PAPER – 7: INFORMATION TECHNOLOGY AND STRATEGIC MANAGEMENT

SECTION – A: INFORMATION TECHNOLOGY

QUESTIONS

1. Define the following terms briefly:
   (i) Mobile Hardware
   (ii) Total Quality Management (TQM)
   (iii) Primary Memory
   (iv) Intrusion Detection System (IDS)
   (v) Switch
   (vi) Computer Network
   (vii) Information System
   (viii) Knowledge-Level Systems
   (ix) Cryptography
   (x) Segregation of Duties

2. Differentiate between the following:
   (i) Public Data Network and Private Data Network
   (ii) Parallel Data Transmission and Serial Data Transmission
   (iii) Thick Client and Thin Client
   (iv) Software as a Service (SaaS) and Platform as a Service (PaaS) in Cloud Computing
   (v) Hardware Resources and Software Resources
   (vi) Broadcast Networks and Switched Networks
   (vii) Consumer-to-Business (C2B) e-Commerce and Consumer-to-Consumer (C2C) e-Commerce
   (viii) Strategic-Level Systems and Operational-Level Systems
   (ix) Private Cloud and Hybrid Cloud in Cloud Computing
   (x) Role-based Access Control (RBAC) and Rules-based Access Control (RAC)

3. Write short note on the following:
   (i) TouchPad
   (ii) Protocols
   (iii) Data Flow Diagram

     (iv) Star Network

     (v)   Business Intelligence

     (vi) Intranet

     (vii) Network Virtualization

     (viii) Flowchart

     (ix) Instruction Set Architecture

     (x)   Business Process Automation (BPA)

Business Process Management Life Cycle

4.   Discuss different phases of Business Process Management (BPM) Life Cycle.

Input Controls in BPA

5.   Discuss Input Controls and their categories in Business Process Automation.

OSI Model

6.   Discuss OSI model in detail.

Supply Chain Management

7.   Discuss Supply Chain Management (SCM) and its components.

Business Process Automation

8.   What are the benefits of pursuing Business Process Automation (BPA)?

Operating System

9.   Discuss Operating System and various activities performed by it?

Executive Information Systems

10.   Discuss Executive Information System (EIS) and its components.

Relational Database Model

11.   Discuss Relational Database Model.

Switched Networks

12.   Discuss various switching techniques in telecommunication networks.

Network Vulnerabilities

13.   Define Vulnerability in a Network. What are the factors responsible for the occurrence of Vulnerabilities?

Cloud Computing

14.   Discuss advantages and disadvantages of Cloud Computing.

Mapping Systems

15. (a) Discuss different types of relationships in an E-R Diagram.

    (b) Discuss advantages and limitations of using Data Flow Diagram.

    (c) Discuss Decision Table in brief.

SUGGESTED ANSWERS/HINTS

1. (i) **Mobile Hardware:** Mobile Hardware includes mobile devices or device components that receive or access the service of mobility. They would range from Portable laptops, Smart phones, Tablet PC's to Personal Digital Assistants (PDAs). These devices will have receptors that are capable of sensing and receiving signals. These devices are configured to operate in full- duplex, whereby they are capable of sending and receiving signals at the same time.

    (ii) **Total Quality Management (TQM):** Total Quality Management (TQM) is a comprehensive and structured approach to organizational management that seeks to improve the quality of products and services through ongoing refinements in response to continuous feedback. TQM processes are divided into four sequential categories: Plan, Do, Check, and Act (the PDCA cycle).

    (iii) **Primary Memory:** These are devices in which any location can be accessed in any order (in contrast with sequential order) directly by the CPU. These are primarily of two types: Random Access Memory (RAM) and Read Only Memory (ROM).

    Random Access Memory (RAM)

    - This is Read Write memory.
    - Information can be read as well as modified.
    - Volatile in nature means Information is lost as soon as power is turned off.

    Read Only Memory (ROM)

    - This is non volatile in nature (contents remain even in absence of power).
    - Usually, these are used to store small amount of information for quick reference by CPU.
    - Information can be read not modified.
    - Generally used by manufacturers to store data & programs.

    (iv) **Intrusion Detection System (IDS):** An Intrusion Detection System is a device or software application that monitors network or system activities for malicious activities or policy violations and produces reports to a Management Station. The goal of intrusion detection is to monitor network assets to detect anomalous behaviour and misuse. IDS are primarily of two types: Network Intrusion Detection (NID) and Host-based Intrusion Detection (HID).

(v) **Switch:** Switch is a communications processor that makes connections between telecommunications circuits in a network so that a telecommunications message can reach its intended destination.

(vi) **Computer Network:** It is a collection of computers and other hardware interconnected by communication channels that allow sharing of resources and information. Where at least one process in one device is able to send/receive data to/from at least one process residing in a remote device, then the two devices are said to be in a network. A network is a group of devices connected to each other.

(vii) **Information System:** Information System (IS) is a combination of people, hardware, software, communication devices, network and data resources that processes (can be storing, retrieving, transforming information) data and information for a specific purpose. The system needs inputs from user (key in instructions and commands, typing, scanning) which will then be processed (calculating, reporting) using technology devices such as computers, and produce output (printing reports, displaying results) that will be sent to another user or other system via a network and a feedback method that controls the operation.

(viii) **Knowledge-Level Systems:** These are the systems that support discovery, processing and storage of knowledge and data workers. These further control the flow of paper work and enable group working.

(ix) **Cryptography:** Cryptography is the practice and study of techniques for secure communication in the presence of third parties (called Adversaries). More generally, it is about constructing and analyzing protocols that overcome the influence of adversaries and which are related to various aspects in information security such as data confidentiality, integrity, authentication, and non-repudiation. These are the programs that transform data into codes that appear meaningless to anyone who does not possess the authentication to access the respective system resource or file.

(x) **Segregation of Duties:** Segregation of duties refers to dividing responsibility for different portions of a transaction among several people. This ensures that duties are assigned to individuals in a manner that ensures that no one individual can control both the recording function and the procedures relative to processing a transaction. The functions to be performed by different people are authorizing (approval) transactions, recording (capture) transactions and maintaining custody (protect) of assets, thereby ensuring that business activities are performed efficiently and in accordance with management's objectives.

2. (i) Differences between Public Data Network and Private Data Network are given below:

- **Public Data Network:** A Public Data Network is defined as a network shared and accessed by users not belonging to a single organization. It is a network

established and operated by a telecommunications administration, or a recognized private operating agency, for the specific purpose of providing data transmission services for the public. The Internet is an example of a Public Data Network.

- **Private Data Network:** Private Data Network provides businesses, government agencies and organizations of all sizes as a dedicated network to continuously receive and transmit data critical to both the daily operations and mission critical needs of an organization.

(ii) Differences between Parallel Data Transmission and Serial Data Transmission are given below:

- **Parallel Data Transmission:** In Parallel data transmission, there are separate parallel paths corresponding to each bit of the byte so that all character bits are transmitted simultaneously. Centronic port is the example of parallel port used for printer.

- **Serial Data Transmission:** In Serial data transmission, the bits of each byte are sent along a single path one after another. As one bit follows another, so only one communication channel is required between two communicating devices. RS-232 is an example of serial port used for the mouse or MODEM.

(iii) Differences between Thick client and Thin Client are as follows:

Thick Client: A Thick client is a client that performs the bulk of any data processing operations itself, and does not necessarily rely on the server. Unlike thin clients, thick clients do not rely on a central processing server because the processing is done locally on the user system, and the server is accessed primarily for storage purposes. For that reason, thick clients often are not well-suited for public environments. To maintain a thick client, IT needs to maintain all systems for software deployment and upgrades, rather than just maintaining the applications on the server. For example – Personal Computer.

Thin Client: A Thin client uses the resources of the host computer. A thin client generally only presents processed data provided by an application server, which performs the bulk of any required data processing. A thin client machine is going to communicate with a central processing server, meaning there is little hardware and software installed on the user's machine. A device using web application (such as Office Web Apps) is a thin client.

(iv) Differences between Software as a Service (SaaS) and Platform as a Service (PaaS) in Cloud Computing are as follows:

Software as a Service (SaaS): Software as a Service (SaaS) features a complete application offered as a service on-demand. A service provider hosts the application at its data centre over the Internet and customer accesses it via a standard Web browser. For example - Google Apps.

Platform as a Service (PaaS): Platform as a Service (PaaS) delivery model allows a customer to rent virtualized servers and associated services used to run existing applications, or to design, develop, test, deploy and host applications. The consumer may create software using tools and/or libraries from the provider. The consumer may also control software deployment and configuration settings. The provider provides the networks, servers, storage, and other services. For example, AppScale allows a user to deploy some applications written for Google App Engine to their own servers.

(v)   Differences between Hardware Resources and Software Resources are as follows:

Hardware Resources: These refer to Machines - computers, video monitors, magnetic disk drives, printers, optical scanners and Media - floppy disks, magnetic tape, optical disks, plastic cards, paper forms.

Software Resources: These refer to Programs - operating system programs, spreadsheet programs, word processing programs, payroll programs and Procedures - data entry procedures, error correction procedures, paycheck distribution procedures.

(vi) Differences between Broadcast Networks and Switched Networks are as follows:

Broadcast Networks: In Broadcast networks, data transmitted by one node is received by many, sometimes all, of the other nodes. This refers to a method of transferring a message to all recipients simultaneously. For example – a corporation or other voluntary association, that provides live television or recorded content such as movies, newscasts, sports, public affairs programming, and other television programs for broadcast over a group of radio stations or television stations.

Switched Networks - In switched-communication networks, the data transferred from source to destination is routed through the switch nodes. The way in which the nodes switch data from one link to another, as it is transmitted from source to destination node, is referred to as a switching technique. Three common switching techniques are Circuit Switching, Packet Switching, and Message Switching.

(vii) Differences between Consumer-to-Business (C2B) e-Commerce and Consumer-to-Consumer (C2C) are as follows:

Consumer-to-Business (C2B) e-Commerce: In C2B e-Commerce model, consumers directly contact with business vendors by posting their project work online so that the needy companies review it and contact the consumer directly with bid. The consumer reviews all the bids and selects the company for further processing. Some examples are guru.com, rentacoder.com, getacoder.com, freelancer.com.

Consumer-to-Consumer (C2C) e-Commerce: C2C e-Commerce is an Internet - facilitated form of commerce that has existed for the span of history in the form of barter, flea markets, swap meets, yard sales and the like. C2C e-Commerce sites

provide a virtual environment in which consumers can sell to one another through a third-party intermediary.

