)Inadequate security functionality in technologies implemented.

Classification of Information System Controls

(14)What are the classifications of Information System's Controls?

Answer: Following are the classifications of Information System's Controls:

Classification on the basis of Objectives of control	Classification on the basis of Nature of IS Resource	Classification on the basis of Audit Functions
•Preventive •Detective •Corrective	•Environmental •Physical •Logical	•Managerial •Application

(1)Classification on the basis of Objectives of Control:

(i)Preventive Controls:
- Preventive Controls are designed to prevent an error, omission or malicious act occurring.
- Some of the examples of preventive controls include employing qualified personnel, segregation of duties, authorization of transaction, firewalls, anti-virus software, passwords etc.

(ii)Detective Controls:

- Detective controls are designed to detect an errors, omissions or malicious acts that occur and report the occurrence.
- Thus detective controls detect errors or incidents that escape preventive controls.
- Some examples of detective control includes bank reconciliation, audits, hash totals, echo control in telecommunications, Intrusion Detection System etc.

(iii)Corrective Controls:
- Corrective controls are designed to correct errors, omissions, or incidents once they have been detected.
- Corrective controls are designed to reduce the impact or correct an error once it has been detected.
- Some examples of corrective controls are a business continuity plan (BCP), contingency planning, backup procedure, rerun etc.

(2)Classification on the basis of Nature of IS Resource:

(i)Environmental Controls:
- Environmental controls are designed to minimize the risk of environmental hazards and exposures.
- These are the controls relating to IT environment such as power, air-conditioning, Uninterrupted Power Supply (UPS), smoke detection, fire-extinguishers, dehumidifiers etc.

(ii)Physical Controls:
- These are the controls relating to physical security of IS resources.
- Physical controls include security guards, access control doors, Security guards, door alarms etc.

(iii)Logical Controls:
- Logical access controls are implemented to ensure that access to systems, data and programs is restricted to authorized users.
- Logical access includes operating systems controls, application software boundary controls, networking controls, access to database objects, encryption controls etc.

(3)Classification on the basis of Audit Functions:

(i)Managerial Controls:
- Managerial controls helps in development, implementation, operation and maintenance of information systems in a planned and controlled manner in an organisation.

(ii)Application Controls:
- The objective of application controls is to ensure that data remains complete, accurate and valid during its input, update and storage.
- Any activity that aims processing accuracy of the application can be considered an application control.
- Application control includes form design, source document controls, input, processing and output controls etc.

(15)List down some of the logical access controls?

Answer: Following are the some of the logical access controls:

User Access Management
- User Registration
- User Password Management
- User Access Rights
- Privilege Management

User Responsibilities
- Password Use
- Unattended User Equipments

Network Access Control
- Network Related (4 points)
- Other (3 points)

Operating System Access Control
- Terminal Related (4 points)
- Access Related (3 points)
- Password Related (2 points)
- Other (2 points)

Application & Monitoring System Access Control
- Access Restriction
- System Isolation
- Event logging
- Monitoring System Use
- Clock Synchronization

Mobile Computing

(1) User Access Management:

(i) User Registration:
- User registration process includes some questions like who has authorized the access, has the data owner approved the access and other relevant aspects.
- The de-registration process is also equally important.

(ii) User password management:
- Passwords management includes allocations, storage, revocation, and reissue of passwords.
- User awareness about password safety is also a critical function.

(iii) Review of user access rights:
- Periodic review of user's need for accessing information is required.
- In case of change of responsibilities, access rights should be provided as per current requirement.

(iv) Privilege management:
- Access to be given solely on the basis of job requirements.
- For example, employee of the operations department should not have access to application development procedure.
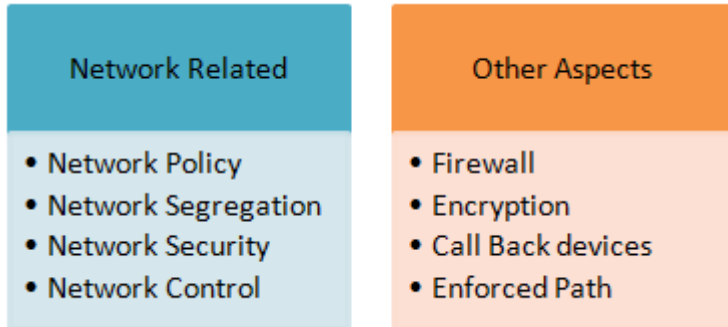
(2) User Responsibilities:

(i) Password use:
- Strong password policy is required to maintain confidentiality.

(ii)Unattended user equipment:
- Users should ensure that all information assets should be secured and protected.
- They should also secure their PCs with a password, and should not leave it accessible to others.

(3)Network Access Control:

Network Related	Other Aspects
• Network Policy • Network Segregation • Network Security • Network Control	• Firewall • Encryption • Call Back devices • Enforced Path

(i)Network Policy:
- Network usage policy applicable to internet service should be available.
- Selection of appropriate services and approval to access them should be part of this policy.

(ii)Network Segregation:
- Based on the sensitive information handling function, internal network (Intranet) should be isolated from external network (internet).

(iii)Network Security:
- The techniques of authentication and authorization policy should be implemented across the organization's network.

(iv)Network connection and routing control:
- The traffic between networks should be restricted based on identification of source and authentication access policies.

(v)Enforced path:
- Based on risk assessment, appropriate network controls should be in place e.g., internet access by employees will be routed through a firewall and proxy.

(vi)Firewall:
- A Firewall is a system that enforces access control between two networks. Firewall rules to be defined to protect the sensitive information.

(vii)Encryption:
- Encryption is the conversion of data into a secret code so no one can read or understand the data.
- Two general approaches are used for encryption viz. private key and public key encryption.

