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SUGGESTED SOLUTION

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Answer-1 (a) :

Six Sigma – Six Sigma employs quality management and statistical analysis of processoutputs by identifying and removing the causes of defects (errors) and minimizingvariability in manufacturing and business processes. Each Six Sigma project carried outwithin an organization follows a defined sequence of steps and has quantified valuetargets, for example: reduce process cycle time, reduce pollution, reduce costs, increase customer satisfaction, and increase profits. It follows a life-cycle having phases: Define,Measure, Analyze, Improve and Control (or DMAIC) which are described as follows. **(1 Mark)**

(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.

(1 Mark)

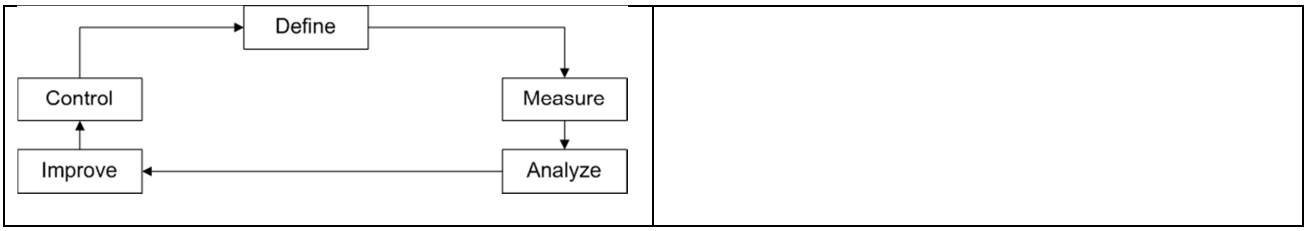
(ii) Measure: Process output measures that are attributes of CTQs are determined andvariables that affect these output measures are identified. Data on current process are gathered and current baseline performance for process output measures are established. Variances of output measures are graphed and process sigma are calculated. **(1 Mark)**

(iii) Analyze: Using statistical methods and graphical displays, possible causes of process output variations are identified. These possible causes are analyzedstatistically to determine root cause of variation.

(1 Mark)

(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. **(1 Mark)**

(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. **(1 Mark)**



Answer-1 (b) :

Service Models of Cloud Computing are as follows:

- **Infrastructure as a Service (IaaS):** It is the foundation of cloud services that provides clients with access to server hardware, storage, bandwidth and other fundamental computing resources. The service is typically paid for on a usage basis and may also include dynamic scaling so that if the customer needs more resources than expected, s/he can get them on the fly (probably to a given limit). It provides access to shared resources on need basis, without revealing details like location and hardware to clients **(1 Mark)**
- **Software as a Service (SaaS):** It includes a complete software offering on the cloud. Users can access a software application hosted by the cloud vendor on pay-per-use basis. SaaS is a model of software deployment where an application is hosted as a service provided to customers across the Internet by removing the need to install and run an application on a user's own computer. SaaS can alleviate the burden of software maintenance and support but users relinquish control over software versions and requirements. **(1 Mark)**
- **Platform as a Service (PaaS):** It provides clients with access to the basic operating software and optional services to develop and use software applications (e.g. database access and payment service) without the need to buy and manage the underlying computing infrastructure. For example, Google App Engine allows clients to run their web applications (i.e. software that can be accessed using a web browser such as Internet Explorer over the internet) on Google's infrastructure **(1 Mark)**
- **Network as a Service (NaaS):** It is a category of cloud services where the capability provided to the cloud service user is to use network/transport connecting services. NaaS involves optimization of resource allocation by considering network and computing resources as a whole. Some of the examples are: Virtual Private Network, Mobile Network Virtualization etc.

