



Guideline Answers for Information Technology and Strategic Management

Section–A Question 1 is compulsory. Answer any 5 Questions from the remaining questions.

1. Answer all the following questions in brief: (2 × 5 = 10 Marks)

(a) Network Interface Card (NIC)	Network Interface Card (NIC): Network Interface Card constructs, transmits, receives, and processes data to and from a host to network. Each NIC has 8 bytes permanent and unique MAC (Media Access Control) address which is known as Physical Address and is provided by the manufacturer.
(b) Site Blocking,	Site Blocking: (a) Site Blocking is a software–based approach, which prohibits access to certain web–sites that are deemed inappropriate by Management. (b) In addition to blocking sites, Companies can also log activities and determines the amount of item spent on the Internet and identifies the sites visited.
(c) IDS Technologies.	IDS Technologies: (a) An Intrusion Detection System (IDS) is a device or software application that monitors network or system activities for malicious activities or policy violations and produces reports for appropriate action by Management. (b) IDS monitors network assets to detect anomalous behaviour and misuse. (c) IDS Technologies include the following – <ul style="list-style-type: none"> • Network Intrusion Detection (NID) • Host–based Intrusion Detection (HID) • Hybrid Intrusion Detection\ • Network–Node Intrusion Detection (NNID)
(d) Cryptography	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. i.e. plaint text converted into Cipher text.
(e) Primary Memory	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).

2. (a) Discuss the different cycles of an Account Business Process Management. (Any 4 points) (4 Marks)

The processing cycles of an Accounts Business Process Management are namely Financing Cycle, Revenue Cycle, Expenditure Cycle, Human Resource and the General Ledger & Reporting Systems and the flow of data between them. These systems are discussed as follows:

- (i) **Financing Cycle:** A transaction processing cycle combines one or more types of transactions having related features or similar objectives. The cycle consists of a set of transactions leading to the recognition of a major economic event on the financial statements. It is through the study of transaction cycles that we gain a clear view of a firm's processing framework.
- (ii) **Revenue Cycle:** It includes transactions surrounding the recognition of revenue involving accounts like Sales, Accounts Receivable, Inventory and General Ledger. It involves capturing and recording of customer orders; shipment of the goods; recording of the cost of goods sold; the billing process and the recording of sales and accounts receivable; and capturing and recording of cash receipts. Common Source Documents & functions of Revenue Cycle are as follows:

Source Document	Function
Sales Order	Record Customer Order
Delivery Ticket	Record Delivery to Customer
Remittance Advice	Receive Cash
Deposit Slip	Record Amounts Deposited



Credit Memo	Support Adjustments to Customer Accounts
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- (iii) **Expenditure Cycle:** It includes transactions surrounding the recognition of expenditures involving accounts like Purchases, Accounts Payable, Cash Disbursements, Inventory and General Ledger. It includes preparation and recording of purchase orders; receipt of goods and the recording of the cost of inventory; receipt of vendor invoices; recording of accounts payable and preparation and recording of cash disbursements. The cycle also includes the preparation of employee pay-checks and the recording of payroll activities. Common Source Documents & functions of Revenue Cycle are as follows:

Source Document	Function
Purchase Requisition	Request that purchasing department order goods.
Purchase Order	Request goods from vendors.
Receiving Report	Record receipt of merchandise.
Check	Pay for items.

- (iv) **Human Resource Cycle:** Common Source Documents & Functions are as follows:

Source Document	Function
W4 forms	Collect employee withholding data.
Time cards	Record time worked by employees.
Job time tickets	Record time spent on specific jobs.

- (v) **General Ledger & Reporting System:** Common Source Document and its function is as follows:

General Ledger and Reporting System	
Journal Voucher	Record entry posted to general ledger.

- (vi) **Data Processing Cycle:** In the Data Processing Cycle, the processes of business activities about which data must be collected and processed are identified. Further, the emphasize could be on the activities, resources affected by that event, the agents who participate in that event; where the event could be the Input, Output, Processing, Storage, Alerts, Controls and Feedback. All the above cycles of processing involves data processing activities which has been updated and stored. The stored information has details about the resources affected by the event and agents who participated in the activity.

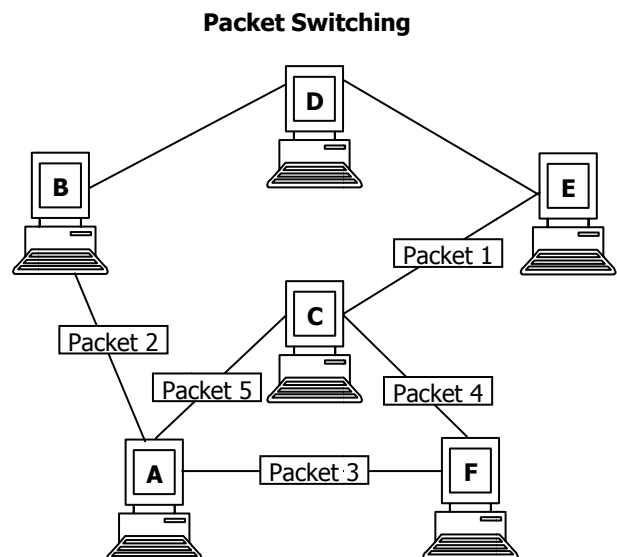
- (b) **Discuss various switching techniques in telecommunication networks. (4 Marks)**

1. **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.
- There is a **dedicated communication path** (i.e. sequence of links) between two stations.
- On each physical link, a Channel is dedicated to the connection.
- The route is dedicated and exclusive, and released only when the communication session terminates.
- Example:** Telephone Network for continuous flow of data.

2. **Packet Switching:**

- Packet Switching is a method of communication between computers in a network in which **blocks of messages** to be transmitted are **formed into Packets** and then placed on the channel.
- Data is divided into blocks called '**Packets**'.
- Each packet is transmitted individually across the Net.
- Each Packet of User Data travels in a data envelope, which gives the destination address of the packet and a variety of control information.
- Each Packet contains source and destination addresses, synchronizing error correction and control bits. The Packets are routed using the source and destination addresses.
- Each switching node in a minicomputer reads the Packet into its memory, examines the address, selects the next node to which it shall transmit the Packet and sends it on its way.
- The Packets may even follow different routes to the destination.