(viii) Differences between Strategic-Level Systems and Operational-Level Systems are given as follows:

Strategic-Level Systems: These systems are strategic managers to track and deal with strategic issues that assist in long-range planning. A principle area is tracking changes in the external conditions (market sector, employment levels, share prices, *etc.*) and matching these with the internal conditions of the organization.

Operational-Level Systems: Support operational managers tracking elementary activities. These can include tracking customer orders, invoice tracking, etc. Operational-level systems ensure that business procedures are followed.

(ix) Differences between Private Cloud and Hybrid Cloud in Cloud Computing are given as follows:

Private Cloud: This cloud computing environment resides within the boundaries of an organization and is used exclusively for the organization's benefits. These are also called internal clouds. They are built primarily by IT departments within enterprises who seek to optimize utilization of infrastructure resources within the enterprise by provisioning the infrastructure with applications using the concepts of grid and virtualization. The benefit of a Private Cloud is that it enables an enterprise to manage the infrastructure and have more control.

Hybrid Cloud: It is maintained by both internal and external providers. It is a composition of two or more clouds (Private, Community or Public). They have to maintain their unique identity, but are bound together by standardized data and application portability. With a hybrid cloud, organizations might run non-core applications in a public cloud, while maintaining core applications and sensitive data in-house in a private cloud.

(x) Differences between Role-based Access Control (RBAC) and Rules-based Access Control (RAC) are as follows:

Role-based Access Control (RBAC): RBAC largely eliminates discretion when providing access to objects. Instead, administrators or automated systems place subjects into roles. Subjects receive only the rights and permissions assigned to those roles. When an employee changes jobs, all previous access is removed, and the rights and permissions of the new role are assigned.
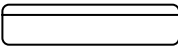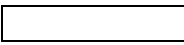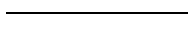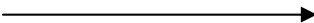
Rules-based Access Control (RAC): RAC differs from RBAC methods because it is largely context-based. RBAC, for example, enforces static constraints based on a user's role. RAC, however, also takes into account the data affected, the identity attempting to perform a task, and other triggers governed by business rules. A manager, for example, has the ability to approve his/her employees' hours worked. However, when s/he attempts to approve his/her own hours, a rule built into the

application compares the employee record and the user, sees they are the same, and temporarily removes approval privilege.

3. (i) **TouchPad:** A Touchpad is a pointing device featuring a tactile sensor, a specialized surface that can translate the motion and position of a user's fingers to a relative position on screen. Touchpad is a common feature of laptop computers, and is also used as a substitute for a mouse where desk space is scarce. Because it varies in size, it can also be found on Personal Digitial Assistants (PDAs) and some portable media players. Wireless touchpads are also available as detached accessories. Touchpads operate in one of several ways, including capacitive sensing and conductance sensing.

(ii) **Protocols:** Protocols are software that performs a variety of actions necessary for data transmission between computers. Stated more precisely, protocols are a set of rules for inter-computer communication that have been agreed upon and implemented by many vendors, users and standards bodies to ensure that the information being exchanged between the two parties is received and interpreted correctly. Ideally, a protocol standard allows heterogeneous computers to talk to each other.

A protocol defines the following three aspects of digital communication.

(a) **Syntax:** The format of data being exchanged, character set used, type of error correction used, type of encoding scheme (e.g., signal levels) being used.

(b) **Semantics:** Type and order of messages used to ensure reliable and error free information transfer.

(c) **Timing:** Defines data rate selection and correct timing for various events during data transfer.

(iii) **Data Flow Diagram (DFD):** It is a graphical representation of the flow of data through an information system. A DFD illustrates technical or business processes with the help of the external data stored, the data flowing from a process to another, and the results. The four major DFD component's symbols are as follows:

Meaning	Symbols
Process	⬭ or ▭
Data Store	▭ or ▭
Entity	▭
Data Flow	→

DFDs may be partitioned into levels that represent increasing information flow and functional detail. Therefore, the DFD provides a mechanism for functional modeling as well as information flow modeling.

(iv) Star Network: The star network, a popular network configuration, involves a central unit that has a number of terminals tied into it. The characteristics of a star network are:

- It ties end user computers to a central computer.

- The central unit in the star network acts as the traffic controller among all the other computers tied to it. The central computer is usually a mainframe (host), which acts as the file server.

- A star network is well suited to companies with one large data processing facility shared by a number of smaller departments. Many star networks take the form of hierarchical networks with a centralized approach.
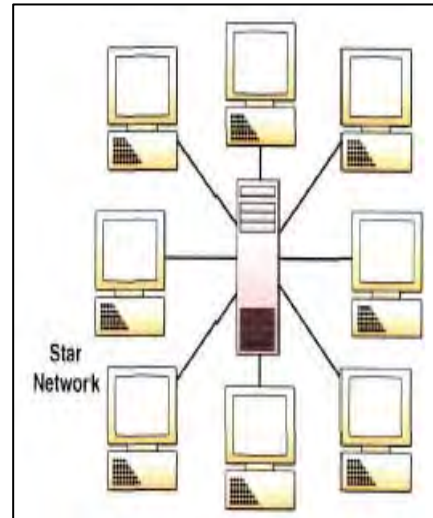
Star Network

Advantages of the star network include the following:

- Several users can use the central unit at the same time.

- It is easy to add new nodes and remove existing nodes.

- A node failure does not bring down the entire network.

- It is easier to diagnose network problems through a central hub.

Disadvantages of the star network are as follows:

- The whole network is affected if the main unit "goes down," and all communications stop.

- The other computers in the star are heavily dependent on the central host computer. If it fails, there is no backup processing and communications capability and the local computers will be cut off from the corporate headquarters and from each other, hence considered less reliable.

- Cost of cabling the central system and the points of the star network together are very high.

(v) Business Intelligence: In today's IT-driven society, the success of an enterprise is heavily influenced by business intelligence. Business Intelligence (BI) enables managers to see things with more clarity, and empowers them to peek into the possible future.

There are many definitions of Business Intelligence (BI).

(a)   BI is essentially timely, accurate, high-value, and actionable business insights, and the work processes and technologies used to obtain them.

(b)   Business Intelligence (BI) is the delivery of accurate, useful information to the appropriate decision makers within the necessary time frame to support effective decision making for business processes.

(c)   BI in simple words, refers to the process of collecting and refining information from many sources, analyzing and presenting the information in useful ways so that users can make better business decisions.

(vi) **Intranet:** An Intranet is a network inside an organization that uses Internet technologies such as web browsers and servers, TCP/IP network protocols, HTML hypermedia document publishing and databases, and so on, to provide an Internet-like environment within an enterprise for information sharing, communications, collaboration, and the support of business processes.

An Intranet is protected by security measures such as passwords, encryption, and firewalls, and thus can be accessed by authorized users through the Internet. A Company's Intranet can also be accessed through the Intranets of customers, suppliers, and other business partners via extranet links.

(vii) **Network Virtualization:** In IT, Virtualization is the process of creating logical computing resources from available physical resources. Network Virtualization allows a large physical network to be provisioned into multiple smaller logical networks and conversely allows multiple physical LANs to be combined into a larger logical network. This behavior allows administrators to improve network traffic control, enterprise and security.

Major applications of the concepts of the virtualization are Server Consolidation, Disaster Recovery, Testing & Planning, Portable Applications and Portable Workspaces.

(viii) **Flowchart:** A Flowchart is a type of diagram that represents an algorithm, workflow or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows. Flowcharts are used in analyzing, deigning, documenting or managing process or program in various fields. It is like a blueprint, in that it shows the general plan, architecture, and essential details of the proposed structure. It is an essential tool for programming and it illustrates the strategy and thread of logic followed in the program. It allows the programmer to compare different approaches and alternatives on paper and often shows interrelationships that are not immediately apparent. A flowchart helps the programmer avoid fuzzy thinking and accidental omissions of intermediate steps.

(ix) **Instruction Set Architecture:** Instruction Set Architecture (ISA) is the abstract model of a computing system that is seen by a machine language programmer

including the instruction set; memory address modes; processor registers; and address and data formats. Basically, ISA is related to the programming of a computer – that is, how the computer understands what each element in its basic language means, what instructions are to be carried out and in what order, etc. The ISA basically deals with what the chip does. It's a sort of 'bridge' between software and hardware. Understanding how it all works requires knowledge of the structure of a computer and its assembly language. The instructions may be Data Movement Instructions, Transfer of Control, Arithmetic/Logical Instructions; Input/output and some miscellaneous instructions that handle interrupts and activities.

(x) Business Process Automation (BPA): BPA is a strategy to automate business processes so as to bring benefit to enterprise in terms of cost, time and effort. The core objective of BPA is achieved through integrating various business processes. The key benefits of BPA are given below:

♦ **Saving on costs:** Automation leads to saving in time and labor costs.

♦ **Staying ahead in competition:** Today, in order to survive, businesses need to adopt automation.

♦ **Fast service to customers**: Gradually business managers realized that automation could help them to serve their customers faster and better.

4. **Business Process Management Life Cycle (BPM-L Cycle):** An Enterprise Resource Planning (ERP) application divides BPM into the following phases:

(i) **Analysis phase:** This involves analysis of the current environment and current processes, identification of needs and definition of requirements.

(ii) **Design phase:** This involves evaluation of potential solutions to meet the identified needs, business process designing and business process modeling.
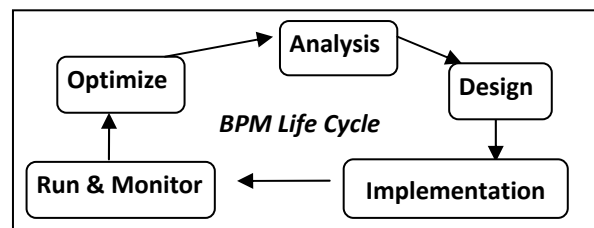
BPM Life Cycle

(iii) **Implementation phase:** This involves project preparation, blue printing, realization, final preparation, go live and support.

(iv) **Run and Monitor phase:** This involves business process execution or deployment and business process monitoring.

(v) **Optimize:** Iterate for continuous improvement.