- **Communication as a Service (CaaS):**CaaS is an outsourced enterprise communication solution that can be leased from a single vender. The CaaS vendor is responsible for all hardware and software management and offers guaranteed Quality of Service (QoS). It allows businesses to selectively deploy communication devices and modes on a pay-as-you-go, as-needed basis. This approach eliminates the large capital investments. Examples are: Voice over IP (VoIP), Instant Messaging (IM), Collaboration and Videoconferencing application using fixed and mobile devices. **(1 Mark)**

Answer-1 (c) :

Management of logistics is a process which integrates the flow of supplies into and out of an organization to achieve a level of service which ensures that the right materials are available at the right place, at the right time, of the right quality, and at the right cost. **(1 Mark)**

To have an effective logistics strategy, the organization has to ponder the following issues and formulate strategy comfortable with their issues:

1. The sources of raw materials and components needed for production of goods. **(0.5 Mark)**
2. To ascertain the number of manufacturing units, their location etc to decide about transport facility. **(0.5 Mark)**
3. Products being produced at different manufacturing location **(0.5 Mark)**
4. To decide about the different modes of transportation facilities **(0.5 Mark)**
5. What is the nature of distribution facilities? **(0.5 Mark)**
6. What is the nature of materials handling equipment possessed? Is it ideal? **(0.5 Mark)**
7. What is the method for deploying inventory in the logistics network? **(0.5 Mark)**
8. Should the business organization own the transport vehicles? **(0.5 Mark)**

Answer-1 (d) :

A Mission statement tells you the fundamental purpose of the organization. It concentrates on the present. It defines the customer and the critical processes. It informs you of the desired level of performance. On the other hand, a Vision statement outlines what the organization wants to be. It concentrates on the future. It is a source of inspiration. It provides clear decision-making criteria. **(1 Mark)**

A mission statement can resemble a vision statement in a few companies, but that can be a grave mistake. It can confuse people. Following are the differences between vision and mission: **(1 Mark)**

The vision describes a future identity while the Mission serves as an ongoing and time-independent guide.The vision statement can galvanize the people to achieve defined objectives, even if they are stretch objectives, provided the vision is specific, measurable, achievable, relevant and time bound. A mission statement provides a path to realize the vision in line with its values. These statements have a direct bearing on the bottom line and success of the organization. **(2 Marks)**

A mission statement defines the purpose or broader goal for being in existence or in the business and can remain the same for decades if crafted well while a vision statement is more specific in terms of both the future state and the time frame. Vision describes what will be achieved if the organization is successful. **(1 Mark)**

Answer-2 (a) :

- Improving Collaboration and Information Sharing: Business processes designed through a collaborative interface mean Information Technology can integrate its processes with the business-side logic that drives day-to-day operations. **(1 Mark)**
- Reducing the Impact of Human Error: BPA removes human participation in the process, which is the source of many errors. **(1 Mark)**
- 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. **(1 Mark)**
- 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. **(1 Mark)**
- 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. **(1 Mark)**
- Making the business more responsive: Business can easily automate new applications and processes as they are introduced. **(1 Mark)**

Answer-2 (b) :

(a) Network Interface Card (NIC) – Network Interface Card (NIC) is a computer hardware component that connects a computer to a computer network. It has additional memory for buffering incoming and outgoing data packets, thus improving the network throughput. **(2 Marks)**

(b) MODEM – A MODEM is a device that converts a digital computer signal into an analog telephone signal (i.e. it modulates the signal) and converts an analog telephone signal into a digital computer signal (i.e. it demodulates the signal) in a data communication system. **(2 Marks)**

Answer-2 (c) :

There are several reasons why companies go global. These are discussed as follows:

1. One reason could be the rapid shrinking of time and distance across the globe thanks to faster communication, speedier transportation, growing financial flows and rapid technological changes **(1 Mark)**
2. It is being realised that the domestic markets are no longer adequate and rich Japanese have flooded the U.S. market with automobiles and electronics because the home market was not large enough to absorb whatever was produced. Some European companies have gone global for similar reason. **(1 Mark)**
3. According to Raymond Vernon companies that develop attractive new products sell them first in their home markets. Sooner or later, foreigners may learn about these products. At this stage, most companies would export the product or service rather than produce it abroad. But as foreign demand grows, the economics of foreign production change. Eventually, the foreign market becomes large enough to justify foreign investment **(1 Mark)**
4. Another reason for going overseas may also vary by industry. Petroleum and mining companies often go global to secure a reliable or cheaper source of raw-materials. Some manufacturing companies, by contrast, have often ventured overseas to protect old markets or to seek new ones. For example cheap labour in India lure foreign investors. **(1 Mark)**
5. Companies often set up overseas plants to reduce high transportation costs. The higher the ratio of the unit cost to the selling price per unit, the more significant the transportation factor becomes **(1 Mark)**
6. The motivation to go global in high-tech industries is slightly different. Companies in electronics and telecommunications must spend large sums on research and development for new products and thus may be compelled to seek ways to improve sales volume to support high overhead expenses. If domestic sales and exports do not generate sufficient cash flow, the companies naturally might look to overseas manufacturing plants and sales branches to generate higher sales and better cash flow. **(1 Mark)**

Answer-3 (a) :

Protocol defines the Following three aspects of digital communication: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. **(2 Marks)**

(b) Semantics: Type and order of messages used to ensure reliable and error free information transfer. **(2 Marks)**

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

Answer-3 (b) :

An opportunity is a favourable condition in the organisation's environment which enables it to strengthen its position. On the other hand a threat is an unfavourable condition in the organisation's environment which causes a risk for, or damage to, the organisation's position. An opportunity is also a threat in case internal weaknesses do not allow organization to take their advantage in a manner rivals can. **(1 Mark)**

The IPL (Cricket) tournament is highly profit and entertainment driven. A number of entities and process are involved in this IPL type tournament. IPL (Cricket) type of tournament would offer opportunities/threats to the following industries: **(1 Mark)**

Opportunities:

- Stadiums.
- Sports Industry.

• Manufactures of sports items.
• Media Industry – Sports channels / television, advertisers. **(2 Marks)**

Threats:

• Entertainment industry like TV serials, cinema theatres, Entertainment theme parks as competitors will be fighting for the same viewers/target customers.
• Tourism and hotel Industry.
• Event Management. **(2 Marks)**

Answer-3 (c) :

Backward integration is a step towards, creation of effective supply by entering business of input providers. Strategy employed to expand profits and gain greater control over production of a product whereby a company will purchase or build a business that will increase its own supply capability or lessen its cost of production. **(1 Mark)**

In case of hospitals there can be number of businesses that can be entered. Following are indicative list of backward integration strategies that hospitals may pursue:

• Drugs and pharmaceuticals – Specific drugs can be manufactured or traded.
• Business of gases required in hospitals – oxygen.
• Pathology labs / diagnostic services. This can be created in-house if not available already. Alternatively, a chain can be started. • Blood Banks.
• Ambulance services. **(3 Marks)**

Answer-4 (a) :

An Expert System (ES) is a computerized information system that allows non-experts to make decisions comparable to those of an expert. The aim of the expert system is to have a team of seasoned specialists holding industry-wide experience who further spread across implementations like in Defense, Government, Finance, Telecom, and Engineering sectors. **(1 Mark)**

Components of an Expert System are as follows:

(a) Knowledge Base: This includes the data, knowledge, relationships, rules of thumb (heuristics), and decision trees used by experts to solve a particular problem. A knowledge base is the computer equivalent of all the knowledge and insight that an expert or group of experts develop through years of experience in their field. The knowledge base of expert system encloses both realistic and heuristic knowledge. Realistic knowledge is that knowledge of the job domain that is extensively shared, characteristically found in textbooks or journals whereas heuristic knowledge is the fewer rigorous, extra empirical, supplementary judgmental knowledge of performance. **(2 Marks)**

(b) Database of Facts: This holds the user's input about the current problem. The user may begin by entering as much as they know about the problem or the inference engine may prompt for details or ask whether certain conditions exist. Gradually a database of facts is built up which the inference engine uses to come to a decision. The quality and quantity of data gained from the user influences the reliability of the decision. **(1 Mark)**

(c) Inference Engine: This program contains the logic and reasoning mechanisms that simulate the expert logic process and deliver advice. It uses data obtained from both the knowledge base and the user to make associations and inferences, form its conclusions, and recommend a course of action. **(1 Mark)**