3. **Message Switching:**

- (a) Exchange of logical units of data called **Messages**. **Examples:** Telegrams, Electronic Mail, Computer Files and transaction queries and responses.
- (b) In Message Switching, a **dedicated path** between the two nodes **is not necessary**. If a station wishes to send a message (logical unit of information) it appends a destination address to the message.
- (c) The Message is then passed through the Network from node to node. At each node, the entire message is received, stored briefly and then transmitted to the next node. (**Store and Forward Technique**)
- (d) Electronic Mail (e-mail) and Voice Mail are examples of Message Switching systems.

3. (a) **Discuss Business Intelligence and its tools.**

(4 Marks)

Business Intelligence: Business Intelligence (BI) may be defined as the delivery of accurate, useful information to the appropriate decision makers within the necessary time frame to support effective decision making for business processes. BI is comprised of information that contains patterns, relationships, and trends about customers, suppliers, business partners and employees. BI is essentially timely, accurate, high-value, and actionable business insights, and the work processes and technologies used to obtain them. Business intelligence systems process, store and provide useful information to the user who need it, when they need it. BI can handle large amounts of information to help identify and develop new opportunities. Making use of new opportunities and implementing an effective strategy can provide a competitive market advantage and longterm stability.

Business Intelligence Tools

Business Intelligence tools are a type of software that is designed to retrieve, analyze and report data. Some of the key Business Intelligence tools are given as follows:

- 1. **Simple Reporting and Querying:** This involves using the data warehouse to get response to the query: "Tell me what happened." The objective of a BI implementation is to turn operational data into meaningful knowledge. This requires that BI must be connected with the enterprise data and all the necessary data is available in one place, in one common format. Data warehousing (DW) provides the perfect architecture to combine all the data dispersed throughout the enterprise in different applications in a variety of formats, on a range of hardware, which could be anywhere to be cleaned up, summarized, converted and integrated into one common format and available centrally for further processing. There are reporting tools used to arrange information into a readable format and distribute it to the people who need it.
- 2. **Business Analysis:** This involves using the data to get response to the query: "Tell me what happened and why." Business analysis refers to presenting visualizing data in a multidimensional manner. Business analysis allows the user to plot data in row and column coordinates to further understand the intersecting points. ETL (Extract, Transform, Load) tools bring in data from outside sources, transform it to meet business specified operational needs, and then load the results into the company database. Metadata tools gather and analyze metadata, helping to increase data quality.
- 3. **Dashboards:** This involves using the information gathered from the data warehouse and making it available to users as snapshots of many different things with the objective of getting response to the query: "Tell me a lot of things, but without too much effort". Dashboards are flexible tools that can be bent into as many different shapes as per user requirements. It includes a collection of graphs, reports, and KPIs that can help monitor such business activities as progress on a specific initiative.
- 4. **Scorecards:** This involves providing a visual representation of the enterprise strategy by taking critical metrics and mapping them to strategic goals throughout the enterprise. Scorecards offer a rich, visual gauge to display the performance of specific initiatives, business units, or the enterprise as a whole and the individual goals in the context of larger enterprise strategy. Scorecards distil information into a small number of metrics and targets and provide users with an at a glance perspective of information. A scorecard has a graphical list of specific, attainable strategic milestones, combined with metrics that serve as benchmarks. Specific measures on how well the company has actually performed specified activities are linked in the scorecard with graphical display highlighting the status of each goal.
- 5. **Data Mining or Statistical Analysis:** This involves using statistical, artificial intelligence, and related techniques to mine through large volumes of data and providing knowledge without users even having to ask specific questions. The objective is to provide interesting and useful information to users by design even without their querying. Data Mining involves data analysis for discovering useful patterns that are "hidden" in large volume of diverse data.



(b) Software as a Service (SaaS) and Platform as a Service (PaaS) in Cloud Computing (4 Marks)

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.

4. (a) Discuss Relational Database Model. (4 Marks)

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.

(b) Write a short note on any one of the following: (4 Marks)

(i) Cloud Computing.

1. Cloud Computing is the use of various services, such as Software Development Platforms, Servers, Storage, and Software, over the Internet.
2. Internet is generally visualized as "Clouds". Hence, use of Internet-based computing is called Cloud Computing.

Features of Cloud Computing: (Any two Points)

1. **Scalability / Elasticity:** Databases in Cloud are highly dynamic and scalable to meet differing requirements of Clients.
2. **Reliability / Resiliency:** Cloud Computing is more reliable because of minimal infrastructure failures. When there is a failure of Server and Storage Resources, the work is migrated to a different physical resource in the Cloud with or without user awareness and intervention.
3. **Availability:** Since the Cloud / Internet utilizes the resources, availability of Servers are high. Users can access database resources through the Internet, from any place, for any number of times, etc.
4. **Agility:** The agility (responsiveness) and efficiency of Cloud Computing is high, as the Cloud works in the 'Distributed Mode' environment which **shares** the resources and tasks.
5. **Multi-sharing:** Since the Cloud works in a distributed and shared mode, multiple users and tasks from various applications can work more efficiently.
6. **Multi-Device Access:** Cloud Computing permits secured access to data from any Network-connected Device, e.g. Desktop PC, Notebook, Tablet, Smartphone, etc. The User can use any data or application in the Cloud without confining it to a particular device.
7. **Maintenance:** Installation of Software Applications in the Client's system is not required. Thus, maintenance of Cloud Computing applications is easier.
8. **Virtualization:** This feature allows Servers and Storage Devices to share and utilize applications, by easy migration from one physical Server to another.
9. **Performance:** System Performance and its interface with applications are consistently monitored under Cloud Computing. Loosely-coupled architectures are constructed using web services.