(viii)Call Back Devices:
- The call- back device requires the user to enter a password and then the system disconnects the connection.

- If the caller is authorized, the call back device dials the caller's number to establish a new connection.
- This helps to avoid the call forwarding and man-in-the middle attack

(4)Operating System Access Control:

Operating System is the computer control program. It allows users and their applications to share and access common computer resources, such as processor, main memory, database and printers. Protecting operating system access is extremely crucial and can be achieved using following steps.

Terminal Related	Access Related	Password Related	Other
• Terminal Identifcation • Terminal Log-in • Terminal Time out • Terminal Connection Time	• Access Token • Access Control List • Discretionary Access Control	• Password Management • User Identification & Authentication	• System Utilities • Duress Alarm

(i)Terminal identification:
- This will ensure that only approved terminal can initiate a specified session.

(ii)Terminal log-in procedures:
- A log-in procedure prevents unauthorized access to the system.
- When the user initiates the log-on process by entering user-id and password, the system compares the ID and password to a database of valid users and accordingly authorizes the log-in.

(iii)Terminal time out:
- Control should be implemented to log out the user if the terminal is inactive for a defined period.

(iv)Terminal- Connection time:
- Define the availability of the system. No transactions to be allowed beyond this time. For example, no computer access before or after office hours or on a Saturday or Sunday.

(v) Access Token:
- On successful logon, the operating system creates access token containing key information about the user like user-id, password, user group and rights granted to the user.
- This will help to control actions performed by user.

(vi)Access Control List:
- Access Control list contains details about access rights available with all users.
- When a user attempts to access a resource, the system compasses his or her user-id and privileges contained in the access token with those contained in the access control list. Access is granted only to authorised users.

(vii)Discretionary Access Control:
- In distributed systems, resources may be controlled by the end-user.
- Resource owners grant access privileges to other users.
- For example, the controller who is owner of the general ledger grants read only privilege to the marketing department while collection manager is granted both read and write permission to the ledger.

(viii)Password management system:
- An operating system could enforce selection of strong password.
- Password file should be properly controlled and should not be accessible to users.

(ix)User identification and authentication:
- For user authentication, stringent methods like Biometric Authentication or Cryptographic means like Digital Certificates should be employed.

(x)Use of system utilities:
- System utilities are the programs that help to manage critical functions of the operating system e.g. addition or deletion of users.
- Use and access to these utilities should be strictly controlled and logged.

(xi)Duress alarm to safeguard users:
- If users are forced to execute some instruction under threat, the system should provide a means to alert the authorities.

(5)Application and Monitoring System Access Control:

(i)Information access restriction:
- Only authorised person should have access to data or applications.
- Controls are implemented on the access rights of users. For example - read, write, delete, and execute.

(ii)Sensitive system isolation:
- Sensitive systems should be placed in an isolated environment.

(iii)Event logging:
- All system access should be recorded in a transaction log.
- The log should be reviewed at regular interval.

(iv)Monitor system use:
- Constant monitoring of critical systems is essential.
- Details about transactions to be monitored should be clearly defined.

(v)Clock synchronization:
- It is to be ensured that clock timing should be synchronized for all the devices in the network. This will help in analyzing the events.

(6)Mobile Computing:
- Mobile devices carry high risk of data theft. It is important to have both physical and logical access to these systems.

- Information is to be encrypted and access identifications like fingerprint, eye-iris, and smart cards are necessary security features.

(16) Discuss three levels of input validation controls?

Answer: Following are the three levels of input validation controls:

Field Interrogation	Record Interrogation	Record Interrogation
• Limit Check • Picture Check • Valid Code Check • Check Digit • Arithmetic Check • Cross Check	• Reasonableness Check • Valid Sign Check • Sequence Check	• Version Usage • Labelling • Data File Security • Before & After Image • File Authorisation • Parity Check

(1)Field Interrogation: It examines the characters of the data in the field. Some common types of field interrogation are as follow:

Checks	Particulars
Limit Check	In this check, predefined limits are set for input/output transactions. The field is checked by the program against predefined limits to prevent any errors.
Picture Check	Picture checks prevent processing of incorrect/ invalid characters.
Valid Code Check	In this check, predetermined codes are set to ensure that input data are valid. The predetermined codes or tables may either be embedded in the programs or stored in files.
Check Digit	A check digit is an extra digit added to the code to verify the integrity of the code during subsequent processing. The check digit can be located anywhere in the code, as a prefix, a suffix, or embedded someplace in the middle.
Arithmetic Check	In this check, arithmetic calculation is performed in different ways to validate the result. Example: Discount can be calculated in following two ways for Rs. 1000/- at 5% discount. (i) $1,000 - 1,000 \times 5/100 = 950$ or Next time again at (ii)(950/(100-5))*100.
Cross Check	This check is employed to cross verify fields appearing in different files to see that the result tally.

(2) Record Interrogation: Some record interrogations are discussed as follow:

Checks	Particulars
Reasonableness Check	This check helps to ensure that whether the value specified in a field is reasonable for that particular field.
Valid Sign	This check helps to determine valid sign for a numeric field.
Sequence Check	This check helps to ensure that physical records follow a required order matching with logical records.

(3) File Interrogation: Some file interrogations are discussed as below:

Checks	Particulars
Version Usage	Version control helps to ensure that only the most current file be processed.
Labelling	Internal & external labelling of storage media is important to ensure that the proper files are loaded for process. External labelling is important in case of manual processing and internal labelling is important in case of automated tape loader system.
Data File Security	These controls ensure prevention of unauthorized access to ensure its confidentiality, integrity and availability.
Before and after Image and Logging	This control captures images of before transaction and after transactions. This helps in re-constructing the data file back to its last state of integrity, in case if any file is damaged or corrupted.
File updating and maintenance Authorisation	Appropriate controls should be built for file updating and maintenance to ensure that stored data are protected.
Parity Check	Parity check helps in detecting and correcting transmission errors.