5. **Input Controls:** These are responsible for ensuring the accuracy and completeness of data that are input into an application system. Input controls are important since substantial time is spent on inputting data which involves human intervention and are therefore prone to errors and fraud. The type of data input method used in an information system affects asset safeguarding, data integrity, system effectiveness, and system efficiency objectives. If data is keyed into an information system via a terminal, high-quality screen design is important to minimizing input errors and to achieving effective and efficient input of data. Different categories of Input Controls in BPA environment are as follows:

    - **Source Document Controls:** From a control viewpoint, a well-designed source document reduces the likelihood of data recording errors, increases the speed with which data can be recorded and controls the work flow. Source Document Controls facilitate the data entry into a computer system and subsequent reference checking.

    - **Data Coding Controls:** Data Coding Controls are put in place to reduce user error during data feeding.

    - **Batch Controls:** These are put in place at locations where batch processing is being used. Batch processing is where there is a time gap between occurrence and recording of transactions, that is, transactions are not recorded at the time of occurrence but are accumulated and a set (based on number/ time) is processed.

    - **Validation Controls:** These validate the accuracy/correctness of input data. Input Validation Controls are intended to detect errors in transaction data before the data are processed.

6. **The OSI Model:** It is a a seven-layer model developed by the International Standards Organization (ISO) to serve as a standard model for network architectures. Seven layers of OSI include the following:

    - **Layer 7 or Application Layer:** The application layer of OSI layer architecture is closest to the end user that interacts with software applications and provides user services by file transfer, file sharing, etc. Database concurrency and deadlock situation controls are undertaken at this layer level. This is the layer at which communication partners are identified, quality of service is identified, user authentication and privacy are considered, and any constraints on data syntax are identified.

    - **Layer 6 or Presentation Layer:** This layer is usually a part of an operating system that converts incoming and outgoing data from one presentation format to another. The presentation service data units are then encapsulated into Session Protocol Data Units, and moved down the stack. It further controls on screen display of data, transforms data to a standard application interface. Encryption, data compression can also be undertaken at this layer level.

- **Layer 5 or Session Layer:** This layer sets up, coordinates, and terminates conversations, exchanges, and dialogs between the applications at each end. It deals with session and connection coordination. It provides for full-duplex, half-duplex, or simplex operation, and establishes check pointing, adjournment, termination, and restart procedures.

- **Layer 4 or Transport Layer:** This layer ensures reliable and transparent transfer of data between user processes, assembles and disassembles message packets, and provides error recovery and flow control. Multiplexing and encryption are undertaken at this layer level. This means that the Transport Layer can keep track of the segments and retransmit those that fail.

- **Layer 3 or Network Layer:** The Network Layer provides the functional and procedural means of transferring variable length data sequences from a source to a destination via one or more networks, while maintaining the quality of service requested by the Transport Layer. The Network Layer makes a choice of the physical route of transmission, creates a virtual circuit for upper layers to make them independent of data transmission and switching, establishes, maintains, terminates connections between the nodes and ensure proper routing of data.

- **Layer 2 or Data Link Layer:** The Data Link Layer responds to service requests from the Network Layer and issues service requests to the Physical Layer. The Data Link Layer is the protocol layer which transfers data between adjacent network nodes in a wide area network or between nodes on the same local area network segment. This layer is also a hardware layer which specifies channel access control method and ensures reliable transfer of data through the transmission medium. It provides the functional and procedural means to transfer data between network entities and to detect and possibly correct errors that may occur in the Physical Layer.

- **Layer 1 or Physical Layer:** The Physical Layer is a hardware layer which specifies mechanical features as well as electromagnetic features of the connection between the devices and the transmission. In particular, it defines the relationship between a device and a physical medium. This includes the layout of pins, voltages, cable specifications, Hubs, repeaters, network adapters, Host Bus Adapters (HBAs used in Storage Area Networks) and more.

7. **Supply Chain Management (SCM):** Supply Chain Management is a chain that starts with customers and ends with customers. Supply Chain Management may be defined as the process of planning, implementing and controlling the operations of the supply chain with the purpose of satisfying the customer's requirement as efficiently as possible. Supply Chain spans all movement and storage of raw materials, Work-in-process, inventory and finished goods from the point of origin to the point of consumption.

Components of SCM are as follows:

(a) **Procurement/Purchasing** - This begins with the purchasing of parts, components, or services. Procurement must ensure that the right items are delivered in the exact quantities at the correct location on the specified time schedule at minimal cost. This means that procurement must concern itself with the determination of who should supply the parts, the components, or the services. It must address the question of assurance that these suppliers will deliver as promised

(b) **Operations** - The second major element of SCM system is operations. Having received raw materials, parts, components, assemblies, or services from suppliers, the firm must transform them and produce the products or the services that meet the needs of its consumers. It must conduct this transformation in an efficient and effective manner for the benefit of the supply chain management system.

(c) **Distribution** - The third element of the SCM system is distribution. Distribution involves several activities—transportation (logistics), warehousing, and Customer Relationship Management (CRM). The first and most obvious is logistics—the transportation of goods across the entire supply chain.

(d) **Integration** - The last element of SCM is the need for integration. It is critical that all participants in the service chain recognize the entirety of the service chain. The impact of the failure to adopt a system-wide perspective—that is, examining the totality of the chain can significantly increase costs and destroy value.

8. Business Process Automation is the basic component of an enterprise-wide automation and management scheme for both business and IT workflow. With BPA, we can optimize and streamline our business processes by automating the process components. By improving the performance, accuracy and efficiency of the key business processes, the enterprise is made more efficient and responsive to customer and employee needs. Some benefits of pursuing such automation include the following:

- **Reducing the Impact of Human Error:** BPA removes human participation in the process, which is the source of many errors.

- **Transforming Data into Information:** BPA can, apart from collecting and storing data also analyze data and make it available in a form that is useful for decision-making.

- **Improving performance and process effectiveness:** In many cases, tasks that must be done manually are the bottleneck in the process. Automating those manual tasks speeds up the effective throughput of the application.

- **Making users more efficient and effective:** People can focus their energies on the tasks they do best, allowing the computers to handle those that machines are best suited for.

- **Making the business more responsive:** Enterprises can easily automate new applications and processes as they are introduced that provide greater control over business and IT processes.

- **Improving Collaboration and Information Sharing:** Business processes designed through a collaborative interface mean IT can integrate its processes with the business-side logic that drives day-to-day operations.

- **Cost Saving:** Automation leads to saving in time and labor costs through higher efficiency and better management of the people involved;

- **To remain competitive:** To provide the level of products and services as offered by competition.

- **Fast service to customers:** Automation shortens cycle times in the execution of processes through improved and refined business workflows and help enterprises to serve their customers faster and better.

9. **Operating System:** An Operating System (OS) is a set of computer programs that manages computer hardware resources and acts as an interface with computer applications programs. The operating system is a vital component of the system software in a computer system. Application programs usually require an operating system to function that provides a convenient environment to users for executing their programs. Computer hardware with operating system can thus be viewed as an extended machine, which is more powerful and easy to use. Some prominent Operating systems used nowadays are Windows 7, Windows 8, Linux, UNIX, etc.

A variety of activities that are executed by Operating systems include the following:

- **Performing hardware functions:** Application programs to perform tasks have to obtain input from keyboards, retrieve data from disk & display output on monitors. Achieving all this is facilitated by operating system. Operating system acts as an intermediary between the application program and the hardware.

- **User Interfaces:** An important function of any operating system is to provide user interface. Command based User Interface (UI) and Graphic User Interface (GUI) which uses icons & menus like in the case of Windows, will be provided by Operating system.

- **Hardware Independence:** Every computer could have different specifications and configurations of hardware. Operating system provides Application Program Interfaces (API) which can be used by application developers to create application software, thus obviating the need to understand the inner workings of Operating System and hardware. Thus, Operating System gives us hardware independence.

- **Memory Management:** Memory Management feature of Operating System allows controlling how memory is accessed and maximize available memory & storage.

Operating System also provides Virtual Memory by carving an area of hard disk to supplement the functional memory capacity of RAM. In this way, it augments memory by creating a virtual RAM.

- **Task Management:** Task Management feature of Operating System helps in allocating resources to make optimum utilization of resources. This facilitates a user to work with more than one application at a time i.e. multitasking and also allows more than one user to use the system i.e. timesharing.

- **Networking Capability:** Operating Systems can provide systems with features & capabilities to help connect computer networks. Like Linux & Windows 8 give us an excellent capability to connect to internet.

- **Logical Access Security:** Operating System provide logical security by establishing a procedure for identification & authentication using a User ID and Password. It can log the user access thereby providing security control.

- **File Management:** The operating system keeps a track of where each file is stored and who can access it, based on which it provides the file retrieval.

10. **Executive Information Systems (EIS):** An Executive Information System (EIS) is the nature of Information System used by executives to access and administer the data they entail to make informed business decisions. In the hierarchical structure of information systems, the EIS is at the pinnacle and is designed to renovate all significant data (from project to process to budget) into aggregated information that makes sense and brings value to the by and large business strategy. EIS is able to link data from various sources both internal and external to provide the amount and kind of information executives find useful. These systems are designed for top management; easy to use; present Information in condensed view; access organization's databases and data external to the organization.

The components of an EIS can typically be classified as below:

Component	Description
Hardware	Includes Input data-entry devices, CPU, Data Storage files and Output Devices.
Software	Includes Text base software, Database, and Graphic types such as time series charts, scatter diagrams, maps, motion graphics, sequence charts, and comparison-oriented graphs (i.e., bar charts) Model base.
User Interface	Includes hardware (physical) and software (logical) components by which people (users) interact with a machine. Several types of interfaces can be available to the EIS structure, such as scheduled reports, questions/answers, menu driven, command language,

	natural language, and input/output.
Telecommunication	Involves transmitting data from one place to another in a reliable networked system.

11. **Relational Database Model:** A relational database allows the definition of data and their structures, storage and retrieval operations and integrity constraints that can be organized in a table structure. A table is a collection of records and each record in a table contains the same fields. Both the hierarchical and network data structures require explicit relationships, or links, between records in the database. Both structures also require that data be processed one record at a time. The relational database structure departs from both these requirements. Three key terms are used extensively in relational database models: **Relations, Attributes,** and **Domains.**

A Relation is a table with columns and rows. The named columns of the relation are called Attributes, and the Domain is the set of values the attributes are allowed to take.

All relations in a relational database have to adhere to some basic rules to qualify as relations. First, the ordering of columns is immaterial in a table. Second, there can't be identical record in a table. And third, each record will contain a single value for each of its attributes.