10. **Services in Pay-Per-Use Mode:** Service Level Agreements (SLA's) between the Cloud Service Provider and the User must be clearly defined as billing is based on pay-per-use mode. Application Programming Interfaces (APIs) may be offered to the Users for their access.
11. **On-Demand:** Since the User Entity calls for Cloud Services only when needed, they are not permanent parts of the IT Infrastructure. With Cloud Services, there is no need to have dedicated resources waiting to be used, as is the case with internal services.
12. **Independent:** Cloud Computing is an independent platform. There is no need to procure specific software.
13. **Unlimited Data Storage:** Storing information in the Cloud / Internet leads to almost unlimited storage capacity, with no substantial increase in costs.
14. **Different Cloud Types:** Project Managers can manage projects better by assigning different hardware resources to different cloud types, viz. Web Development Cloud, Testing Cloud and Production Cloud. This will help manage costs, manage security and allocate resources effectively.
15. **Workload Movement:** This characteristic is related to resiliency and cost considerations. Here, Cloud-Computing Providers can migrate workloads across servers both inside the Data Center and across Data Centers (even in a different geographic area). This migration might be necessitated by **cost** factors (e.g. less expensive to run a workload in a data center in another country based on time of day or power requirements) or **efficiency** considerations (e.g. Network Bandwidth), or **regulatory considerations** for certain types of workloads.
16. **Multi Tenancy:** Public Cloud Service Providers often can host the cloud services for multiple users within the same infrastructure. Server and Storage Isolation may be physical or virtual depending upon the specific user requirements.

(ii) Expert System.

1. Meaning:

- (a) An **Expert System** is a highly developed DSS that utilizes knowledge which is generally possessed by an Expert, to solve a problem.
- (b) Thus, Expert Systems are software systems that imitate the reasoning and processes of human experts, and provide decision-makers with the type of advice (along with reasoning therefor) that would be normally received from human Experts.

2. Usefulness:

- (a) Expert Systems are used for complex or ill-structured tasks that require experience and specialized knowledge in narrow, specific subject areas.
- (b) The aim of the expert system is to have a team of seasoned specialists holding industry-wide experience who further spread across implementations.
- (c) Expert Systems are used in areas like Defence, Government, Finance, Telecom, Engineering and Consulting Services Sectors.

5. (a) Discuss multi-tier architecture.

(4 Marks)

Multi-tier Architecture: Multi-tier architecture (often referred to as n-tier architecture) is a client-server architecture in which an application is executed by more than one distinct software agent. For example, an application that uses middleware to service data requests between a user and a database employs multi-tier architecture. The most widespread use of "multi-tier architecture" refers to three-tier architecture.

The client program has only User Interface (UI) code that talks, via a network, to the "middle tier" on which the business and database logic sits which in turn, via a network, talks to the database. In practice the middle tier can be placed, if necessary, on the same machine as the database.

In either architecture, the data "traffic" is highest between database logic and database server. This means that the network infrastructure that connects the database logic with the database server needs to be very high bandwidth; i.e. expensive.

The advantages of a multi-tier architecture are:

- Forced separation of UI and business logic;
- Low bandwidth network;
- Business logic sits on a small number (may be just one) of centralized machines; and
- Enforced separation of UI and business logic.



(b) Discuss Data Centre protection challenges and best practices solutions. (Any 4 points) (4 Marks)

Large enterprise IT managers understand the criticality of data protection challenges and try to mitigate the cost, and complexity of data protection throughout their enterprises — including data centers, disaster recovery sites and branch locations. Some of the top challenges faced by large enterprise IT managers and the best practices for overcoming them are as follows:

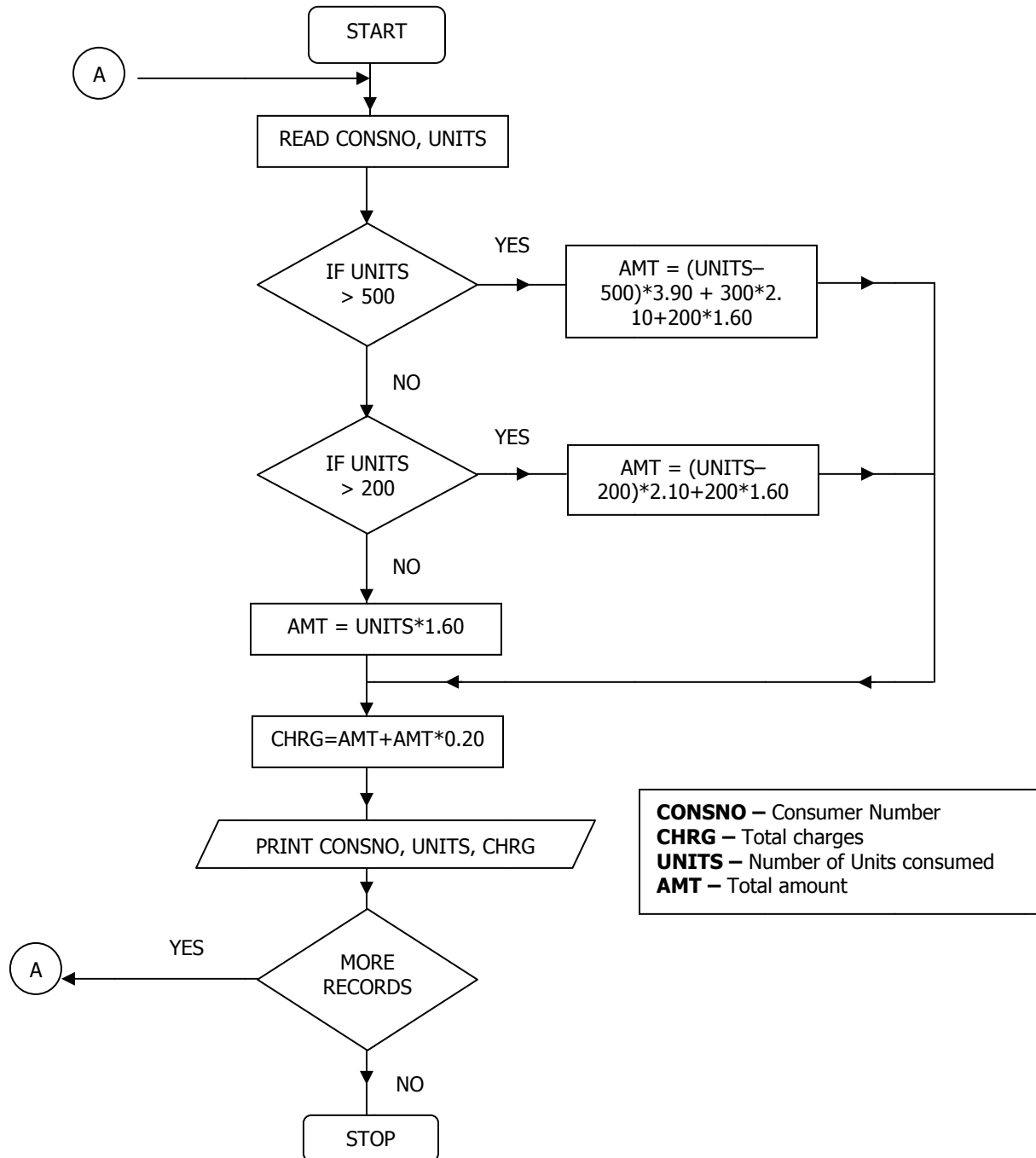
- (i) **Control skyrocketing data growth:** Data growth is the biggest data center hardware infrastructure challenge for large enterprises. Several types of data deduplication technologies help in reducing data storage needs by eliminating redundant data. Data deduplication also reduces the data that must be sent across a WAN for remote backups, network replication, and disaster recovery.
- (ii) **System performance and scalability:** To avoid data center sprawl in the data protection environment, IT managers should look ahead 3-5 years and choose a data protection “target” system that will scale to accommodate the performance and capacity they will need without adding new system images. It also saves money in administration time by eliminating the need to load balance and tune new systems needed for scaling.
- (iii) **Network congestion and connectivity architecture:** The new generation of servers with multi-core processors demands significantly high input/output (I/O), and if these servers are virtualized, this requirement further goes up, which is one of the biggest data center infrastructure challenge. Vendors should help its customers to be strategic with their network infrastructure rather than using the traditional LAN switches that are not designed to meet the sudden upsurge in network demand.
- (iv) **IT administration and staff time at premium:** Data protection IT administrators have more data to protect and more complex data protection standards to meet while staying within a limited budget. They need to invest in systems that automate disk-subsystem management, reduce complexity, and provide effective dashboards and reporting. Minimum requirements for large enterprise data protection platforms include: automatic load balancing and tuning; automatic system monitoring and “phone home” functionality; and providing dashboards and reporting.
- (v) **Inadequate Disaster Recovery plans:** Large enterprises that have been using physical tape backup systems and disparate disk-based solutions in branch offices are particularly vulnerable to downtime and data loss in the event of a disaster. Enterprise IT managers should consider the use of a consistent platform that enables IT staff to manage remote-office backup, deduplication, replication and restore operations from a data center headquarters. It also minimizes the burden on IT administrators in branch locations and provides administrators with a companywide view of data protection efficiency.
- (vi) **Adopting new risk prone, cost-effective data protection technologies:** With limited budgets and resources, IT managers have worked to protect their investment in existing technologies. IT managers should look for enterprise-class data protection solutions that mitigate these costs and risk with features such as robust tape emulation and storage pooling.
- (vii) **Resource balancing:** The enterprise chief technical officer needs to strike a working balance between reduced operational budgets, increased demands on existing infrastructure, maximizing availability, ensuring round-the-clock monitoring and management, and the periodic upgrades that today’s technology demands.

6. (a) An electric supply company charges the following rates for its domestic consumers: (4 Marks)

No. of units consumed	Charges/unit (₹)
For the first 200 units	1.60
For the next 300 units	2.10
Over 500 units	3.90

Surcharge @ 20% of the bill is to be added to the charges.

Draw a Flow chart for the above, which will read the consumer number and the number of units consumed and print out the total charges with the consumer number and the units consumed.



(b) Enumerate the steps involved in Business Process Automation. (Any 4 points)

(4 Marks)

The approach to BPA entails understanding how information is collected and processed on a day-to-day basis, and then making recommendations on how best to automate those processes for maximum benefit. The steps involved in BPA are –

Step	Description
1. Define why BPA is required	The Entity should first define why it plans to implement a BPA. Some common reasons for BPA are – (a) Poor and Deficient Customer Service. (b) Lack of Management understanding of Business Processes. (c) Errors in Manual Processes leading to higher costs.



Step	Description
	<p>(d) Problems in Payment Processes, e.g. duplicate or late payments, missing early pay discounts, paying for goods and services not received, etc.</p> <p>(e) Problems in Collection Processes, e.g. delay in collection, mismatch between cash receipts and payments.</p> <p>(f) Ineffective Document Management, e.g. not being able to find documents quickly during an audit or lawsuit or not being able to find all documents.</p> <p>(g) Unable to recruit and train new employees, but where employees are urgently required.</p>
<p>2. Understand applicable Rules / Regulations</p>	<p>(a) Governance is established by a combination of Internal Corporate Policies, External Industry Regulations and Local, State, and Central Law.</p> <p>(b) The Entity should ensure that any BPA adheres to the requirements of law, particularly in the following areas (illustrative list) –</p> <ul style="list-style-type: none"> (i) Rules and Regulations applicable to the Entity, (ii) Document Retention Requirements (time period and format), (iii) Legal Effect of Transactions, (iv) Audit, Reporting and Compliance Requirements.
<p>3. Document the process, which is to be automated</p>	<p>The following aspects need to be kept in mind while documenting the present process:</p> <ul style="list-style-type: none"> (a) What documents need to be captured? (b) How do the documents originate? (c) What format are they in: Paper, Fax, email, PDF, etc.? (d) Who is involved in processing of the documents? (e) What are the legal aspects on processing of these documents? (f) Can there be a better way to do the same job? (g) How are exceptions in the Process handled? <p>Note: Documentation of present process provides the following benefits –</p> <ul style="list-style-type: none"> (i) provides clarity on the process, (ii) helps to identify sources of inefficiency, bottlenecks, and problems, and (iii) allows to re–design the process better.
<p>4. Define the Objectives / Goals to be achieved by implementing BPA</p>	<p>The Entity should determine the key objectives / goals of the process improvement activities. Goals should have the following attributes (SMART) –</p> <ul style="list-style-type: none"> • Specific, i.e. clearly defined, • Measurable, i.e. quantifiable in monetary terms, • Attainable, i.e. achievable through best efforts, • Relevant, i.e. applicable to the Entity, and • Timely, i.e. to be achieved within a given timeframe.
<p>5. Engage the Business Process Consultant</p>	<p>The choice of BPA Consultant depends on the following factors –</p> <ul style="list-style-type: none"> (a) Objectivity of the Consultant in understanding/evaluating the Entity's situation, (b) Experience of the Consultant – (a) with the Entity's business processes, and (b) generally in resolving critical business issues. (c) Expertise of the Consultant, to clearly articulate the business value of every aspect of the proposed solution. (d) Capability of the Consultant in recommending and implementing a combination of hardware, software and services as appropriate to meeting the Entity's BPA requirements.
<p>6. Compute ROI of BPA Project</p>	<p>Financial Impact of Benefits from BPA include the following –</p> <ul style="list-style-type: none"> (a) Savings in Employee Salary by not having to replace those due to attrition. (b) Cost of Space regained from paper, file cabinets, reduced. (c) Eliminating Fines to be paid by Entity due to delays being avoided. (d) Reducing the cost of audits and lawsuits. (e) Lower Interest Cost and better Cash Flow management by availing early payment discounts, avoiding duplicate payments, collecting Accounts Receivable faster, etc. (f) New Revenue Generation opportunities.