(17) Discuss some of the output controls?

Answer: Output Controls ensure that the confidentiality and integrity of the output is maintained and that the output is consistent. Various Output Controls are as follows:

(1) Storage of critical forms:
- Pre-printed forms should be stored in a secured environment.
- Only authorized persons should be allowed access to sensitive stationery supplies such as security forms, negotiable instruments, etc.

(2) Logging of output program executions:
- Proper logging and monitoring of output program should be done. Otherwise confidentiality/integrity of the data may be compromised.

(3) Spooling/Queuing:
- Spool (Simultaneous Peripherals Operations Online) is a process used to ensure that the user can continue working, while the print operation is in process.
- In spool environment, intermediate storage of output could lead to unauthorized access.
- Proper control should be place for such operations.

(4) Controls over printing:
- Proper control to be placed for printing.

- Access restrictions may be placed on the workstations that can be used for printing.
- User training is also important for usage of printer.

(5) Report Distribution and Collection Controls:
- Report should be distributed in a secured environment.
- A log should be maintained for reports that were generated and to whom these were distributed.

(6) Retention Controls:
- Retention control requires that a date should be determined for each output item produced.
- Retention period depends on the need of the output, use of the output, legislative requirements etc.

(18) List down various phases and their controls during program development life cycle? (May 19)

Answer:

| Phase	Controls
Planning	Control techniques like Gantt Charts, PERT, Work Breakdown Structures (WBS), can be used to monitor progress against plan.
Control	The Control phase has two major purposes: • To monitor progress against planned schedule. • To implement control to ensure software released for production use is authentic, accurate, and complete.
Design	To implement systematic approach to program design (such as any of the structured design approaches or object-oriented design)
Coding	To implement systematic approach to coding (like Top-down, Bottom-up and Threads approach)
Testing	To implement following testing: • Unit Testing: which focuses on individual program modules; • Integration Testing: which focuses in groups of program modules; and • Whole-of-Program Testing: which focuses on whole program.
Operation and Maintenance	To implement following maintenance: • Repair Maintenance – in which program errors are corrected; • Adaptive Maintenance – in which the program is modified to meet changing user requirements; and • Perfective Maintenance - in which the program is tuned to decrease the resource consumption.

Information Systems Auditing

Answer: Following are some of the factors influencing need for audit of Information Systems:

Factors	Particulars
Cost of Data Loss	Due to various regulations, cost of data lost is very high. Data is a critical resource of an organization and it should be protected.
Cost of Incorrect Decision Making	Data accuracy is very important to make quality decisions. Incorrect data may impact operational efficiency of the organization.
Cost of Computer Abuse	Unauthorized access to computer systems may impact confidentiality, integrity and availability (CIA) of the systems.
Cost of Computer Error	Data error may have huge impact in a computerized environment where many critical business processes are performed.
Value of Computer Infrastructure	Computer infrastructure includes hardware, software and personnel. These are critical resources of an organization which is to be protected.
Value of Privacy	Maintenance of privacy of data of customers is very critical in today's world.
Controlled evolution of computer use	Consequences of using unreliable systems can be destructive.

(20)Discuss different types of continues audit techniques?

Answer: Following are some of the types of continuous audit techniques:
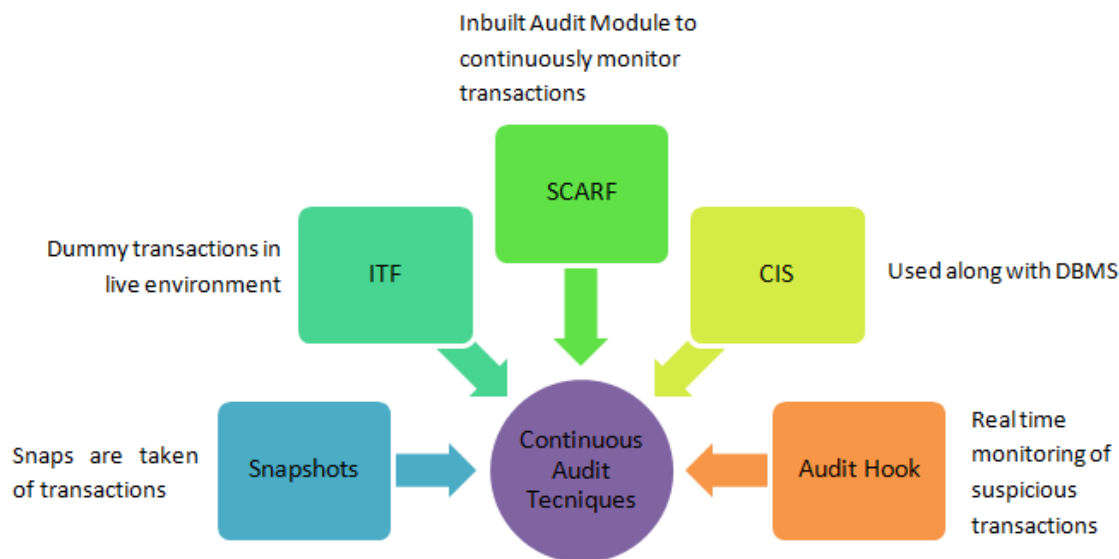
(1)Snapshots:

- In this technique, snaps (pictures) are taken of the transactions as transaction moves through various stages in the application system.
- Both before -processing and after -processing images of the transactions are captured.
- Auditor can verify the correctness of the processing by checking before-processing and after-processing images of the transactions.
- In this technique, three important considerations are (i)location where snaps to be taken (ii)time of capturing snaps and (iii) reporting of snapshot data captured.