12. Three common switching techniques are **Circuit Switching**, **Packet Switching**, and **Message Switching**.

   (i)   **Circuit Switching:** A Circuit Switching network is one that establishes a fixed bandwidth circuit (or channel) between nodes and terminals before the users may communicate, as if the nodes were physically connected with an electrical circuit. The route is dedicated and exclusive, and released only when the communication session terminates. Circuit switching is what most of us encounter on our home phones.

   (ii) **Packet Switching:** Packet switching refers to protocols in which messages are broken up into small transmission units called packets, before they are sent. Each packet is transmitted individually across the net. The packets may even follow different routes to the destination. Since there is no fixed path, different packets can follow different path and thus they may reach to destination out of order.

   (iii) **Message Switching:** In message switching, end-users communicate by sending each other a message, which contains the entire data being delivered from the source to destination node. As a message is routed from its source to its destination, each intermediate switch within the network stores the entire message, providing a very reliable service. The intermediary nodes (switches) have the responsibility of conveying the received message from one node to another in the network. Therefore, each intermediary node within the network must store all messages before retransmitting them one at a time as proper resources become

available. Electronic mail (e-mail) and voice mail are examples of message switching systems.

13. **Vulnerability:** Vulnerability is an inherent weakness in the design, configuration, or implementation of a network or system that renders it susceptible to a threat.

The following factors are responsible for occurrence of vulnerabilities in the software:

- **Software Bugs** - Software bugs are so common that users have developed techniques to work around the consequences, and bugs that make saving work necessary every half an hour or crash the computer every so often are considered to be a normal part of computing. For example - buffer overflow, failure to handle exceptional conditions, access validation error, input validation errors are some of the common software flaws.

- **Timing Windows** - This problem may occur when a temporary file is exploited by an intruder to gain access to the file, overwrite important data, and use the file as a gateway for advancing further into the system.

- **Insecure default configurations** - Insecure default configurations occur when vendors use known default passwords to make it as easy as possible for consumers to set up new systems. Unfortunately, most intruders know these passwords and can access systems effortlessly.

- **Trusting Untrustworthy information** - This is usually a problem that affects routers, or those computers that connect one network to another. When routers are not programmed to verify that they are receiving information from a unique host, bogus routers can gain access to systems and do damage.

- **End users** - Generally, users of computer systems are not professionals and are not always security conscious. For example, when the number of passwords of an user increases, user may start writing them down, in the worst case to places from where they are easy to find. In addition to this kind of negligence towards security procedures users do human errors, for example save confidential files to places where they are not properly protected.

14. Advantages of Cloud Computing are as follows:

- **Cost Efficient:** Cloud computing is probably the most cost efficient method to use, maintain and upgrade.

- **Almost Unlimited Storage:** Storing information in the cloud gives us almost unlimited storage capacity.

- **Backup and Recovery:** Since all the data is stored in the cloud, backing it up and restoring the same is relatively much easier than storing the same on a physical

device. Furthermore, most cloud service providers are usually competent enough to handle recovery of information.

- **Automatic Software Integration:** In the cloud, software integration is usually something that occurs automatically. Not only that, cloud computing allows us to customize the options with great ease. Hence, we can handpick just those services and software applications that we think will best suit the particular enterprise.

- **Easy Access to Information:** Once we register ourselves in the cloud, we can access the information from anywhere, where there is an Internet connection.

- **Quick Deployment:** Once we opt for this method of functioning, the entire system can be fully functional in a matter of a few minutes. Of course, the amount of time taken here will depend on the exact kind of technology that we need for our business.

Disadvantages of Cloud Computing are as follows:

- **Technical Issues:** This technology is always prone to outages and other technical issues. Even the best cloud service providers run into this kind of trouble, in spite of keeping up high standards of maintenance. We will invariably be stuck in case of network and connectivity problems.

- **Security in the Cloud:** Surrendering all the company's sensitive information to a third-party cloud service provider could potentially put the company to great risk.

- **Prone to Attack:** Storing information in the cloud could make the company vulnerable to external hack attacks and threats. Nothing on the Internet is completely secure and hence, there is always the lurking possibility of stealth of sensitive data.

15. (a) **Types of Relationships in E-R Diagram**
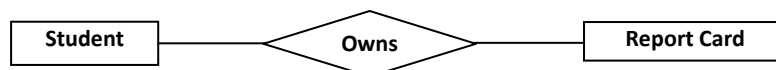
The various types of relationships are as follows:

(i) **One-to-One relationship (1:1) -** A One-to-One relationship is shown on the diagram by a line connecting the two entities.

Example: A Teacher may be in-charge of a class. Each class must be in-charge of by one teacher.
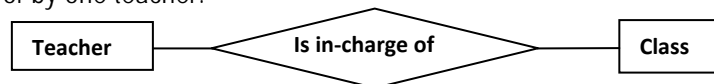
A student has one and only one Report card. Each report card is owned by one and only one student.

(ii) **One-to-Many relationships (1:N) –** A One-to-Many relationship is shown on the diagram by a line connecting the two entities with a "crow's foot" symbol denoting the 'many' end of the relationship.

Example: A student may borrow some books from the library. A book in the library may be borrowed by at most a student.

| Student | Borrows | Book |

A class is formed by a group of atleast one student. Each student is allocated to one and only one class.

| Class | Formed by | Student |

Further, a teacher teaches many courses.

(iii) **Many-to-One relationships (M:1)** – It is the reverse of One-to-Many relationship.

Example: As in two or more parent records to a single child record. For example,

| Parent | Records to | Child |

When three administrators in a small town report to one minister.

| Administrators | Report to | Minister |

(iv) **Many-to-Many relationships (M:N) –** A Many-to-Many relationship is shown on the diagram by a line connecting the two entities with 'crow's foot' symbols at both ends.

Example: A student enrolls in atleast one course. A course is enrolled by at least one student.

| Student | Enrolls in | Course |

A student may apply for more than one scholarship. Each scholarship may receive some applications from student, or none.

| Student | Applies for | Scholarship |

(b) Advantages of using Data Flow Diagram are as follows:

*   It aids in describing the boundaries of the system.

*   It is beneficial for communicating existing system knowledge to the users.

*   A straightforward graphical technique which is easy to recognize.

*   DFDs can provide a detailed representation of system components.

*   It is used as the part of system documentation file.

*   DFDs are easier to understand by technical and nontechnical audiences

*   It supports the logic behind the data flow within the system.

Limitations of using Data Flow Diagram are as follows:

*   It make the programmers little confusing concerning the system.

*   The biggest drawback of the DFD is that it simply takes a long time to create, so long that the analyst may not receive support from management to complete it.

*   Physical considerations are left out.

(c) **Decision Table:** A Decision Table is a table which may accompany a flowchart, defining the possible contingencies that may be considered within the program and the appropriate course of action for each contingency. A Decision Table is divided into four parts:

Condition Stub	Condition Entries
Action stub	Action Entries

(i) **Condition Stub** - which comprehensively lists the comparisons or conditions;

(ii) **Action Stub** - which comprehensively lists the actions to be taken along the various program branches;

(iii) **Condition Entries** - which list in its various columns the possible permutations of answer to the questions in the conditions stub; and

(iv) **Action Entries -** which lists, in its columns corresponding to the condition entries the actions contingent upon the set of answers to questions of that column.

SECTION – B: STRATEGIC MANAGEMENT
QUESTIONS

Correct/Incorrect with reasoning

1. State with reasons which of the following statements are correct/incorrect:

    (a) Substitute products are latent source of competition.

    (b) Enterprises pursue multiple objectives rather than a single objective.

    (c) The management of funds can play a pivotal role in strategy implementation.

    (d) Not-for-profit organizations are not required to have a strategy.

    (e) The process of strategy avoids matching potential of the organization with the environment opportunities.

    (f) There is both opportunity and challenge in 'Change'.

    (g) Efficiency and effectiveness mean the same in strategic management.

    (h) Production strategy implements, supports and drives higher strategies.

    (i) E-commerce technology opens up a host of opportunities for reconfiguring industry and company value chains.

    (j) A company's strategy has always to be proactive in nature.

Differences between the two concepts

2. Distinguish between the following:

    (a) Operational Control and Management Control.

    (b) Strategy Formulation and Strategy Implementation.

    (c) DMAIC and DMADV Methodology of Six Sigma.

    (d) Top-Down and Bottom-Up Strategic Planning.

Short notes

3. Write short notes on the following:

    (a) Socio-cultural environment

    (b) Portfolio analysis

    (c) Augmented marketing

    (d) Six sigma

    (e) Strategic groups

Brief answers

4. Briefly answer the following questions:

    (a) Briefly explain Premise Control.

    (b) Define Total Quality Management.

    (c) Explain the Concept of strategic Intent.

    (d) Define Forward and Backward Linkages.

    (e) Explain briefly the Competitive advantage.

Descriptive Answers

Chapter 1-Business Environment

5. Discuss the Porter's model for systematically diagnosing the significant competitive pressures in a market.

6. Briefly explain macro environmental factors that affect an organization's strategy.

Chapter 2-Business Policy and Strategic Management

7. What is Strategic Management? What benefits accrue by following a strategic approach to managing?

8. What are the major dimensions of strategic decision making?

Chapter 3-Strategic Analysis

9. Explain how TOWS matrix can generate strategic options within external and internal environment.

10. How an organization analyses its business portfolio explain on market growth rate and relative market share.

Chapter 4-Strategic Planning

11. What is turnaround management? What are various stages in its implementation?

12. Discuss strategic alternatives with reference to Michael Porter's strategies.

Chapter 5-Formulation of Functional Strategy

13. What is supply chain management? Is it same as logistics management? Discuss.

14. What do you mean by financial strategy of an organization? How the worth of a business is evaluated?

Chapter 6-Strategic Implementation and Control

15. "The role played by middle management is diminishing as the tasks performed by them are increasingly being replaced by the technological tools." Elucidate the statement in terms of its effect on organization structure.

16. Define corporate culture. Also elucidate the statement "Culture is a strength that can also be a weakness".

Chapter 7-Reaching Strategic Edge

17 What is Benchmarking? What are the areas where benchmarking can help?

18. Define Business Process Re-engineering. Briefly outline the steps therein.

SUGGESTED ANSWERS / HINTS

1. (a) **Correct:** Substitute products are a latent source of competition in an industry. In many cases, they become a major constituent of competition. Substitute products offering a price advantage and/or performance improvement to the consumer can drastically alter the competitive character of an industry. For example, coir suffered at the hands of synthetic fibre. Wherever, substantial investment in R&D is taking place, threats from substitute products can be expected. Substitutes, too, usually limit the prices and profits in an industry.