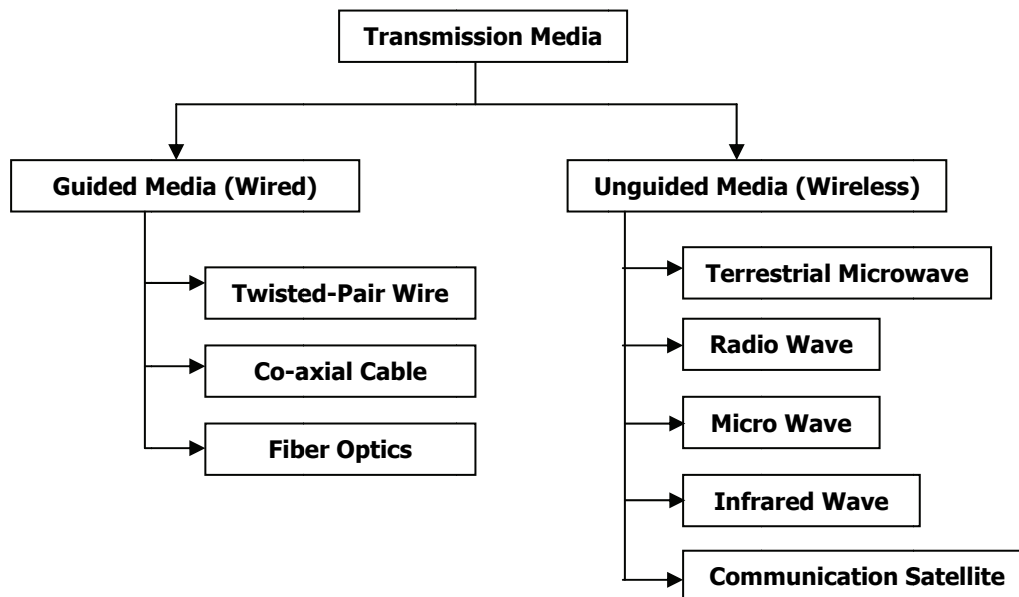
Step	Description
	(g) Revenue by way of charging for instant access to records (e.g. Public Information, Student Transcripts, Medical Records, etc.) (h) Building business by providing superior levels of customer service, higher goodwill, etc. For Senior Management's decision-making purpose, the ROI for the BPA Project should be computed based on the above financial savings, and comparing with the Investment required for the BPA Project.
7. Develop the BPA	(a) Based on the ROI, BPA Reports, etc. Top Management approval to go ahead should be obtained. (b) Then, the Consultant develops the requisite BPA to meet the specified goals.
8. Test the BPA	(a) The new process should be tested to determine how well it works and identify where additional "exception processing" steps need to be included. (b) Testing is an iterative process, and seeks to remove all problems. (c) Testing – (i) allows room for improvements prior to the official launch of the new process, (ii) increases user adoption, and (iii) decreases resistance to change. (d) The Final Version of the Process should be documented , to capture all of the work, thinking and experience in developing the BPA, and which can be used to train new people.

7. (a) What is Transmission Media? Discuss its various types. (4 Marks)

Transmission Media connects the message source with the message receiver by means of Guided or Unguided Media.

Guided Media/Bound Media: Guided Transmission Media uses a "cabling" system that guides the data signals along a specific path. Some of the common examples of guided media are Twisted Pair, Coaxial cable and Fibre optics.

1. **Twisted-Pair Wire:** Twisted-pair is ordinary telephone wire, consisting of copper wire twisted into pairs. It is the most widely used media for telecommunications and is used for both voice and data transmissions. It is used extensively in home and office telephone systems and many LANs and WANs.
2. **Coaxial Cable:** This telecommunication media consists of copper or aluminium wire wrapped with spacers to insulate and protect it. Coaxial cables can carry a large volume of data and allows high-speed data transmission used in high-service metropolitan areas for cable TV systems, and for short-distance connection of computers and peripheral devices. It is used extensively in office buildings and other work sites for local area networks.
3. **Fibre Optics:** This media consists of one or more hair-thin filaments of glass fibre wrapped in a protective jacket. Signals are converted to light form and fired by laser in bursts. Optical fibres can carry digital as well as analog signals and provides increased speed and greater carrying capacity than coaxial cable and twisted-pair lines.





Unguided Media/Unbound Media: Unguided Transmission Media consists of a means for the data signals to travel but nothing to guide them along a specific path. The data signals are not bound to a cabling media. Some of the common examples of unguided media are Terrestrial Microwave, Radio Waves, Micro Waves, Infrared Waves and Communication Satellites.

♦ **Terrestrial Microwave:** Terrestrial microwave media uses the atmosphere as the medium through which to transmit signals and is used extensively for high-volume as well as long-distance communication of both data and voice in the form of electromagnetic waves.

♦ **Radio Waves:** Radio waves are an invisible form of electromagnetic radiation that varies in wavelength from around a millimeter to 100,000 km, making it one of the widest ranges in the electromagnetic spectrum. Radio waves are most commonly used transmission media in the wireless Local Area Networks.