(2)Integrated Test Facility (ITF):
- In ITF, dummy transactions are used in live environment.
- Auditor can enter dummy or test transactions and verify the processing and results of these transactions for correctness.
- Example: A dummy asset of Rs. 100000/- is entered into system to verify whether same is being capitalized under correct head and depreciation is calculated properly as per correct rate. Subsequently this dummy transaction is removed after verification of system controls.
- In such cases the auditor must decide what would be the method to be used to enter test data and the methodology for removal of the effects of the ITF transactions.

(3)System Control Audit Review File (SCARF):
- SCARF stands for System Control Audit Review File.
- In this technique an embedded (inbuilt) audit module is used to continuously monitor transactions.
- This technique is used to collect data for special audit purpose.
- Auditors then examine the information contained on this file to see if some aspect of the application system needs follow-up.
- In many ways, the SCARF technique is like the snapshot technique along with other data collection capabilities.

(4)Continuous and Intermittent Simulation (CIS):
- This technique is variation of SCARF technique.
- This technique can be used whenever the application system uses the database management system (DBMS).
- DBMS reads the transaction which is passed to CIS. If transaction is as per selected criteria, then CIS examines the transaction for correctness.
- CIS determines whether any discrepancies exist between the results it produces and those the application system produces.
- Such discrepancies are written to exception log file.
- Thus, CIS replicates or simulates the application system processing.
- Advantage of CIS is that it does not require modification to application system and yet provides online auditing capacity.

(5)Audit Hooks:
- When audit hooks are employed, auditors can be informed of suspicious transactions as soon as they occur.
- This approach of real-time notification displays a message on the auditor's terminal.

- Criteria for suspicious transactions are designed by auditors as per their requirement.
- For example, internal auditors at Insurance Company determined that their policyholder system was vulnerable to fraud every time a policyholder changed his or her name or address and then subsequently withdrew funds from the policy. They devised a system of audit hooks to capture such suspicious transactions.

Audit Trail

(21)What are the objectives of Audit Trail?

Answer: Audit trails can be used to support security objectives in three ways:

Objectives of Audit Trail:

To detect unauthorized access

To reconstruct events

To establish accountability

Detecting Unauthorized Access:
- Audit trail helps in detecting unauthorized and thus help to protect the system from outsiders who are attempting to breach system controls.
- A real-time audit trail can also be used to report a virus or worm.
- However, higher the level audit trail and real-time detection can increase expenditure on the operating system and also degrade (slow downs) operational performance.

Reconstructing Events:
- Audit trail helps to reconstruct the steps that led to events such as system failures or application processing errors.
- This knowledge can be used to assign responsibility and to avoid similar situations in the future.

Personal Accountability:
- Audit trails helps in monitoring user activity.
- This prevents user to do any unauthorised activities.

(22) Discuss the key activities, which require special attention for auditing the user access provisioning. (May 19)

Answer: Following special attention for auditing the user access provisioning is required:
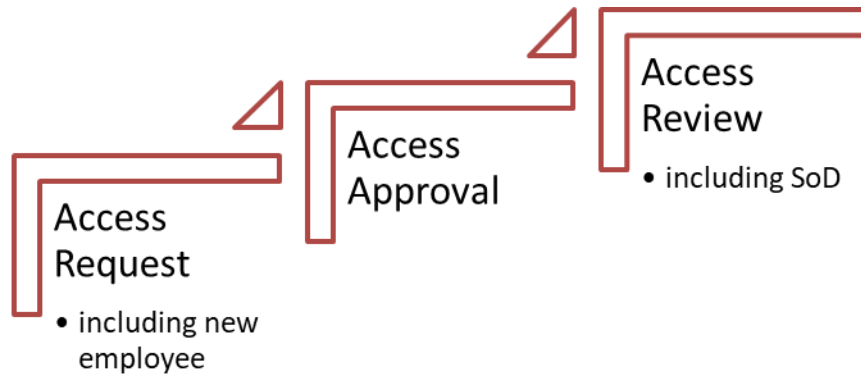
(i)Process for Access Request: The IS auditor should verify process of access request and determine if these processes are used consistently throughout the organization.

(ii)Process for New employee provisioning: The IS auditor should verify how a new employee's user accounts are initially set up. The auditor should determine if manager's authorization is obtained.

(iii)Process for Access approvals: The IS auditor needs to verify process for approval and by what authority they are approved.

(iv)Periodic Access reviews: The IS auditor should determine if periodic reviews are performed for access provided. This may include termination reviews, internal transfer reviews, SOD reviews, and dormant account reviews.

(v)Segregation of Duties (SOD): The IS auditor should determine whether proper segregation of duties exists.

Organization Structures & Responsibilities

(23)Define Roles & Responsibilities of various titles in Information Technology?

Answer: Following table depicts roles and responsibilities of various titles in IT:

Executive Management	
Title	**Responsibilities**
Chief Information Officer (CIO)	Top most leader in a larger IT organization.
Chief Technical Officer (CTO)	Responsible for an organization's overall technology strategy.
Chief Security Officer (CSO)	Responsible for all aspects of security, (information security, physical security and safety of senior executives).
Chief Information Security Officer (CISO)	Responsible for all aspects of data-related security. This usually includes incident management, disaster recovery, vulnerability management, and compliance.
Chief Privacy Officer (CPO)	Responsible for the protection and use of personal information. This position is found in organizations that collect and store sensitive information for large numbers of persons.