   (b) **Correct:** Enterprises pursues multiple objectives rather than a single objective. In general, we may identify a set of business objectives pursued by a large cross-section of enterprises. These relate to profitability, productive efficiency, growth, technological dynamism, stability, self-reliance, survival, competitive strength, customer service, financial solvency, product quality, diversification, employee satisfaction and welfare, and so on. Enterprises seek to balance these objectives in some appropriate manner.

   (c) **Correct:** The management of funds can play a pivotal role in strategy implementation as it aims at the conservation and optimum utilization of funds objectives which are central to any strategic action. Organizations that implement strategies of stability, growth or retrenchment cannot escape the rigours of a proper management of funds. In fact, good management of funds often creates the difference between a strategically successful and unsuccessful company.

   (d) **Incorrect:** Similar to commercial organizations, 'not-for-profit' organizations must also have a strategy. It is required to give it direction, focus and efficient utilization of resources. In many 'not-for-profit' organizations surpluses are important for their survival and growth.

   (e) **Incorrect:** In the process of strategic management an organisation continuously scan its relevant environment to identify various opportunities and threats. Organisations keen to grow and expand often look for promising opportunities that match their potential. Such opportunities become a good stepping stone for achieving the goals of the organisation.

(f)   **Correct:** It is said that change is inevitable, especially in the context of business environment. Changes in the business environment from time to time throw up new issues before businesses. A right perspective of such new issues is to view them both as challenges and opportunities - challenge because appropriate action is called for and, opportunity because it opens up new potentials for the future plans that would lead to prosperous business.

(g)   **Incorrect:** Efficiency pertains to designing and achieving suitable input output ratios of funds, resources, facilities and efforts whereas effectiveness is concerned with the organization's attainment of goals including that of desired competitive position. While efficiency is essentially introspective, effectiveness highlights the links between the organization and its environment. In general terms, to be effective is to do the right things while to be efficient is to do things rightly.

(h)   **Correct:** For effective implementation of higher level strategies, strategists need to provide direction to functional managers, including production, regarding the plans and policies to be adopted. Production strategy provides a path for transmitting corporate and business level strategy to the production systems and makes it operational. It may relate to production planning, operational system, control and research & development.

(i)   **Correct:** The impact of e-commerce technology on industry and company value chains is profound, paving the way for fundamental changes in the ways business is conducted both internally, and with suppliers and customers. Using the network to link the customers and the suppliers enables just-in-time delivery, reducing inventory costs and allowing production to match demand.

(j)   **Incorrect:** A company's strategy is a blend of proactive actions and reactive actions by the management. Reactive actions are required to address unanticipated developments and environmental conditions. Thus, not every strategic move is the result of proactive and deliberate management actions. At times, some kind of strategic reaction or adjustments are also required.

2.   (a)   Differences between Operational Control and Management Control are as under:

(i)   The thrust of operational control is on individual tasks or transactions as against total or more aggregative management functions. When compared with operational, management control is more inclusive and more aggregative, in the sense of embracing the integrated activities of a complete department, division or even entire organisation, instead or mere narrowly circumscribed activities of sub-units. For example, procuring specific items for inventory is a matter of operational control, in contrast to inventory management as a whole.

(ii)   Many of the control systems in organisations are operational and mechanistic in nature. A set of standards, plans and instructions are formulated. On the other hand the basic purpose of management control is the achievement of

enterprise goals – short range and long range – in an effective and efficient manner.

(b) Strategy formulation and implementation can be distinguished in the following ways:

Strategy Formulation	Strategy Implementation
- It involves the design and choice of appropriate organisational strategies.	- It is the process of putting the various strategies into action of organizations.
- It is positioning forces before the action.	- It is managing forces during the action
- It focuses on effectiveness.	- It focuses on efficiency.
- It is primarily an intellectual process.	- It is primarily an operational process.
- It requires good intuitive and analytical skills.	- It requires special motivation and leadership skills.
- It requires coordination among a few individuals.	- It requires coordination among many individuals.

(c) For implementing six sigma, there are two separate key methodologies for existing and new processes. They are known as DMAIC and DMADV.

DMAIC is an acronym for five different steps used in six sigma - Define, Measure, Analyze Improve, and control. DMAIC methodology is directed towards improvement of existing product, process or service.

- **Define:** To begin with six sigma experts define the process improvement goals that are consistent with the strategy of the organization and customer demands. They discuss different issues with the senior managers so as to define what needs to done.

- **Measure:** The existing processes are measured to facilitate future comparison. Six sigma experts collect process data by mapping and measuring relevant processes.

- **Analyze:** Verify cause-and-effect relationship between the factors in the processes. Experts need to identify the relationship between the factors. They have to make a comprehensive analysis to identify hidden or not so obvious factor.

- **Improve:** On the basis of the analysis experts make a detailed plan to improve.

- **Control:** Initial trial or pilots are run to establish process capability and transition to production. Afterwards continuously measure the process to ensure that variances are identified and corrected before they result in defects.

DMADV is an acronym for Define, Measure, Analyze, Design, and Verify. DMADV is a strategy for designing new products, processes and services.

- **Define:** As in case of DMAIC six sigma experts have to formally define goals of the design activity that are consistent with strategy of the organization and the demands of the customer.

- **Measure:** Next identify the factors that are critical to quality (CTQs). Measure factors such as product capabilities and production process capability. Also assess the risks involved.

- **Analyze**: Develop and design alternatives. Create high-level design and evaluate to select the best design.

- **Design:** Develop details of design and optimise it. Verify designs may require using techniques such as simulations.

- **Verify**: Verify designs through simulations or pilot runs. Verified and implemented processes are handed over to the process owners.

However, in spite of different orientation in two methodologies, conceptually there is overlapping between the DMAIC and DMADV as both are essentially having similar objectives.

(d) **Top-Down and Bottom-Up Strategic Planning:** Strategic planning determines where an organization is going over the next year or more and the ways for going there. The process is organization-wide, or focused on a major function such as a division or other major function. As such strategic planning is a top level management function. The flow of planning can be from corporate to divisional level or vice-versa. There are two approaches for strategic planning - top down or bottom up.

Top down strategic planning describes a centralized approach to strategy formulation in which the corporate centre or head office determines mission, strategic intent, objectives and strategies for the organization as a whole and for all parts. Unit managers are seen as implementers of pre-specified corporate strategies.

Bottom up strategic planning is the characteristic of autonomous or semi-autonomous divisions or subsidiary companies in which the corporate centre does not conceptualize its strategic role as being directly responsible for determining the mission, objectives, or strategies of its operational activities. It may prefer to act as a catalyst and facilitator, keeping things reasonably simple and confining itself to perspective and broader strategic intent.

3.　(a)　Socio-cultural environment consist of factors related to human relationships and the impact of social attitudes and cultural values which has bearing on the business of the organization. The beliefs, values and norms of a society determine how individuals and organizations should be interrelated. The core beliefs of a particular society tend to be persistent. It is difficult for businesses to change these core values, which becomes a determinant of its functioning.

　　　(b)　Portfolio analysis can be defined as a set of techniques that help strategists in taking strategic decisions with regard to individual products or businesses in a firm's portfolio. It is primarily used for competitive analysis and corporate strategic planning in multi product and multi business firms.

　　　(c)　Augmented marketing refers to deliberate and accelerated efforts to get better marketing returns through additional means. It includes provision of additional customer services and benefits built around the care and actual products that relate to introduction of hi-tech services like movies on demand, on-line computer repair services, secretarial services, etc. Such innovative offerings provide a set of benefits that promise to elevate customer service to unprecedented levels.

　　　(d)　Six Sigma is a highly disciplined process that helps in developing and delivering near-perfect products and services. It strives to meet and improve organizational outputs in terms of quality, cost, scheduling, manpower, new products and so on. It works continuously towards revising the current standards and establishing higher ones. It means taking systemic and integrated efforts toward improving quality and reducing cost.

　　　(e)　Strategic groups are conceptually defined clusters of competitors that share similar strategies and therefore compete more directly with one another than with other firms in the same industry. Strong economic compulsions often constrain these firms from switching one competitive posture to another. Any industry contains only one strategic group when all firms essentially have identical strategies and have comparable market positions. At the other extreme, there are as many strategic groups as there are competitors when each rival pursues a distinctively different competitive approach and occupies a substantially different competitive position in the market place.

4.　(a)　A strategy is formed on the basis of certain assumptions or premises about the complex and turbulent organizational environment. Over a period of time these premises may not remain valid.　Premise control is a tool for systematic and continuous monitoring of the environment to verify the validity and accuracy of the premises on which the strategy has been built. It primarily involves monitoring two types of factors:

　　　　　(i)　Environmental factors such as economic (inflation, liquidity, interest rates), technological, social, legal and regulatory factors.

(ii)   Industry factors such as competitors, suppliers, substitutes.

It is neither feasible nor desirable to control all types of premises in the same manner. Different premises may require different amount of control. Thus, managers are required to select those premises that are likely to change and would severely impact the functioning of the organization and its strategy.

(b)   **Total Quality Management:** TQM or Total Quality Management is a people-focused management system that aims at continual increase in customer satisfaction at continually lower real cost. There is a sustained management commitment to quality and everyone in the organisation and the supply chain is responsible for preventing rather than detecting defects.

TQM is a total system approach (not a separate area or program) and an integral part of high-level strategy. It works horizontally across functions and departments, involves all employees, top to bottom, and extends backward and forward to include the supply chain and the customer chain. TQM stresses learning and adaptation to continual change as keys to organizational success.