♦ **Micro Waves:** Microwaves are radio waves with wavelengths ranging from as long as one meter to as short as one millimeter, or equivalently, with frequencies between 300 MHz (0.3 GHz) and 300 GHz. These are used for communication, radar systems, radio astronomy, navigation and spectroscopy.

♦ **Infrared Waves:** Infrared light is used in industrial, scientific, and medical applications. Night-vision devices using infrared illumination allow people or animals to be observed without the observer being detected.

♦ **Communication Satellites:** Communication satellites use the atmosphere (microwave radio waves) as the medium through which to transmit signals. A satellite is some solar-powered electronic device that receives, amplifies, and retransmits signals; the satellite acts as a relay station between satellite transmissions stations on the ground (earth stations). They are used extensively for high-volume as well as long-distance communication of both data and voice.

(b) Define Threat. What are various threats to a computer network's security? (4 Marks)

Threat: A Threat is anything that can disrupt the operation, functioning, integrity, or availability of a network or system. Network security threats can be categorized into four broad themes:

♦ **Unstructured Threats** - These originate mostly from inexperienced individuals using easily available hacking tools from the Internet. Many tools available to anyone on the Internet can be used to discover weaknesses in a company's network. These include port-scanning tools, address-sweeping tools, and many others. Most of these kinds of probes are done more out of curiosity than with a malicious intent in mind.

For example, if a company's external web site is hacked; the company's integrity is damaged. Even if the external web site is separate from the internal information that sits behind a protective firewall, the public does not know that. All they know is that if the company's web site is hacked, then it is an unsafe place to conduct business.

♦ **Structured Threats** - These originate from individuals who are highly motivated and technically competent and usually understand network systems design and the vulnerabilities of those systems. They can understand as well as create hacking scripts to penetrate those network systems. An individual who presents a structured threat typically targets a specific destination or group. Usually, these hackers are hired by industry competitors, or state-sponsored intelligence organizations.

♦ **External Threats** - These originate from individuals or organizations working outside an organization, which does not have authorized access to organization's computer systems or network. They usually work their way into a network from the Internet or dialup access servers.

Internal Threats - Typically, these threats originate from individuals who have authorized access to the network. These users either have an account on a server or physical access to the network. An internal threat may come from a discontented former or current employee or contractor. Majority of security incidents originate from internal threats.

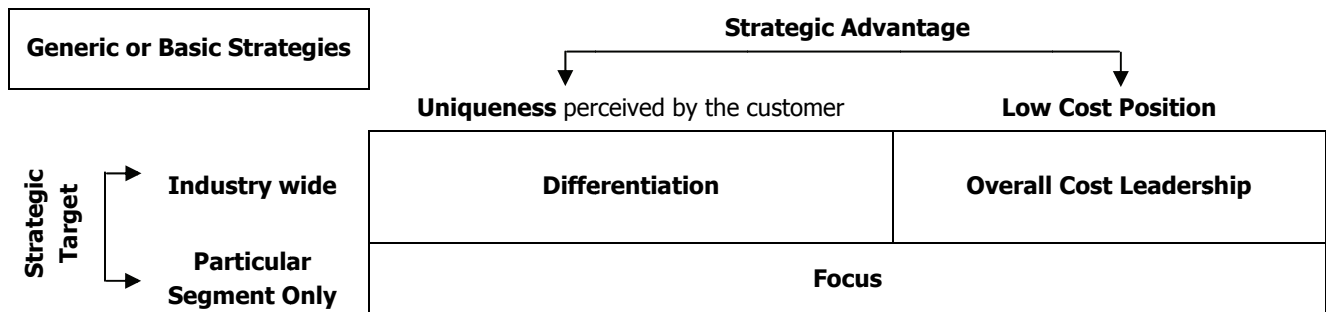


Section-B

Question 8 is compulsory. Answer any 5 Questions from the remaining questions.

8. (a) Discuss strategic alternatives with reference to Michael Porter's strategies. (5 Marks)

1. **Classification:** According to Porter, **Generic or Basic Strategies** allow organizations to gain competitive advantage from three different bases –
 - (a) **Cost Leadership**, i.e. producing standardized products at a very **low** per unit costs, for consumers who are price-sensitive.
 - (b) **Differentiation**, i.e. producing products and services considered **unique** industry-wide and directed at consumers who are relatively price-insensitive.
 - (c) **Focus**, i.e. producing products and services that fulfill the needs of **small** groups of consumers.
2. **Factors:** Porter suggested that the appropriate strategy may be based on an evaluation of the following –
 - (a) **Sharing:** Managers should perform cost-benefit analysis to evaluate "sharing opportunities" among a Firm's existing and potential business units. Sharing activities and resources enhances competitive advantage by– (i) lowering costs, or (ii) raising differentiation.
 - (b) **Transfer of Skills:** Firms can "transfer" skills and expertise among autonomous business units effectively in order to gain competitive advantage.
 - (c) **Size:** Large Firms with greater access to resources can adopt Cost Leadership and / or Differentiation strategy while small Firms have to adopt Focus strategy.
 - (d) **Others:** In addition to the above, the type of industry and intensity of competition also play a role in deciding the appropriate strategy.



(b) Is Supply Chain Management same as Logistic management? (5 Marks)

- Supply Chain Management is an extension of Logistics Management. However, the differences between the two are –
1. **Scope of Activities:** Logistical activities typically include management of inbound and outbound goods, transportation, warehousing, handling of material, fulfillment of orders, inventory management, supply and demand planning. Although these activities also form part of Supply Chain Management, the latter has different components. Logistic Management can be termed as one of its part that is related to planning, implementing and controlling the movement and storage of goods, services and related information between the point of origin and point of consumption.
 2. **Focus of Activities:** Supply Chain Management includes more aspects apart from the logistics function. 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.

(c) Explain the meaning of Synchro Marketing and Augmented Marketing. (5 Marks)

1. **Synchro Marketing:** In some cases, the demand for the product is irregular, due to season, some parts of the day, or on hour basis, causing idle capacity or over-worked capacities. In such cases, synchromarketing can be used to smoothen or regularize the pattern of demand through flexible pricing, promotion, and other incentives. E.g. Fans and ACs sold at off season prices.