Software Development	
Title	Responsibilities
Systems Architect	Responsible for the overall information systems architecture in the organization.
Systems Analyst	Responsible for design of applications, including changes in an application's original design. This position may develop technical requirements, program design, and software test plans. In cases where organizations license applications developed by other companies, systems analysts design interfaces to other applications.
System Developer/System Programmer	This position develops application software. In organizations that utilize purchased application software, developers often create custom interfaces, application customizations, and custom reports.
Software Tester	Responsible for testing changes in programs made by software developers.

Data Management	
Title	Responsibilities
Database Architect	Responsible for developing logical and physical designs of data models for applications. Position also designs an organization's overall data architecture.
Database Administrator (DBA)	Responsible to build and maintain databases The DBA monitors databases, tunes them for performance and efficiency, and troubleshoots problems.
Database Analyst	Responsible for tasks that are junior to the database administrator, carrying out routine data maintenance and monitoring tasks.

Network Management	
Title	Responsibilities
Network Architect	This position designs data and voice networks and designs changes and upgrades to the network as needed to meet new organization objectives.
Network Engineer	Responsible to build and maintain network devices such as routers, switches, firewalls, and gateways.
Network Administrator	Responsible for routine tasks in the network such as making minor configuration changes and monitoring event logs.
Telecom Engineer	Responsible for telecommunications related work.

General Operations	
Title	Responsibilities
Operations Manager	Responsible for overall operations that are carried out by others. Responsibilities will include establishing operations shift schedules.
Operations Analyst	Responsible for the development of operational procedures, examining the health of networks, systems, and databases and maintaining operations records.
Control Analyst	Responsible for monitoring batch jobs, data entry work, and other tasks to make sure that they are operating correctly.
Systems Operator	Responsible for monitoring systems and networks, performing backup tasks, running batch jobs, printing reports, and other operational tasks.
Data Entry	Responsible for keying batches of data from hard copy sources.
Media Library	Responsible for maintaining and tracking the use and whereabouts of backup tapes and other media.

Security Operations	
Title	**Responsibilities**
Security Architect	Responsible for the design of security controls and systems such as authentication, audit logging, intrusion detection systems, intrusion prevention systems, and firewalls.
Security Engineer	Responsible for designing, building, and maintaining security services and systems that are designed by the security architect.
Security Analyst	Responsible for examining logs from firewalls, intrusion detection systems, and audit logs from systems and applications. This position may also be responsible for issuing security advisories to others in IT.
User Account Management	Responsible for accepting approved requests for user access management changes and performing the necessary changes at the network, system, database, or application level.
Security Auditor	Responsible for performing internal audits of IT controls to ensure that they are being operated properly.

Service Desk	
Title	**Responsibilities**
Help Desk Analyst	Responsible for providing front line support services to users.
Technical Support Analyst	Responsible for providing technical support services to other IT personnel, and also to IT customers.

Segregation of Duties

(24)Give examples of Segregation of Duties Controls?

Answer: Following are some of the examples of segregation of duties:

(1)Transaction Authorization:
- Maker-checker concept requires two (or more) persons to approve certain transactions.
- In IT applications, transactions meeting certain criteria (exceeding normally accepted limits or conditions) may require a manager's approval to be able to proceed.

(2)Split custody of high-value assets:
- High value assets can be protected using various means of split custody.
- Banks do this for central vaults, where a vault combination is split into two or more pieces so that two or more are required to open it.
- Similarly, for critical applications, two or more passwords (available with different individuals) to be required for access.

(3)Workflow:
- In workflow type systems, extra management approval is required for administrative privileges.

(4)Periodic reviews:
- Periodic review is required to identify whether any segregation of duties issues exist.
- The access privileges for each worker can be compared against a segregation of duties control matrix.

MCQ Type Questions

(1)Which of the following is not a characteristic of a System?
(a)System compromises of mutually related & cooperating elements.
(b)System may contain several subsystems with sub goals, all contributing to meeting the overall system goal.
(c)Five components of a generic system include Input, Process, Output, Feedback and Control.
(d)In systems, information is used as the input for a process that creates data as an output.

(2)Which of the following is not a characteristic of a Information System?
(a)Information System aims to increase cost of operations.
(b)The main objective of Information System is to convert the data into information which is useful and meaningful.
(c)Information system model highlights the relationships among the components and activities of information systems.
(d)Information systems help enterprise in decision making and controlling the operations.

(3)Identify the one which is not a component of Information Systems:
(a) Data
(b) Computer Network
(c) People
(d) Transaction Processing System

(4)Identify the one which is not a functional unit of Central Processing Unit (CPU):
(a)Output devices
(b)Arithmetic and Logic Unit
(c)Registers
(d)Control Unit

(5)Which of the following is correct full form of RAM?
(a)Random Access Memorandum
(b)Random Access Memory
(c)Read Accessible Memory
(d)Read Authorization Memory

(6)Identify the term which is not used in Relational Database Models:
(a)Domain
(b)Relations
(c)Objects
(d)Attributes

(7)Which of the following is not an example of commercial available DBMS?
(a)Oracle
(b)Java
(c)My SQL
(d)SQL Servers

(8)What is the full form of VoIP?
(a)Valid Internet Protocol

(b)Voice Over Internet Protocol
(c)Voice Over Internet Price
(d)Voice Over Internet Performance

(9)Which of the following is not one of the controls lacking in a computerised environment?
(a)Lack of management support and understanding of IS risks and related controls.
(b)Lack of awareness and knowledge of IS risks and controls amongst the employees.
(c)Absence or inadequate IS control framework.
(d)Ease of implementation of controls in network environments.

