

MOCK TEST PAPER 1
INTERMEDIATE (IPC): GROUP – II
PAPER – 7: INFORMATION TECHNOLOGY AND STRATEGIC MANAGEMENT
SECTION – A: INFORMATION TECHNOLOGY
ANSWERS

Division A: MULTIPLE CHOICE QUESTIONS

1. (a) Virtualization
2. (d) Mobile computing
3. (b) Management Information system
4. (d) Analyze
5. (b) Bus Network
6. (b) Automating Repetitive Business Process
7. (c) Micro wave
8. (b) Personnel Management
9. (a) Database Administrator
10. (d) Authorization

Division B: DESCRIPTIVE QUESTIONS

1. (a) The cloud computing environment can consist of multiple types of clouds based on their deployment and usage.
 - **Public Clouds:** The public cloud is made available to the general public or a large industry group. They are administrated by third parties or vendors over the Internet, and services are offered on pay-per-use basis. The key benefits are
 - (a) It is widely used in the development, deployment and management of enterprise applications, at affordable costs;
 - (b) It allows organizations to deliver highly scalable and reliable applications rapidly and at more affordable costs.
 - **Private Clouds:** 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, but this comes at the cost of IT department creating a secure and scalable cloud.
 - **Community Clouds:** This is the sharing of computing infrastructure in between organizations of the same community. For example, all Government organizations within India may share computing infrastructure on the cloud to manage data. The risk is that data may be stored with the data of competitors.
 - **Hybrid Clouds:** 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.

- (b) **Packet Switching:** It is a sophisticated means of maximizing transmission capacity of networks. 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.
2. (a) Some Business Applications are as follows:
- (i) **Accounting Applications:** Accounting applications range from application software such as TALLY and wings to high-and applications such as SAP and Oracle Financials. These are used by business entities for the purpose of day-to-day transactions of accounting and generating financial information such as balance sheet, profit and loss account and cash flow statements. These are classified as accounting applications.
 - (ii) **Office Management Software:** These applications help entities to manage their office requirements like word processors (MS Word), electronic spreadsheets (MS Excel), presentation software (PowerPoint), file sharing systems, etc. The purpose is to automate the day-to-day office work and administration.
 - (iii) **Compliance Applications:** Enterprises need to comply with applicable laws and regulations. India has taken a long stride in adopting e-compliance for its citizens with government promoting e-filing of documents, e-payments taxes, e-storage of data, etc. This has raised the requirements for software which can help any entity achieve compliances. A separate class of business application are available that facilitate meeting the compliance requirements.
 - (iv) **Customer Relationship Management Software:** These are specialized applications catering to the need of organizations largely in FMCG (Fast-Moving Consumer Goods) categories. These entities need to interact with their customers and respond to them. The response may be in the form of service support or may lead to product innovation. These are sought by entities, which deal directly with consumers.
 - (v) **Management Support Software:** These are applications catering to decision-making needs of the management. They may be further classified based on the level of management using them. For example, Management Information System are generally used by middle level manager's for their decision making needs, on the other hand Decision Support Systems are used by top management for their information requirements.
 - (vi) **ERP Software:** These applications called as Enterprise Resource Planning software, which are used by entities to manage resources optimally and to maximize the three Es i.e. Economy, Efficiency and Effectiveness of business operations.
 - (vii) **Product Lifecycle Management Software:** These business applications are used by enterprises that launch new products and are involved in development of new products. The recent trend in auto-sector in India reflects the growing importance and need of this type of software. Each month a new product is launched by auto companies in India, may it be two-wheeler or four-wheeler segment. The top management of all these companies often say that "the life cycle of auto products have significantly reduced".
 - (viii) **Logistics Management Software:** For large logistics managing companies, these are key business applications. These companies need to keep track of products and people across the globe to check whether there are any discrepancies that need action.
 - (ix) **Legal Management Software:** In India, a lot of effort is being put to digitize the legal system. Government of India, is keen to reduce the pendency in courts. As this process goes on legal profession in India shall need such systems. There are big legal firms in India, which are already using such business applications.