(c)   **Concept of Strategic Intent:** A company exhibits strategic intent when it relentlessly pursues an ambitious strategic objective and concentrates its full resources and competitive actions on achieving that objective. A company's objectives sometimes play an other role – that of signaling unmistakable strategic intent to make quantum gains in competing against key rivals and establish itself as a clear-cut winner in the marketplace, often against long odds. A company's strategic intent can entail becoming the dominant company in the industry, unseating the existing industry leader, delivering the best customer service of any company in the industry (or the world), or turning a new technology into products capable of changing the way people work and live. Ambitious companies almost invariably begin with strategic intents that are out of proportion to their immediate capabilities and market positions. They set aggressive objectives and pursue them relentlessly, sometimes even obsessively.
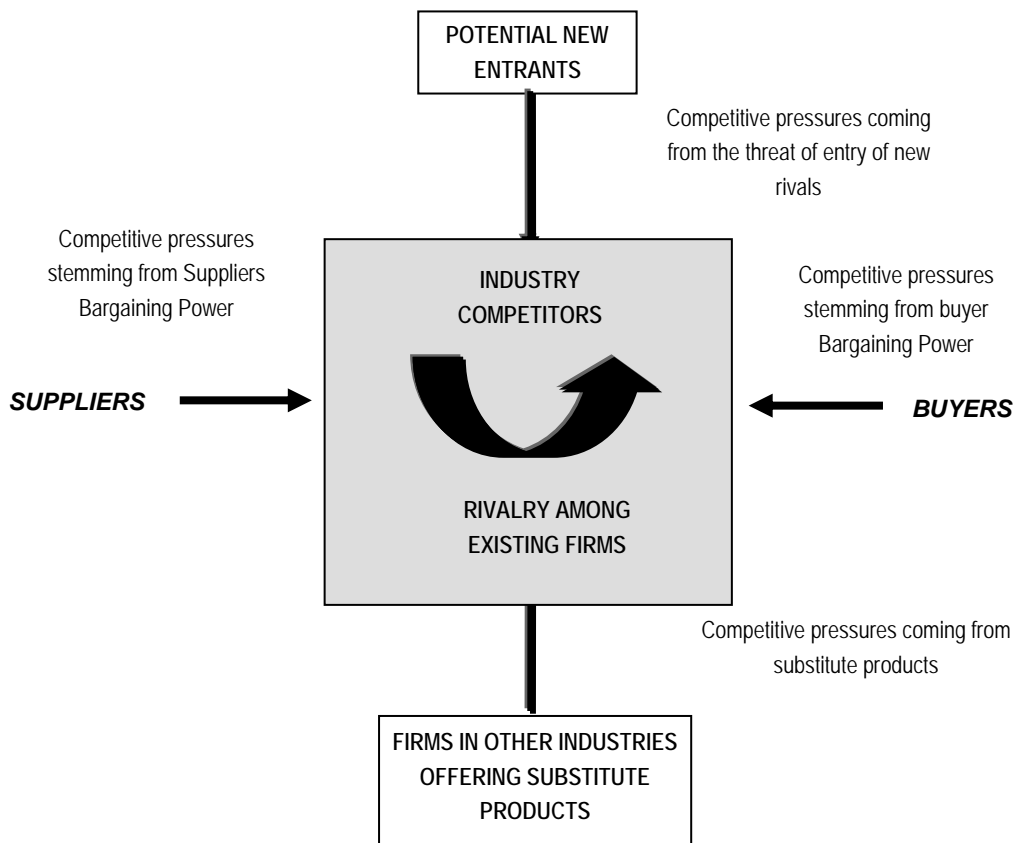
(d)   **Forward Linkages:** The different elements in strategy formulation starting with objective setting through environmental and organizational appraisal, strategic alternatives and choice to the strategic plan determine the course that an organization adopts for itself. With the formulation of new strategies, or reformulation of existing strategies, many changes have to be effected within the organization. For instance, the organizational structure has to undergo a change in the light of the requirements of the modified or new strategy. The style of leadership has to be adapted to the needs of the modified or new strategies. In this way, the formulation of strategies has forward linkages with their implementation.

Backward Linkages: Just as implementation is determined by the formulation of strategies, the formulation process is also affected by factors related with 'implementation. While dealing with strategic choice, remember that past strategic

actions also determine the choice of strategy. Organizations tend to adopt those strategies which can be implemented with the help of the present structure of resources combined with some additional efforts. Such incremental changes, over a period of time, take the organization from where it is to where it wishes to be.

(e) Competitive advantage is position of a firm to maintain and sustain a favorable market position when compared to the competitors. Competitive advantage is ability to offer buyers something different and thereby providing more value for the money. It is the result of a successful strategy. This position gets translated into higher market share, higher profits when compared to those that are obtained by competitors operating in the same industry. Competitive advantage may also be in the form of low cost relationship in the industry or being unique in the industry along dimensions that are widely valued by the customers in particular and the society at large.

5. Five forces model of Michael Porter is a powerful and widely used tool for systematically diagnosing the significant competitive pressures in the market and assessing their strength and importance. The model holds that the state of competition in an industry is a composite of competitive pressures operating in five areas of the over all market. These five forces are:

1. **Threat of new entrants:** New entrants are a powerful source of competition. The new capacity and product range they bring in throw up new competitive pressures. The bigger the new entrant, the more severe the competitive effect. New entrants also place a limit on prices and affect the profitability of existing players.

2. **Bargaining power of customers:** This is another force that influences the competitive condition of the industry. This force will become heavier depending on the possibilities of the buyers forming groups or cartels. The bargaining power of the buyers influences not only the prices that the producer can charge but also influences in many cases, costs and investments of the producer because powerful buyers usually bargain for better services which involve costs and investment on the part of the producer.

3. **Bargaining power of suppliers:** Quite often suppliers, too, exercise considerable bargaining power. The more specialised the offering from the supplier, greater is his clout. And, if the suppliers are also limited in number they stand a still better chance to exhibit their bargaining power. The bargaining power of suppliers determines the cost of raw materials and other inputs of the industry and, therefore, industry attractiveness and profitability.

4. **Rivalry among current players:** The rivalry among existing players is quite obvious. This is what is normally understood as competition. For any player, the competitors influence strategic decisions at different strategic levels. The impact is evident more at functional level in the prices being changed, advertising, and pressures on costs, product and so on.