(10)Identify the control which is not corrective in nature:
(a)Hash Totals
(b)Business Continuity Plan
(c)Rerun Procedure
(d)Backup Procedure

(11)Which of the following is the process of conversion of data into a cipher text for storage in databases and transmission over networks?
(a)Networking
(b)Decryption
(c)Encryption
(d)Logging

(12)Which of the following is the process of re-conversion of cipher text into plain text?
(a)Networking
(b)Decryption
(c) Encryption
(d)Logging

(13)Which of the following error occurs when a digit or character is removed?
(a) Addition Error
(b) Transposition Error
(c) Substitution Error
(d)Truncation Error

(14)Which of the following error occurs when an extra digit or character is added to the code?
(a)Transposition Error
(b)Substitution Error
(c)Addition Error
(d)Truncation Error

(15)Which of the following error occurs when one digit is replaced with another digit?
(a)Transposition Error
(b)Substitution Error
(c)Addition Error
(d)Truncation Error

(16)Which of the following error occurs when two digits are reversed?
(a)Transposition Error

(b)Substitution Error
(c)Addition Error
(d)Truncation Error

(17)Which of the following refers to the ability of a network to recover from any kind of error like connection failure, loss of data etc.?
(a)Bandwidth
(b)Resilience
(c)Contention
(d)Routing

(18)Which of the following refers to the amount of data which can be sent across a network in given time?
(a)Bandwidth
(b)Resilience
(c)Contention
(d) Routing

(19)Which of the following refers to the process of deciding on how to communicate the data from source to destination in a network?
(a)Bandwidth
(b)Resilience
(c)Contention
(d) Routing

(20)Which of the following refers to the situation that arises when there is a conflict for some common resource in a network?
(a)Bandwidth
(b)Resilience
(c)Contention
(d) Routing

(21)Which of the following application controls, maintains the chronology of events that occur when a user attempts to gain access to and employ systems resources?
(a)Boundary Controls
(b)Input Controls
(c)Communication Controls
(d)Processing Controls

(22)Which of the following application controls maintains the chronology of events that occur either to the database definition or the database itself?
(a)Boundary Controls
(b)Input Controls
(c)Database Controls
(d)Processing Controls

(23)Which of the following application controls, maintains the chronology of events from the time data and instructions are captured and entered into an application system until the time they are deemed valid and passed onto other subsystems within the application system ?

(a)Boundary Controls
(b)Input Controls
(c)Database Controls
(d)Processing Controls

(24)Which of the following application controls, maintains a chronology of the events from the time a sender dispatches a message to the time a receiver obtains the message?
(a)Boundary Controls
(b)Input Controls
(c)Database Controls
(d)Communication Controls

(25)Which of the following technique involves embedding audit software modules within a host application system to provide continuous monitoring of the system's transactions?
(a)Audit hooks
(b) SCARF
(c)Integrated Test Facility (ITF)
(d)Continuous and Intermittent Simulation (CIS)

(26)What is the full form of CIS?
(a)Common Integrated System
(b)Common Integrated Simulation
(c)Continuous and Integrated System
(d)Continuous and Intermittent Simulation

(27) In which technique, picture are taken of the transactions as transaction moves through various stages in the application system?
(a)Audit hooks
(b)Snapshots
(c)Integrated Test Facility (ITF)
(d)Continuous and Intermittent Simulation (CIS)

(28)Which of the following technique can be used whenever the application system uses the database management system (DBMS)?
(a)Audit hooks
(b)SCARF
(c)Integrated Test Facility (ITF)
(d)Continuous and Intermittent Simulation (CIS)

(29)In which of the following technique, auditor enters dummy or test transactions and verify the processing and results of these transactions for correctness?
(a)Audit hooks
(b)SCARF
(c)Integrated Test Facility (ITF)
(d)Continuous and Intermittent Simulation (CIS)

(30)What is the full form of SCARF?
(a)System Control Audit Review File
(b)System Consideration for Audit Review File

(c)System Control Audit Report File
(d)System Control Audit Review Format

(31)Which of the following is not an objective of audit trail?
(a)To reconstruct events
(b)To monitor user activities
(c)To detect unauthorized access
(d)To improve system performance

(32)Who among the following is top most leader in a larger IT organization?
(a)Chief Information Officer (CIO)
(b)Chief Technical Officer (CTO)
(c)Chief Information Security Officer (CISO)
(d)Chief Privacy Officer (CPO)

(33)Who among the following is responsible for organization's overall technology strategy?
(a)Chief Security Officer (CSO)
(b)Chief Technical Officer (CTO)
(c)Chief Information Security Officer (CISO)
(d)Chief Privacy Officer (CPO)

(34)Who among the following is responsible for the overall information systems architecture in the organization?
(a)Systems Architect
(b)Systems Analyst
(c)System Developer
(d)System Programmer

(35)Who among the following is responsible for developing logical and physical designs of data models for applications and also designs an organization's overall data architecture?
(a)Systems Architect
(b)Database Architect
(c)Database Administrator
(d)System Programmer

(36)Who among the following is responsible for designing data and voice networks and designs changes and upgrades to the network as needed to meet new organization objectives?
(a)Systems Architect
(b)Database Architect
(c)Database Administrator
(d)Network Architect

(37)Which of the following is not a segregation of duties control?
(a)Transaction Authorization
(b)Split custody of high value assets
(c)Workflow
(d)Statutory Audit

(38) Which of the following is a data entry error when two digits that were either individual or part of larger sequence of numbers were reversed when posting a transaction?
(a)addition Error
(b)Truncation Error
(c)Substitution Error
(d)Transposition Error

(39) Which of the following controls will not fall under the purview of Input Controls?
(a)Source Document Controls
(b)Data Coding Controls
(c)Boundary Controls
(d)Batch Controls