- (x) **Industry Specific Applications:** These are industry specific applications focused on a specific industry sector. For example, software designed especially for Banking applications, Insurance applications, Automobile dealer system, billing systems for malls, Cinema ticketing software, Travel industry related software, etc.
- (b) Six Sigma follows a life-cycle having phases: Define, Measure, Analyze, Improve and Control (or DMAIC) which are described as follows
 - (i) **Define:** Customers are identified and their requirements are gathered. Measurements that are critical to customer satisfaction [Critical to Quality, (CTQ)] are identified for further project improvement.
 - (ii) **Measure:** Process output measures that are attributes of CTQs are determined and variables that affect these output measures are identified. Data on current process are gathered and current baseline performance for process output measures are established. Variances of output measures are graphed and process sigma are calculated.
 - (iii) **Analyze:** Using statistical methods and graphical displays, possible causes of process output variations are identified. These possible causes are analyzed statistically to determine root cause of variation.
 - (iv) **Improve:** Solution alternatives are generated to fix the root cause. The most appropriate solution is identified using solution prioritization matrix and validated using pilot testing. Cost and benefit analysis is performed to validate the financial benefit of the solution. Implementation plan is drafted and executed.
 - (v) **Control:** Process is standardized and documented. Before and after analysis is performed on the new process to validate expected results, monitoring system is implemented to ensure process is performing as designed. Project is evaluated and lessons learned are shared with others.
- 3. (a) **Threat:** A Threat is a possible danger 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.
 - ◆ **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. It has been seen that majority of security incidents originate from internal threats.

OR

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 facts 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.

(b) The various types of Information Systems are as follows:

- **Strategic-Level Systems:** For strategic managers to track and deal with strategic issues, assisting 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.
- **Management-Level Systems:** Used for the monitoring, controlling, decision-making, and administrative activities of middle management. Some of these systems deal with predictions or "what if..." type questions. Tracking current progress in accord with plans is another major function of systems at this level.
- **Knowledge-Level Systems:** These systems support discovery, processing and storage of knowledge and data workers. These further control the flow of paper work and enable group working.
- **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.

4. (a) There are three basic functions of Accounting Information System (AIS) and these are explained here.

- i. **Collect and store data:** Collect and store data about organization's business activities and transactions by capturing transaction data from source documents and posting data from journals to ledgers. Source documents are special forms used to capture transaction data such as sales order, sales invoice, order processing, purchase order, etc. Control over data collection is improved by pre-numbering each source document. Accuracy and efficiency in recording transaction data can be further improved if source documents are properly designed.

- II. **Record transaction:** Record transactions data into journals. These journals present a chronological record of what occurred and provide management with information useful for decision making. These documents are in the form of reports like financial statements, managerial reports, etc.
- III. **Safeguard organisational assets:** Provide adequate controls to ensure that data are recorded and processed accurately by safeguarding organizational assets (data and systems). The two important methods for accomplishing this objective are by providing adequate documentation of all business activities and an effective segregation of duties. Documentation allows management to verify that assigned responsibilities were completed correctly. Segregation of duties refers to dividing responsibility for different portions of a transaction among several people. 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.

(b) Some of the commercial applications of Artificial Intelligence (AI) are as follows:

Decision Support

- Intelligent work environment that will help you capture the “why” as well as the “what” of engineered design and decision making.
- Intelligent human–computer interface (HCI) systems that can understand spoken language and gestures, and facilitate problem solving by supporting organization wide collaborations to solve particular problems.
- Situation assessment and resource allocation software for uses that range from airlines and airports to logistics centers.

Information Retrieval

- AI-based Intranet and Internet systems that distill tidal waves of information into simple presentations.
- Natural language technology to retrieve any sort of online information, from text to pictures, videos, maps, and audio clips, in response to English questions.
- Database mining for marketing trend analysis, financial forecasting, and maintenance cost reduction, and more.

Virtual Reality

- X-ray-like vision enabled by enhanced-reality visualization that allows brain surgeons to “see through” intervening tissue to operate, monitor, and evaluate disease progression.
- Automated animation interfaces that allow users to interact with virtual objects via touch (e.g., medical students can “feel” what it's like to stitch severed aortas).

Robotics

- Machine-vision inspections systems for gauging, guiding, identifying, and inspecting products and providing competitive advantage in manufacturing.
- Cutting-edge robotics systems, from micro-robots and hands and legs.

5. (a) A **Relational Database Model** 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.

In Relational Database Model, 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 (and, thus, tables) 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.
- Third, each record will contain a single value for each of its attributes.