5. **Threats from substitutes:** Substitute products are a latent source of competition in an industry. In many cases they become a major constituent of competition. Substitute products offering a price advantage and/or performance improvement to the consumer can drastically alter the competitive character of an industry. And they can bring it about all of a sudden. For example, coir suffered at the hands of synthetic fibre. Wherever substantial investment in R&D is taking place, threats from substitute products can be expected.

```
                        ┌─────────────────┐
                        │  POTENTIAL NEW  │
                        │     ENTRANTS    │
                        └─────────────────┘
                                                 Competitive pressures coming
                                                  from the threat of entry of new
                                                            rivals

 Competitive pressures          ┌──────────────────────┐        Competitive pressures
 stemming from Suppliers        │  INDUSTRY            │        stemming from buyer
   Bargaining Power             │  COMPETITORS        │          Bargaining Power

 SUPPLIERS  ───────────▶        │                      │  ◀─────────── BUYERS

                                │  RIVALRY AMONG       │
                                │  EXISTING FIRMS      │
                                └──────────────────────┘
                                                      Competitive pressures coming from
                                                            substitute products

                        ┌──────────────────────────────┐
                        │  FIRMS IN OTHER INDUSTRIES    │
                        │  OFFERING SUBSTITUTE          │
                        │  PRODUCTS                     │
                        └──────────────────────────────┘
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6. Macro environment is explained as one which is largely external to the enterprise and thus beyond the direct influence and control of the organization, but which exerts powerful influence over its functioning. Important elements of macro environment are:

    *   **Demographic Environment:** The term demographics denote characteristics of population in an area, district, country or in world. Some of the demographic factors have great impact on the business. Factors such as general age profile, sex ratio, income, education, growth rate affect the business with different magnitude.

    *   **Economic Environment:** The economic environment refers to the nature and direction of the economy in which a company competes or may compete. The

economic environment includes general economic situation in the region and the nation, conditions in resource markets (money, manpower, raw material and so on) which influence the supply of inputs to the enterprise, their costs, quality, availability and reliability of supplies.

- **Political-Legal Environment:** There are three important elements in political-legal environment:

  ➢ **Government:** Business is highly guided and controlled by government policies. Hence the type of government running a country is a powerful influence on business.

  ➢ **Legal:** Business organizations prefer to operate within a sound legal system. Legal environment consists of laws governing business.

  ➢ **Political:** Political pressure groups influence and limit organizations. Apart from sporadic movements against certain products, service and organizations, politics has deeply seeped into unions.

- **Socio-Cultural Environment:** Socio-cultural environment consist of factors related to human relationships and the impact of social attitudes and cultural values which has bearing on the business of the organization. The beliefs, values and norms of a society determine how individuals and organizations should be interrelated.

- **Technological Environment:** Technology can act as both opportunity and threat to a business. It can act as opportunity as business can take advantage of adopting technological innovations to their strategic advantage. However, at the same time technology can act as threat if organisations are not able to adopt it to their advantage.

- **Global Environment:** In simple economic terms, globalization refers to the process of integration of the world into one huge market. At the company level, globalization means two things: (a) the company commits itself heavily with several manufacturing locations around the world and offers products in several diversified industries, and (b) it also means ability to compete in domestic markets with foreign competitors.

7. In a highly competitive marketplace, companies can operate successfully by creating and delivering superior value to target customers and also learning how to adapt to a continuously changing business environment. Strategic management starts with developing a company mission (to give it direction), objectives and goals (to give it means and methods for accomplishing its mission), business portfolio (to allow management to utilise all facets of the organisation), and functional plans (plans to carry out daily operations from the different functional disciplines).

The overall objective of strategic management is two fold:

(1) To create competitive advantage, so that the company can outperform the competitors in order to have dominance over the market.

(2)   To guide the company successfully through all changes in the environment.

The following are the benefits of strategic approach to managing:

- Strategic management helps organisations to be more proactive instead of reactive in shaping its future. Organisations are able to analyse and take actions instead of being mere spectators. Thereby they are able to control there own destiny in a better manner. It helps them in working within vagaries of environment and shaping it, instead of getting carried away by its turbulence or uncertainties.

- Strategic management provides framework for all the major business decisions of an enterprise such as decisions on businesses, products, markets, manufacturing facilities, investments and organisational structure. It provides better guidance to entire organisation on the crucial point - what it is trying to do.

- Strategic management is concerned with ensuring a good future for the firm. It seeks to prepare the corporation to face the future and act as pathfinder to various business opportunities. Organisations are able to identify the available opportunities and identify ways and means as how to reach them.

- Strategic management serves as a corporate defence mechanism against mistakes and pitfalls. It help organisations to avoid costly mistakes in product market choices or investments. Over a period of time strategic management helps organisation to evolve certain core competencies and competitive advantages that assist in its fight for survival and growth.

8. Strategic decisions are different in nature than all other decisions which are taken at various levels of the organization during day-to-day working of the organizations. The major dimensions of strategic decisions are given below:

- *Strategic issues require top-management decisions*: Strategic issues involve thinking in totality of the organizations and also there is lot of risk involved. Hence, problems calling for strategic decisions require to be considered by top management.

- *Strategic issues involve the allocation of large amounts of company resources*: It may require huge financial investment to venture into a new area of business or the organization may require huge number of manpower with new set of skills in them.

- *Strategic issues are likely to have a significant impact on the long term prosperity of the firm*: Generally the results of strategic implementation are seen on a long term basis and not immediately.

- *Strategic issues are future oriented*: Strategic thinking involves predicting the future environmental conditions and how to orient for the changed conditions.

- *Strategic issues usually have major multifunctional or multi-business consequences:* As they involve organization in totality they affect different sections of the organization with varying degree.

- *Strategic issues necessitate consideration of factors in the firm's external environment:* Strategic focus in organization involves orienting its internal environment to the changes of external environment.

9. Through SWOT analysis organisations identify their strengths, weaknesses, opportunities and threats. While conducting the SWOT Analysis managers are often not able to come to terms with the strategic choices that the outcomes demand. Heinz Weihrich developed a matrix called TOWS matrix by matching strengths and weaknesses of an organization with the external opportunities and threats. The incremental benefit of the TOWS matrix lies in systematically identifying relationships between these factors and selecting strategies on their basis. Thus TOWS matrix has a wider scope when compared to SWOT analysis. TOWS analysis is an action tool whereas SWOT analysis is a planning tool. The matrix is outlined below:

Internal elements ⟍ External Elements	Organizational Strengths	Organizational Weaknesses
	Strategic Options	
Environmental opportunities(and risks)	SO : Maxi – Maxi	WO : Mini – Maxi
Environmental threats	ST : Maxi – Mini	WT : Mini – Mini

Figure: The TOWS Matrix (Source: Weihrich, H)

The TOWS Matrix is a relatively simple tool for generating strategic options. Through TOWS matrix four distinct alternative kinds of strategic choices can be identified.

SO(Maxi-Maxi): SO is a position that any firm would like to achieve. The strengths can be used to capitalize or build upon existing or emerging opportunities. Such firms can take lead from their strengths and utilize the resources to take the competitive advantage.

ST(Maxi-Mini): ST is a position in which a firm strives to minimize existing or emerging threats through its strengths.

WO(Mini-Maxi): The strategies developed need to overcome organizational weaknesses if existing or emerging opportunities are to be exploited to maximum.

WT(Mini-Mini): WT is a position that any firm will try to avoid. An organization facing external threats and internal weaknesses may have to struggle for its survival. WT strategy is a strategy which is pursued to minimize or overcome weaknesses and as far as possible, cope with existing or emerging threats.

By using TOWS Matrix, one can look intelligently at how one can best take advantage of the opportunities open to him, at the same time that one can minimize the impact of weaknesses and protect oneself against threats. Used after detailed analysis of threats,

opportunities, strength and weaknesses, it helps one to consider how to use the external environment to strategic advantage, and so one can identify some of the strategic options that are available.

10. The BCG growth-share matrix is the simplest way to portray a corporation's portfolio of investments. Growth share matrix also known for its cow and dog metaphors is popularly used for resource allocation in a diversified company. Using the BCG approach, a company classifies its different businesses on a two-dimensional growth-share matrix. In the matrix:

- The vertical axis represents market growth rate and provides a measure of market attractiveness.

- The horizontal axis represents relative market share and serves as a measure of company strength in the market.

Using the matrix, organisations can identify four different types of products or SBU as follows:

- **Stars** are products or SBUs that are growing rapidly. They also need heavy investment to maintain their position and finance their rapid growth potential. They represent best opportunities for expansion.

- **Cash Cows** are low-growth, high market share businesses or products. They generate cash and have low costs. They are established, successful, and need less investment to maintain their market share. In long run when the growth rate slows down, stars become cash cows.
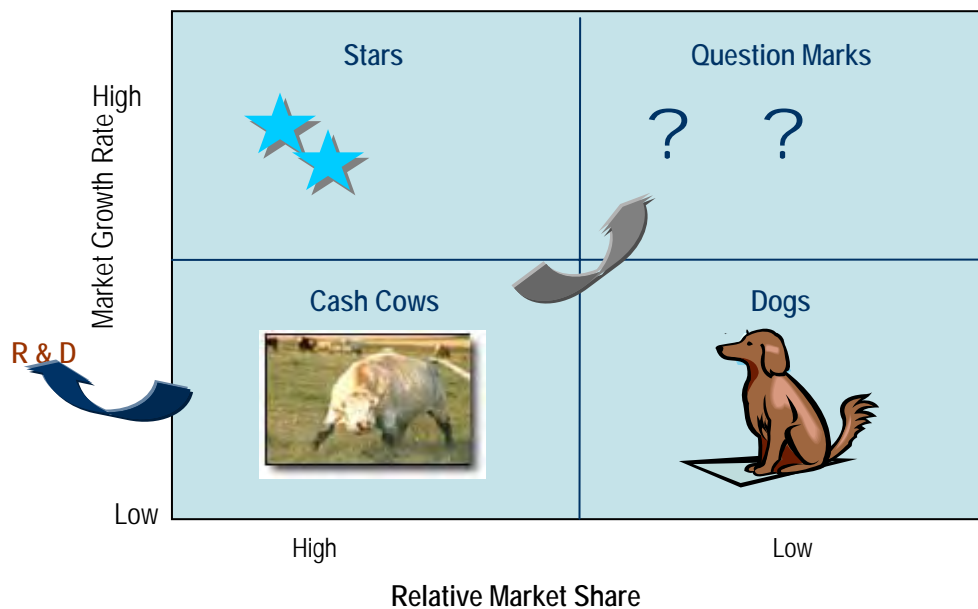

Figure: BCG Growth-Share Matrix

- **Question Marks,** sometimescalled problem children or wildcats, are low market share business in high-growth markets. They require a lot of cash to hold their share. They need heavy investments with low potential to generate cash. Question marks if left unattended are capable of becoming cash traps. Since growth rate is high, increasing it should be relatively easier. It is for business organisations to turn them stars and then to cash cows when the growth rate reduces.

- **Dogs** are low-growth, low-share businesses and products. They may generate enough cash to maintain themselves, but do not have much future. Sometimes they may need cash to survive. Dogs should be minimised by means of divestment or liquidation.

  Once the organisations have classified its products or SBUs, it must determine what role each will play in the future. The four strategies that can be pursued are:

  (i) **Build:** Here the objective is to increase market share, even by forgoing short-term earnings in favour of building a strong future with large market share.

  (ii) **Hold:** Here the objective is to preserve market share.

  (iii) **Harvest:** Here the objective is to increase short-term cash flow regardless of long-term effect.

  (iv) **Divest:** Here the objective is to sell or liquidate the business because resources can be better used elsewhere.

  The growth-share matrix has done much to help strategic planning study; however, there are problems and limitations with the method. BCG matrix can be difficult, time-consuming, and costly to implement. Management may find it difficult to define SBUs and measure market share and growth. It also focuses on classifying current businesses but provide little advice for future planning. They can lead the company to placing too much emphasis on market-share growth or growth through entry into attractive new markets. This can cause unwise expansion into hot, new, risky ventures or giving up on established units too quickly.

11. Turnaround Management is the formulation and implementation of a strategic plan and a set of actions aimed towards corporate renewal and restructuring, during times of severe distress. Rising competition, business cycles and economic volatility create a climate where no business can take viability for granted. Turnaround strategy is a highly targeted effort to return an organization to profitability and increase positive cash flows to a sufficient level. Turnaround strategy is used when both threats and weaknesses adversely affect the health of an organization so much that its basic survival is a question. When organization is facing both internal and external pressures making things difficult then it has to find something which is entirely new, innovative and different. Through turnaround the organization's first objective is to survive and then grow in the market. Once turnaround is successful the organization may turn to focus on growth.

Action plan for turnaround strategy