- 2. **Augmented Marketing:** It refers to provision of additional customer services and benefits built around the actual products, and introduction of hi-tech services, e.g. movies on demand, on-line computer repair services, secretarial services, etc. Such innovative offerings provide a set of benefits that promise to increase customer service to much higher levels.

9. (a) **What do you understand by the term star in the context of BCG matrix? (3 Marks)**

Star in BCG Matrix: BCG growth-share matrix is a simple way to portray an organisation'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. The matrix is based on combinations of relative market share of the products or SBUs and their market growth rate.

Stars, a position in the matrix, are characterised by high market share and high growth rate. They are products or SBUs that are growing rapidly. They also need heavy investment to maintain their position and finance their rapid growth potential. Business organisations that enjoy star positions have best opportunities for expansion and growth.

(b) **What are the leadership roles played by a strategic leader? Distinguish between a transformational leader and a traditional leader. (4 Marks)**

Strategy Managers have the following leadership roles to play, to ensure effective strategy execution-

- 1. **Staying on top** of what is happening, closely monitoring progress, solving out issues, and learning what obstacles lie in the path of good execution.
- 2. Promoting a culture of esprit de corps (i.e. **team spirit**) that mobilizes and energizes organizational members to execute strategy in a competent fashion and perform at a high level.
- 3. Keeping the Firm responsive to changing conditions, alert for new opportunities, bubbling with **innovative ideas**, and ahead of rivals in developing competitively valuable competencies and capabilities.
- 4. Exercising **ethics leadership** to ensure that the Firm conducts its affairs like a model corporate citizen.
- 5. Pushing **corrective actions** to improve strategy execution and overall strategic performance.

Leadership Roles – various aspects

Visionary	Crisis Solver	Head Cheerleader
Chief Entrepreneur and Strategist	Spokesperson	Perceptive Listener
Chief Administrator	Negotiator	Decision-Maker
Culture Builder	Motivator	Coach and Adviser
Resource Acquirer and Allocator	Arbitrator	Policy Maker
Capabilities Builder	Process Integrator	Policy Enforcer

1. **Transformational Leadership Style:**

- (a) **Meaning:** Transformational Leadership Style use charisma and enthusiasm to inspire people to exert them for the good of the Firm. They offer excitement, vision, intellectual stimulation and personal satisfaction. It inspires involvement in a mission, giving followers a 'vision' of a higher calling so as to elicit more dramatic changes in organizational performance.
- (b) **Nature of Leadership:** Transformational Leadership Style motivates followers to do more than originally affected to do by stretching their abilities and increasing their self-confidence, and also promote innovation throughout the organization.
- (c) **Situations:** This style may be appropriate in turbulent environments, in industries at the very start or end of their life-cycles, in poorly performing organizations when there is a need to inspire a company to embrace major changes. Transformational Leaders will challenge established paradigms and ways of working, and will be very useful during periods of uncertainty when people are generally feeling quite distressed.

2. **Transactional Leadership style:**

- (a) **Meaning:** Transactional Leadership Style focus more on designing steps and controlling the organization's activities and are more likely to be associated with improving the current situation. It tries to build on the existing culture and enhance current practices.
- (b) **Nature of Leadership:** Transactional Leadership Style uses the authority of its office to exchange rewards, such as pay and status. They prefer a more formalized approach to motivation, setting clear goals with explicit rewards or penalties for achievement or non-achievement for employees' work efforts and generally seek to enhance an organization's performance steadily, but not dramatically.



(c) **Situations:** This style may be appropriate in settled environment, in growing or mature industries, and in organizations that are performing well. The style is better suited in persuading people to work efficiently and run operations smoothly.

Conclusion:

- Some researchers believe that leaders who rely too heavily upon charisma are not always effective in the long-term. This is because few individuals may be talented and energetic and are able to handle all types of business problems alone. They require people around them who are able support them, and who are prepared to tell them when things are going wrong.
- It can be concluded that there is no one single style of leadership suitable for all circumstances. Effective executives use a Leadership Style that is appropriate to the needs of the organization and its business situation.

10. (a) Contrast between Vertical, Horizontal, Concentric and Conglomerate Diversification. (4 Marks)

Type	Vertical	Horizontal	Concentric	Conglomerate
1. New Business es	Intermediary/ support services become new businesses.	Similar business at same stage of production – marketing chain.	New businesses/ products connected to existing facilities and products.	Completely new areas of activity / businesses.
2. Nature of Diversification	Related	Related	Related	Unrelated
3. Linkage to existing business	Vertical	Horizontal	Loop-like linkage to one or more products.	No linkages with existing product–process chain.

(b) Distinguish between Top-Down and Bottom-Up Strategic Planning. (Any 3 points) (3 Marks)

TOP DOWN APPROACH TO SYSTEMS DEVELOPMENT

Step	Description
1. Identify Firm's goals	<ul style="list-style-type: none"> • Identify the Firm's objectives and goals, and determine where it is going and what its Management wants to accomplish.
2. Identify Firm's functions	<ul style="list-style-type: none"> • Identify the functions of the organisation like Marketing, Production, R & D, etc. • Examine how these functions support the Firm in achieving its goals.
3. Ascertain functional activities	<ul style="list-style-type: none"> • Ascertain the major activities, decisions and duties of Managers, at various levels of hierarchy, in each of the organisational functions. • Analyse – (a) what decisions are made, (b) what decisions need to be made, and (c) when they should be made.
4. Identify decisions & information requirements	<ul style="list-style-type: none"> • Identify the models that guide managerial decision processes, and find out the information requirements for activities and decisions. • Provide an insight into what information is needed, when it is needed, and what forms is most useful. These factors provide the design specifications for application system.
5. Draft System program	<ul style="list-style-type: none"> • Prepare specific information processing programs in detail, & modules within these programmes. • Identify files and database for various decision applications. • Obtain Managers' and Users' approval, and implement the system.