The relationships between records in same table or different tables can also be defined explicitly, by identifying or non-identifying parent-child relationships characterized by assigning cardinality (1:1, 1:M, M:M). Tables can also have a designated single attribute or a set of attributes that can act as a "key", which can be used to uniquely identify each record in the table.

A key that can be used to uniquely identify a row in a table is called a **primary key**. Keys are commonly used to join or combine data from two or more tables. Keys are also critical in the creation of indexes, which facilitate fast retrieval of data from large tables. Any column can be a key, or multiple columns can be grouped together into a compound key.

(b) The processing of Credit Card involves following steps:

- **Step 1: Authorization** – This is the first step in processing a credit card. After a merchant swipes the card, the data is submitted to merchant's bank, called an acquirer, to request authorization for the sale. The acquirer then routes the request to the card issuing bank, where it is authorized or denied, and the merchant is allowed to process the sale.
- **Step 2: Batching** – This is the second step in processing a credit card. At the end of a day, the merchant reviews all the day's sales to ensure they were authorized and signed by the cardholder. It then transmits all the sales at once, called a batch, to the acquirer to receive payment.
- **Step 3: Clearing** – This is the third step in processing a credit card. After the acquirer receives the batch, it sends it through the card network, where each sale is routed to the appropriate issuing bank. The issuing bank then subtracts its interchange fees, which are shared with the card network, and transfers the remaining amount through the network back to the acquirer.
- **Step 4: Funding** – This is the fourth and final step in processing a credit card. After receiving payment from the issuer, minus interchange fees, the acquirer subtracts its discount fee and sends the remainder to the merchant. The merchant is now paid for the transaction, and the cardholder is billed.

Using a credit card to make a purchase over the Internet follows the same scenario. But on the Internet, added steps must be taken to provide for secure transactions and authentication of both buyer and seller. To address these growing security concerns and pave the way for uninhibited growth of electronic commerce on the net, the two leading credit card brands, Visa and MasterCard, teamed up some years ago to develop a common standard to process card transactions on the Internet, called the Secure Electronic Transaction (SET) standard.

SECTION – B: STRATEGIC MANAGEMENT

SUGGESTED ANSWERS/HINTS

1.

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
a	b	c	d	b	a	a	a	b	b
(xi)	(xii)	(xiii)	(xiv)	(xv)					
a	c	c	a	d					

2. The competitive rivalry will be a significant force in case of company of Rajiv Arya as all the rivals are similar in sizes and are manufacturing similar products. It is difficult for any single manufacturer to dominate the market. Large number of patents will make it difficult for new entrants to break into the market. Further, as there are a large number of small suppliers the power that suppliers can exert will also be low.

There is no information relating to substitutes and bargaining power of customers in the information given in scenario. However, a domestic vacuum cleaner will directly compete with other options such as house maids. Availability of house maids at low cost can significantly disturb the sales of products.

Further, as the products are similar customers can easily shift from one company to another. This will only enhance competitive rivalry.

The competitive rivalry will be significant in Rajiv Arya's dealing industry as all rivals are similar in sizes and manufacture similar products, making it difficult for anyone manufacturer to dominates the market or gain market share. The large number of patents will make it hard for new entrants to break into the market, while the fact that Rajiv Arya buys from a large number of small suppliers suggests that supplier power is also low. Finally, there is no information relating to substitutes and bargaining power of customers in the information given in scenario.

3. (a) Network structure is a newer and somewhat more radical organizational design. The network structure could be termed a "non-structure" as it virtually eliminates in-house business functions and outsource many of them. An organisation organized in this manner is often called a virtual organization because it is composed of a series of project groups or collaborations linked by constantly changing non-hierarchical, cobweb-like networks. The network structure becomes most useful when the environment of a firm is unstable and is expected to remain so. Under such conditions, there is usually a strong need for innovation and quick response. Instead of having salaried employees, it may contract with people for a specific project or length of time. Long-term contracts with suppliers and distributors replace services that the company could provide for itself.
- (b) Enterprises pursue multiple objectives rather than a single objective. In general, we may identify a set of different business objectives pursued by a large cross-section of enterprises. Efficiency and profitability are two of the important objectives of any business. Efficiency is the relationship between input and output whereas profitability is the relationship between profits and investments.
- ◆ **Efficiency:** Business enterprise seek efficiency in rationally choosing appropriate means to achieve their goals, doing things in the best possible manner and utilising resources in a most suitable combination. In a sense, efficiency is an economic version of the technical objective of productivity – designing and achieving suitable input output ratios of funds, resources, facilities and efforts. Efficiency is a very useful operational objective.
 - ◆ **Profitability:** It is generally asserted that private enterprises are primarily motivated by the objective of profit. Some may go even further and emphasise that profit is the sole motive of business enterprises. All other objectives are facilitative objectives and are meant to be serve the profit motive. It is pointed out that private business enterprises are operated on behalf of

and for the benefit of the owners who have assumed the business risk of investing their funds.