(i) **Assessment of current problems:** The first step is to assess the current problems and get to the root causes and the extent of damage the problem has caused. Once the problems are identified, the resources should be focused toward those areas essential to efficiently work on correcting and repairing any immediate issues.

(ii) **Analyze the situation and develop a strategic plan:** Before making any major changes, chances of survival may be ascertained. Identify appropriate strategies and develop a preliminary action plan. For this one should look for the viable core businesses, adequate bridge financing and available organizational resources. Once major problems and opportunities are identified, develop a strategic plan with specific goals and detailed functional actions.

(iii) **Implementing an emergency action plan:** If the organization is in a critical stage, an appropriate action plan must be developed to stop the bleeding and enable the organization to survive. The plan typically includes human resource, financial, marketing and operations actions to restructure debts, improve working capital, reduce costs, improve budgeting practices, prune product lines and accelerate high potential products. A positive operating cash flow must be established as quickly as possible and raise enough funds to implement the turnaround strategies.

(iv) **Restructuring the business:** The financial state of the organization's core business is particularly important. If the core business is irreparably damaged, then the outlook for the entire organization may be bleak. Prepare cash forecasts, analyze assets and debts, review profits and analyze other key financial functions to position the organization for rapid improvement.

During the turnaround, the "product mix" may be changed, requiring the organization to do some repositioning. Core products neglected over time may require immediate attention to remain competitive. Some facilities might be closed. Organizations may even withdraw from certain markets. The 'people mix' is another important ingredient in the organization's competitive effectiveness. Reward and compensation systems that encourage dedication and creativity encourage employees to think profits and return on investments.

(v) **Returning to normal:** In the final stage of turnaround strategy process, the organization should begin to show signs of profitability, return on investments and enhancing economic value-added. Emphasis is placed on a number of strategic efforts to take the organisation on growth path.

12. According to Porter, strategies allow organizations to gain competitive advantage from three different bases: cost leadership, differentiation, and focus. Porter calls these base generic strategies. Cost leadership emphasizes producing standardized products at a very low per-unit cost for consumers who are price-sensitive. Differentiation is a strategy aimed at producing products and services considered unique industry wide and directed

at consumers who are relatively price-insensitive. Focus means producing products and services that fulfill the needs of small groups of consumers.
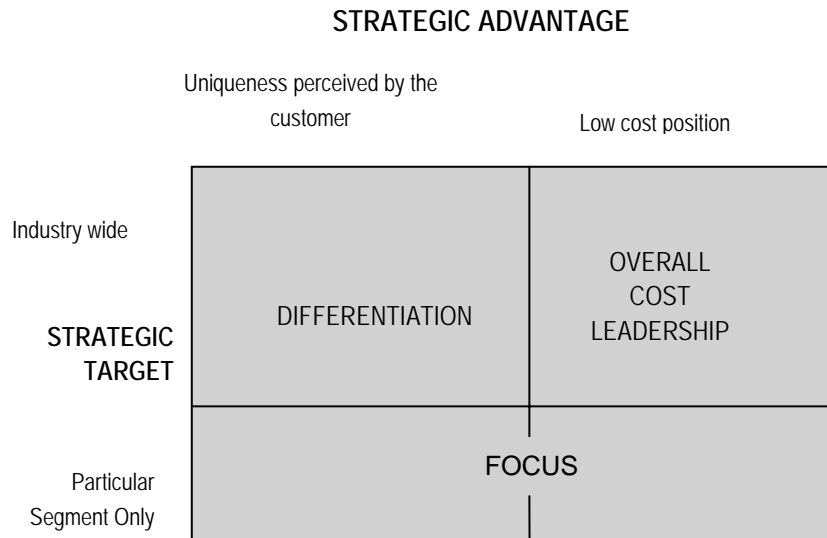
STRATEGIC ADVANTAGE

	Uniqueness perceived by the customer	Low cost position
Industry wide	DIFFERENTIATION	OVERALL COST LEADERSHIP
Particular Segment Only	FOCUS	

STRATEGIC TARGET

Figure: Michael Porter's Generic Strategy

Cost Leadership Strategies: A primary reason for pursuing forward, backward, and horizontal integration strategies is to gain cost leadership benefits. But cost leadership generally must be pursued in conjunction with differentiation. A number of cost elements affect the relative attractiveness of generic strategies, including economies or diseconomies of scale achieved, capacity utilization and linkages with suppliers and distributors and so on.

Differentiation Strategies: Different strategies offer different degrees of differentiation. A differentiation strategy should be pursued only after a careful study of buyers' needs and preferences to determine the feasibility of incorporating one or more differentiating features into a unique product that features the desired attributes. A successful differentiation strategy allows a firm to charge a higher price for its product and to gain customer loyalty. Special features that differentiate one's product can include superior service, spare parts availability, design, product performance, useful life, or ease of use and so on.

Focus Strategies: A successful focus strategy depends on an industry segment that is of sufficient size, has good growth potential, and is not crucial to the success of other major competitors. Strategies such as market penetration and market development offer substantial focusing advantages. Midsize and large firms can effectively pursue focus-based strategies only in conjunction with differentiation or cost leadership-based strategies. All firms in essence follow a differentiated strategy.

13. The term supply chain refers to the linkages between suppliers, manufacturers and customers. Supply chains involve all activities like sourcing and procurement of material, conversion, and logistics. Planning and control of supply chains are important components of its management. Naturally, management of supply chains include closely working with channel partners – suppliers, intermediaries, other service providers and customers.

Supply chain management is defined as the process of planning, implementing, and controlling the supply chain operations. It is a cross-functional approach to managing the movement of raw materials into an organization and the movement of finished goods out of the organization toward the end-consumer who are to be satisfied as efficiently as possible.

Is logistic management same as supply chain management?

Supply chain management is an extension of logistic management. However, there is difference between the two. Logistical activities typically include management of inbound and outbound goods, transportation, warehousing, handling of material, fulfilment of orders, inventory management, supply/demand planning. Although these activities also form part of Supply chain management, the latter has different components. Supply chain management includes more aspects apart from the logistics function. It involves working cohesively with the channel partners to streamline the flow of materials. It is a tool of business transformation and involves delivering the right product at the right time to the right place and at the right price. It reduces costs of organizations and enhances customer service.

14. The financial strategies of an organization are related to several finance/ accounting concepts considered to be central to strategy implementation. These are: acquiring needed capital/sources of fund, developing projected financial statements/budgets, management/ usage of funds, and evaluating the worth of a business.

Various methods for determining a business's worth can be grouped into three main approaches which are as follows:

(i)   Net worth or stockholders' equity: Net worth is the total assets minus total outside liabilities of an individual or a company.

(ii) Future benefits to owners through net profits: These benefits are considered to be much greater than the amount of profits. A conservative rule of thumb is to establish a business's worth as five times the firm's current annual profit. A five-year average profit level could also be used.

(iii) Market-determined business worth: This, in turn, involves three methods. First, the firm's worth may be based on the selling price of a similar company. The second approach is called the price-earnings ratio method whereby the market price of the firm's equity shares is divided by the annual earnings per share and multiplied by the firm's average net income for the preceding years. The third approach can be

called the outstanding shares method whereby one has to simply multiply the number of shares outstanding by the market price per share and add a premium.

15. In the recent years information technology and communications have significantly altered the functioning of organizations. The role played by middle management is diminishing as the tasks performed by them are increasingly being replaced by the technological tools. Hourglass organization structure consists of three layers with constricted middle layer. The structure has a short and narrow middle-management level. Information technology links the top and bottom levels in the organization taking away many tasks that are performed by the middle level managers. A shrunken middle layer coordinates diverse lower level activities. Contrary to traditional middle level managers who are often specialist, the managers in the hourglass structure are generalists and perform wide variety of tasks. They would be handling cross-functional issues emanating such as those from marketing, finance or production.
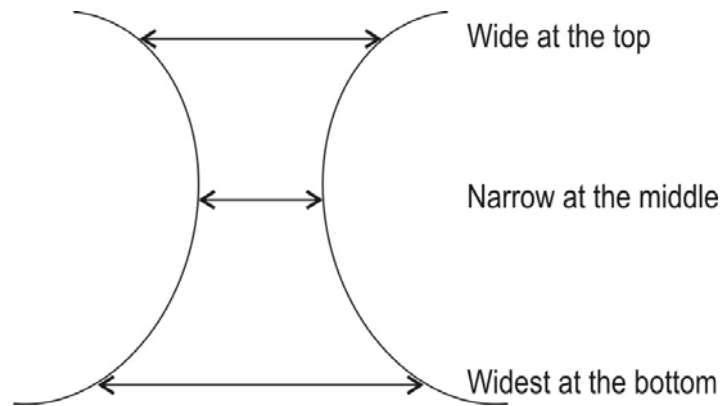

Figure: Hourglass Organisation Structure

Hourglass structure has obvious benefit of reduced costs. It also helps in enhancing responsiveness by simplifying decision making. Decision making authority is shifted close to the source of information so that it is faster. However, with the reduced size of middle management the promotion opportunities for the lower levels diminish significantly. Continuity at same level may bring monotony and lack of interest and it becomes difficult to keep the motivation levels high. Organisations try to overcome these problems by assigning challenging tasks, transferring laterally and having a system of proper rewards for performance.

16. The phenomenon which often distinguishes good organizations from bad ones could be summed up as 'corporate culture'. Corporate culture refers to a company's values, beliefs, business principles, traditions, ways of operating and internal work environment. Every corporation has a culture that exerts powerful influences on the behaviour of managers. Culture affects not only the way managers behave within an organization but also the decisions they make about the organization's relationships with its environment and its strategy.

"Culture is a strength that can also be a weakness". This statement can be explained by splitting it in to two parts.

Culture as a strength: As a strength, culture can facilitate communication, decision-making & control and create cooperation & commitment. An organization's culture could be strong and cohesive when it conducts its business according to a clear and explicit set of principles and values, which the management devotes considerable time to communicating to employees and which values are shared widely across the organization.

Culture as a weakness: As a weakness, culture may obstruct the smooth implementation of strategy by creating resistance to change. An organization's culture could be characterized as weak when many subcultures exist, few values and behavioral norms are shared and traditions are rare. In such organizations, employees do not have a sense of commitment, loyalty and sense of identity.

17. In simple words, benchmarking is an approach of setting goals and measuring productivity based on best industry practices. It developed out of need to have information against which performances can be measured. For example, a customer support engineer of a television manufacturer attends a call within forty-eight hours. If the industry norm is that all calls are attended within twenty-four hours, then the twenty-four hours can be a benchmark.

    Benchmarking helps in improving performance by learning from best practices and the processes by which they are achieved. It involves regularly comparing different aspects of performance with the best practices, identifying gaps and finding out novel methods to not only reduce the gaps but to improve the situations so that the gaps are positive for the organization. Benchmarking can help in almost all aspect of business that are amenable to comparison and are significant to business. Typically organisations can use benchmarking process to achieve improvement in diverse range of management function like:

    ♦ Maintenance operations

    ♦ Assessment of total manufacturing costs

    ♦ Product development

    ♦ Product distribution

    ♦ Customer services

    ♦ Plant utilization levels

    ♦ Human resource management

18. Business Process Reengineering (BPR) is an approach to unusual improvement in operating effectiveness through the redesigning of critical business processes and supporting business systems. It is revolutionary redesign of key business processes that

involves examination of the basic process itself. It looks at the minute details of the process, such as why the work is done, who does it, where is it done and when it is done. BPR refers to the analysis and redesign of workflows and processes both within the organization and between the organization and the external entities like suppliers, distributors, and service providers.

The orientation of redesigning efforts is basically radical. In other words, it is a total deconstruction and rethinking of business process in its entirety, unconstrained by its existing structure and pattern. Its objective is to obtain quantum jump in process performance in terms of time, cost, output, quality, and responsiveness to customers. BPR is a revolutionary redesigning of key business processes.

BPR involves the following steps:

1. **Determining objectives and framework:** Objectives are the desired end results of the redesign process which the management and organization attempts to achieve. This will provide the required focus, direction, and motivation for the redesign process. It helps in building a comprehensive foundation for the reengineering process.

2. **Identify customers and determine their needs***:* The designers have to understand customers – their profile, their steps in acquiring, using and disposing a product. The purpose is to redesign business process that clearly provides added value to the customer.

3. **Study the existing process:** The existing processes will provide an important base for the redesigners. The purpose is to gain an understanding of the 'what', and 'why' of the targeted process. However, some companies go through the reengineering process with clean perspective without laying emphasis on the past processes.

4. **Formulate a redesign process plan:** The information gained through the earlier steps is translated into an ideal redesign process. Formulation of redesign plan is the real crux of the reengineering efforts. Customer focused redesign concepts are identified and formulated. In this step alternative processes are considered and the best is selected.

5. **Implement the redesign:** It is easier to formulate new process than to implement them. Implementation of the redesigned process and application of other knowledge gained from the previous steps is key to achieve dramatic improvements. It is the joint responsibility of the designers and management to operationalise the new process.