(40) Which type of controls can be exercised by the IT Team in case of existence of numerous accounts numbers of inactive accounts in their usage data of active customers?
(a)Corrective Controls
(b)Detective Controls
(c)Preventive Controls
(d)Compensatory Controls

(41) Which of the following controls are designed to prevent unauthorized individual from viewing, retrieving, computing or destroying the entity's data in any organization?
(a)Access
(b)Backup
(c)Concurrency
(d)Quality

(42) Technique of Cryptography does not involve:
(a)Transposition
(b)Substitution
(c)Product Cipher
(d)Transcription

(43) Which one is not a correct statement?
(a)In Relational Database model, the named columns of the relation are called Domain.
(b)In Relational Database model, a Relation is a table with rows and columns
(c)In Relational Database model, the named columns of the relation are called Attributes.
(d)In Relational Database model, the Domain is the set of the values an attribute can take.

(44) Which of the following is not a type of Data Resource Management Controls under Managerial Controls?
(a)Existence Control
(b)Concurrency Controls
(c)Production Controls
(d)Quality Controls

(45) Which of the following does not fit into best practices while dealing with passwords in order to avoid system failures?
(a)Periodic change of passwords

(b)Unlimited number of entry attempts
(c)Minimum password length
(d)Hashing of passwords

(46) Which risk refers to the data lost from stolen or lost devices in case of BYOD?
(a)Financial Risk
(b)Application Risk
(c)Device Risk
(d)Integration Risk

(47) Which control is not verified during audit of Environmental Controls?
(a)Power Backup
(b)Water Detection
(c)Fire detection and Suppression
(d)Guards and Dogs

(48) Which control is not verified during audit of logical access control?
(a)Access Controls
(b)Intrusion Detection and Prevention
(c)Backup Power
(d)password management

(49) A Business Continuity Plan (BCP) is which type of control:
(a)Deterrent Control
(b)Application Control
(c)Preventive Control
(d)Corrective Control

(50) Which of following is not a threat:
(a)malware
(b)virus
(c)Worm
(d)Firewall

(51) Which of the following risk is not applicable when it adopts Bring Your Own Device (BYOD)?
(a)Availability Risk
(b)Confidentiality Risk
(c)Integrity Risk
(d)Implementation Risk

(52) Which of the following is allowed in Database Management Systems (DBMS)?
(a)Deleting the file
(b)Modifying existing files
(c)Retrieving or deleting data from existing files
(d)Duplicating Files

(53) Database Model with inverted tree like structure:
(a)Hierarchical Database Model
(b)Relational Database Model

(c)Network Database Model
(d)Object oriented Database Model

(54) In case of conflict for some common resource, computer resource has capacity to recover. This is known as:
(a)Routing
(b)Bandwidth
(c)Resilience
(d)Contention

(55) Audit technique to identify suspicious transactions is known as:
(a)Continuous and Intermittent Simulation(CIS)
(b)System Control Audit Review File (SCARF)
(c)Audit Hook
(d)Integrated Test Facility (ITF)

(56) While defining RISK, the person is not likely to refer to which terms in its definition.
(a)Vulnerability
(b)Threats
(c)Impact
(d)Asset

(57) Inadequate Security is known as:
(a)Vulnerability
(b)Threats
(c)Risk
(d)Impact

Answer to MCQs (Chapter-3)

Question No.	Answer Key	Question No.	Answer Key
1	d	31	d
2	a	32	a
3	d	33	b
4	a	34	a
5	b	35	b
6	c	36	d
7	b	37	d
8	b	38	d
9	d	39	c
10	a	40	b
11	c	41	a
12	b	42	d

13	d	43	a
14	c	44	b
15	b	45	c
16	a	46	c
17	b	47	d
18	a	48	c
19	d	49	d
20	c	50	d
21	a	51	a
22	c	52	d
23	b	53	a
24	d	54	d
25	b	55	c
26	b	56	c
27	b	57	a
28	d	-	-
29	c	-	-
30	a	-	-

Chapter 4 - E-Commerce, M-Commerce and Emerging Technologies

This chapter deals with various provisions and aspects of E-commence, M-Commerce and Emerging Technologies and covers following important topics:

- Introduction to E-Commerce
- Components of E-Commerce
- Architecture of Network System
- Work Flow Diagram for E-Commerce
- Risks & Controls for E-Commerce
- Guidelines of Laws governing E-Commerce
- Digital Payment
- Computing Technologies
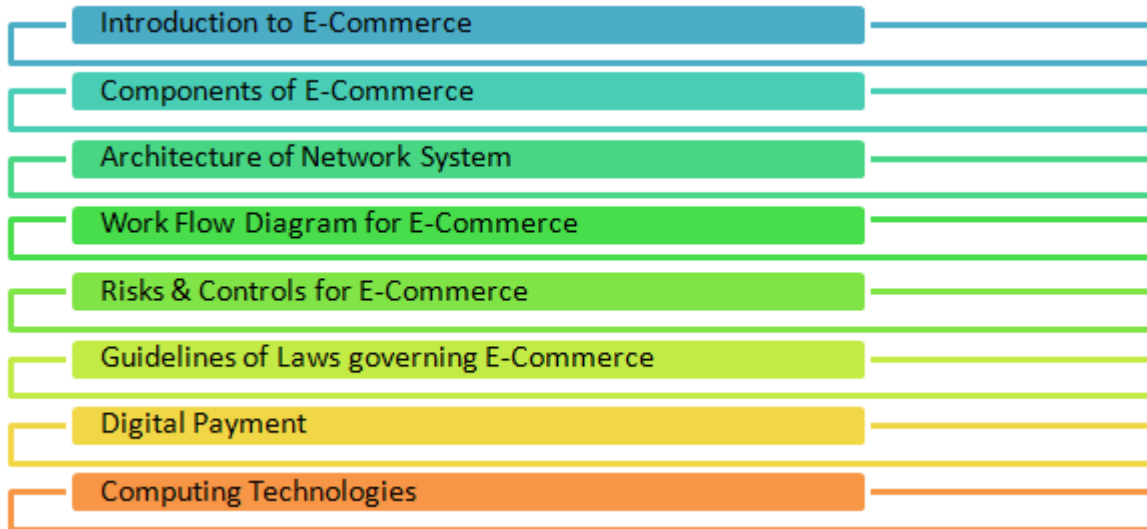
Introduction to E-Commerce

(1) Differentiate between traditional commerce and e-commerce.