BOTTOM UP APPROACH TO SYSTEMS DEVELOPMENT

Step	Description
1. Life Stream Systems	Life Stream Systems are those, which are essential for the day-to-day business activities, e.g. Payroll, Sales Order, Inventory Control, Purchasing, Production, etc.
2. Information requirements	Identify – (a) the basic transactions, (b) information file requirements, and (c) information processing programs, for each Life Stream System.
3. Info. System	Develop an information system for each life stream system.
4. Data Integration	Examine in detail the applications, files and records and integrate the data of each information system kept in different files. File integrated data – <ul style="list-style-type: none"> • Enhances the shareability and evolvability of the database, • Ensures that all programs use uniform data, and • Provides added capability for inquiry processing and adhoc requests for reports.
5. Supporting Models	Add Decision Models & Planning Models for supporting the planning activities of management control.



Step	Description
6. Main Model	Integrate all the models to evolve a complete model base. The models – <ul style="list-style-type: none"> Facilitate and support higher management activities, and Help to analyse different factors, understand difficult situations and formulate alternative strategies and options to deal them

This is the reverse of the top-down approach. Here, the Supervisory Level Management's involvement is more.

11. (a) Distinguish between SWOT and TOWS Matrix. (4 Marks)

TOWS Analysis is a variant of the classic business tool, SWOT Analysis. TOWS and SWOT are acronyms for different arrangements of the words Strengths, Weaknesses, Opportunities and Threats. By analyzing the external environment (threats and opportunities), and internal environment (weaknesses and strengths), we can use these techniques to think about the strategy of a company. Following are the some basic differences between TOWS and SWOT matrix:

- TOWS emphasises on external environment whereas SWOT emphasises on internal environment.
- TOWS matrix is about the combinations of SO, ST, WO, WT whereas SWOT matrix is about S, W, O, T.
- TOWS analysis is an action tool whereas SWOT analysis is a planning tool.
- TOWS is particularly useful in evaluating the potential impact of sudden events or developments while SWOT is usually employed in evaluating a company's business plan.

(b) Suggest the type of strategy which can be used in the following situations: (3 Marks)

- (i) **Dell Computer has decided to ensure stability by reallocation of resources from unprofitable to profitable businesses.**
Retrenchment Strategy
- (ii) **When a Firm's Cash Flows and Profitability are affected by rising competition, business cycles and economic volatility.**
Turnaround Strategy
- (iii) **When negative cash flows from a particular business create financial problems for the whole Company.**
Divestment Strategy

12. Write short notes on: (3 + 4 = 7 Marks)

(i) Kieretsus

Kieretsus is a loosely-coupled group of companies, usually in related industries. It is a Japanese term which is used for large cooperative networks of businesses. Kieretsus members are peers and may own significant amounts of each other's stock and have many board members in common.

(ii) Hourglass Structure

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.

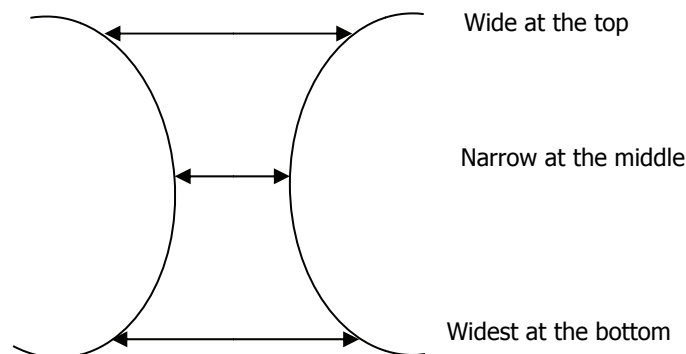


Figure: Hourglass Organisation Structure



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.

13. State whether the following statements are True or False with reasons. (1 × 7 = 7 Marks)

(a) E-commerce technology opens up a host of opportunities for reconfiguring industry and company value chains.	True: 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.
(b) SBU concepts facilitate multi-business operations.	True: Organizing business along SBU lines and creating strategic business units has become a common practice for multi-product/service and global organizations. It is a convenient and intelligent grouping of activities along distinct businesses and has replaced the conventional groupings. SBU facilitates strategic planning, gaining product-related/market-related specialization, gaining cost-economies and more rational organizational structure.
(c) Benchmarking is a remedy for all problems faced by organizations.	False: Benchmarking is an approach of setting goals and measuring productivity based on best industry practices and is a process of continuous improvement in search for competitive advantage. However, it is not panacea for all problems. Rather, it studies the circumstances and processes that help in superior performance. Better processes are not merely copied. Efforts are made to learn, improve and evolve them to suit the organizational circumstances.
(d) PESTLE analysis is used to monitoring the micro environmental factors.	False: The term PESTLE Analysis is used to describe a framework for analysis of macro environmental factors. It involves identification of political, economic, socio-cultural, technological, legal and environmental influences on an organization and providing a way of scanning the environmental influences that have affected or are likely to affect an organization or its policy. The advantage of this tool is that it encourages management into proactive and structured thinking.
(e) Re-engineering means partial modification or marginal improvement in the existing work processes.	False: Business Process Re-engineering (BPR) is the fundamental re-thinking and radical re-design of processes to achieve dramatic improvement , in critical, contemporary measures of performance such as cost, quality, service and speed.
(f) Strategy follows Structure.	False: Without a Strategy, Firms cannot design an Effective Structure.
(g) Profit may not be a universal objective, but business efficiency is definitely an objective common to all business.	True: Profit Maximization has a long-term perspective, and includes development of wealth, increased goodwill, and benefits to all Shareholders. Business efficiency is an economic version of the technical objective of productivity, i.e. designing and achieving suitable input output ratios of funds, resources, facilities and efforts.

14. Fill in the blanks: (1 × 7 = 7 Marks)

(a) Vision is always _____ oriented.	Future
(b) _____ means different things to different people.	Globalization
(c) _____ integrates Firms forward or backward in the Product Chain.	Vertical Diversification
(d) The orientation of the redesign effort refers to a total _____ and rethinking of entire business process.	Deconstruction
(e) Michael Porter's Generic Strategies allow organizations to gain competitive advantages by Cost Leadership, _____ and Focus.	Differentiation
(f) _____ portrays the distinct stages in the sales history of a Product.	Product Life Cycle
(g) Total Quality Management is a people focused Management system that aims at continual increase in _____ at continually lower real cost.	Customer Satisfaction