4. (a) **The Role of IT in BPR:** The accelerating pace at which information technology has developed during the past few years had a very large impact in the transformation of business processes. Various studies have conclusively established the role of information technology in the transformation of business processes. Information technology is playing a significant role in changing the business processes.

A reengineered business process, characterized by IT-assisted speed, accuracy, adaptability and integration of data and service points, is focused on meeting the customer needs and expectation quickly and adequately, thereby enhancing his/her satisfaction level. With the help of tools of information technology organizations can modify their processes to make them automatic, simpler, time saving. Thus, IT can bring efficiency and effectiveness in the functioning of business.

- (b) **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. 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.

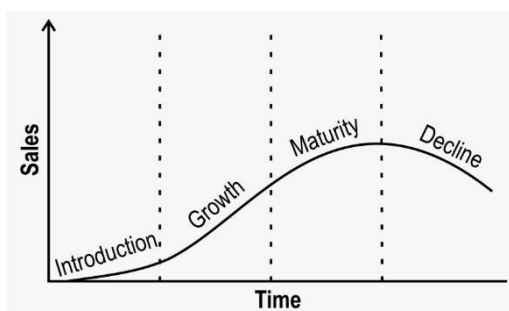
5. (a) Product life cycle is an important concept in strategic choice and S-shaped curve which exhibits the relationship of sales with respect of time for a product that passes through the four successive stages.

The first stage of PLC is the introduction stage in which competition is almost negligible, prices are relatively high and markets are limited. The growth in sales is also at a lower rate.

The second stage of PLC is the growth stage, in which the demand expands rapidly, prices fall, competition increases and market expands.

The third stage of PLC is the maturity stage, where in the competition gets tough and market gets stabilized. Profit comes down because of stiff competition.

The fourth stage is the declining stage of PLC, in which the sales and profits fall down sharply due to some new product replaces the existing product.



Product Life Cycle

PLC can be used to diagnose a portfolio of products (or businesses) in order to establish the stage at which each of them exists. Particular attention is to be paid on the businesses that are in the declining stage. Depending on the diagnosis, appropriate strategic choice can be made. For instance, expansion may be a feasible alternative for businesses in the introductory and growth stages. Mature businesses may be used as sources of cash for investment in other businesses which need resources. A combination of strategies like selective harvesting, retrenchment, etc. may be adopted for declining businesses. In this way, a balanced portfolio of businesses may be built up by exercising a strategic choice based on the PLC concept.

- (b) Corporate strategy in the first place ensures the growth of the organisation and ensures the correct alignment of the organization with its environment. It serves as the design for filling the strategic planning gap. It also helps build the relevant competitive advantages. It works out the right fit between the organization and its external environment. Basically, the purpose of corporate strategy is to harness the opportunities available in the environment, countering the threats embedded therein.

Corporate strategy brings methodical responses to the environment. Strategy is the opposite of adhoc responses to the changes in the environment in competition, consumer tastes, technology and other variables. It amounts to long-term, well thought-out and prepared responses to the various environment forces.

- 6. (a) Production system is concerned with the capacity, location, layout, product or service design, work systems, degree of automation, extent of vertical integration, and such factors. Strategies related to production system are significant as they deal with vital issues affecting the capability of the organisation to achieve its objectives.

Strategy implementation would have to take into account the production system factors as they involve decisions which are long-term in nature and influence not only the operations capability of an organisation but also its ability to implement strategies and achieve objectives.

- (b) Diversification endeavours can be related or unrelated to existing businesses of the firm. Based on the nature and extent of their relationship to existing businesses, diversification endeavours have been classified into four broad categories:
 - (i) Vertically integrated diversification
 - (ii) Horizontally integrated diversification
 - (iii) Concentric diversification
 - (iv) Conglomerate diversification