Answer: Following table shows difference between traditional commerce and e-commerce:

Feature	Traditional commerce	E-commerce
Definition	Traditional commerce focuses on the exchange of products and services through personal interactions	E-commerce focuses on the exchange of goods and services via the Internet
Availability	Limited Availability	Can be accessed anytime 24/7
Scope of Business	Geographically limited.	Global business scope.
Delivery of Goods	Instant	Time-consuming
Transaction Processing	Manual	Automatic
Physical Inspection	Goods can be inspected before purchase.	Cannot be inspected before purchase.
Mode of Payment	Cash, Card Payment, Cheques	Card Payment, Wire Transfer,
Marketing	One to Many marketing	One to One Marketing possible
Resource Focus	Supply Side	Demand Side
Profit Impact and Layers of Delivery	Involved multiple layers in selling and hence reduced profit margin	Reduced layers in selling and hence increased profit margin

(2)What are the benefits of E-Business?

Answer: Following are the benefits of E-Business:

(1)Benefits to User:

Benefits	Description
Convenience	For many people in the world, e-Commerce becomes one of the preferred ways of shopping as they enjoy their online because of its easiness and convenience. They are allowed to buy products
Time Saving	E-commerce saves time for the users.
Multiple Options	Customer can choose from variety of options and can compare with similar products including price in a click of mouse button, which is not possible in physical store.
Reviews	Reviews are easily available about a particular site or product from the previous customers which provides valuable feedback.
Coupon & Deals	Discount coupons and reward points are available for customers to encourage online transaction.
Anytime Access	E-commerce platform is available all the time.

(2)Benefits to Seller:

Benefits	Description
Increased Customer Base	E-Commerce business provides an opportunity to reach more and new customers.
Reduction in Cost	Creating & managing an online store is much more cost effective in comparison to a physical store as it optimizes the cost of land, rent, water, electricity etc.
Instant Transactions	The transactions of e-commerce are based on real time processes. This improves overall business cycle.
Dynamic Market	Since there are several players and very high competition, E-commerce provides a dynamic market which improves quality and business.
Increase in Efficiency	Efficiency improves due to faster transactions, automation and better inventory management.
Easier Entry into new markets	Online stores are not restricted to geographical boundaries like a physical store and so it gives a platform to sell products & services across the globe and target customers without any location limit & restriction.

(3)Benefits to Government:

Benefits	Description
Reducing Corruption	Transactions improve transparency and reduce corruption.
Reduction in use of ecologically damaging materials	Electronic transactions reduce the use of ecologically damaging materials.

(3)What are the components of E-Commerce?

Answer: Following are the six components of E-Commerce:

Components	Description
Users	In the context of E-commerce, a User means any person or organization who is buying goods or services. User can choose a product from variety of options, user can compare with similar products and order selected product in a click of mouse button.
E-commerce Vendor	This is the organization or entity which is selling the products or services in the e-commerce transaction. E-commerce Vendor needs to ensure following for effective and efficient transactions: • Supply Chain Management & Warehouse facility • Shipping & Return procedures • Catalogue • Showroom & offline purchase • Marketing & Loyalty programs • Guarantee/Warranty Program • Policy & Security
Technology Infrastructure	Technology Infrastructure includes: Computer, Servers and database Mobile Application: Mobile application includes mobile store front end module and mobile ticketing module. Digital library: Digital library is used to store digital objects like images, video, sounds etc.) Data interchange: DI is also known as Electronic Data Interchange (EDI). EDI helps in electronic transfer of data from one computer to another.
Internet	Faster the internet connectivity leads to better and smoother E-commerce transactions. In current scenario, the internet connectivity can be traditional (liked fixed line) or advanced wireless networks (like 4G or 5G).
Web Browser	Web browser is an application through which user interacts with e-commerce vendor.
Payment Gateway	The payment gateway acts as intermediary between vendor and buyer's bank for the payment processing and confirms vendor about the receipt of payment.

(4) In a e-business environment, controls are required to put in place at each participant's level. Discuss about the participants involved in any e business environment?

Answer:

Participants	Details
User	• Only genuine user should be allowed to use the e-commerce/ m-commerce platform. • There is risk if user accounts are hacked and hackers buy products / services.
Seller/Buyer/Merchant	• They should have proper control and framework in place for success of e-commerce. • Controls are required on product catalogues, price catalogues, discounts, cash on deliveries etc.
Government	Government have concerns about: • Tax accounting of all products / services sold. • All products / services sold are legal.
Network Service Provider	• They need to ensure availability and security of network.
Technology Service Provider	• These include all other service provider such as cloud computing back-ends, applications back-ends etc. • They are also prone to risk of availability and security.
Logistics Service Provider	• Logistics service providers are responsible for timely product

	deliveries.
Payment Gateway	• Payment gateways should be efficient, effective and fool-proof.

Architecture of Network Systems

Detailed book available at following link:

https://notionpress.com/read/enterprise-information-system