(d) Explanation facility: This facility provides the user with an explanation of the logic the Expert System used to arrive at its conclusion. **(0.5 Mark)**

(e) User Interface: This program allows the user to design, create, update, use and communicate with the expert system. **(0.5 Mark)**

Answer-4 (b) :

Supply chain management is an extension of logistic management. However, there are differences between the two. Logistical activities typically include management of inbound and outbound goods, transportation, warehousing, handling of material, fulfilment of orders, inventory management and supply/demand planning. **(1 Mark)**

Although these activities also form part of supply chain management, the latter is much broader. 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 the point of consumption. **(1 Mark)**

Supply chain management is an integrating function of all the major business activities and business processes within and across organisations. Supply Chain Management is a systems view of the linkages in the chain consisting of different channel partners – suppliers, intermediaries, third- party service providers and customers. Different elements in the chain work together in a collaborative and coordinated manner. Often it is used as a tool of business transformation and involves delivering the right product at the right time to the right place and at the right price. **(2 Marks)**

Answer-4 (c) :

Threat: A threat is anything that can disrupt the operation, functioning, integrity, or availability of a network or system. **(0.5 Mark)**

Vulnerability: Vulnerability is an inherent weakness in the design, configuration, or implementation of a network or system that renders it susceptible to a threat. **(0.5 Mark)**

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. **(1 Mark)**
- 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. **(1 Mark)**
- 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. **(1 Mark)**
- 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. **(1 Mark)**
- End users - Generally, users of computer systems are not professionals and are not always security conscious. For example, when the number of passwords of a 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, users do human errors, for example save confidential files to places where they are not properly protected. **(1 Mark)**

Answer-5 (a) :

Grid systems and applications require standard security functions which are Authentication, Access Control, Integrity, Privacy, and No Repudiation. Authentication and access control issues are:

a. To provide authentication to verify the users,process which have user's computation and resources used by the processes to authenticate

b. To allow local access control mechanisms to be used without change. **(2 Marks)**

To develop security architecture, following constraints are taken from the characteristics of grid environment and application.

1. **Single Sign-on:** A user should authenticate once and they should be able to acquire resources, use them, and release them and to communicate internally without any further authentication. **(1 Mark)**
2. **Protection of Credentials:** User passwords, private keys, etc. should be protected. **(1 Mark)**
3. **Interoperability with local security solutions:** Access to local resources should have local security policy at a local level. Despite of modifying every local resource there is an inter-domain security server for providing security to local resource. **(1 Mark)**
4. **Exportability:** The code should be exportable i.e. they cannot use a large amount of encryption at a time. There should be a minimum communication at a time. **(1 Mark)**
5. **Support for secure group communication:** In a communication there are number of processes which coordinate their activities. This coordination must be secure and for this there is no such security policy. **(1 Mark)**
6. **Support for multiple implementations:** There should be a security policy which should provide security to multiple sources based on public and private key cryptography. **(1 Mark)**

Answer-5 (b) :

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. **(2 Marks)**

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 Mark)**

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. **(1 Mark)**
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. **(1 Mark)**
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. **(1 Mark)**
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. **(1 Mark)**
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. **(1 Mark)**

Answer-6 (a) :

Organizational Business Processes: Organizational business processes are highlevel processes that are typically specified in textual form by their inputs, their outputs, their expected results and their dependencies on other organizational business processes. These business processes act as supplier or consumer processes. To manage incoming raw materials provided by a set of suppliers is an example of an organizational business process.While organizational business processescharacterize coarse-grained business functionality, there are multiple operational business processes that contribute to one organizational business process. **(3 Marks)**

Operational Business Processes: In Operational Business Processes, the activities and their relationships are specified, but implementation aspects of the business process are disregarded. Operational business processes are specified by business process models.These are the basis for developing implemented business processes. **(3 Marks)**

Answer-6 (b) :

Marketing mix is a systematic way of classifying the key decision areas of marketing management. It is the set of controllable marketing variables that the firm blends to produce the response it wants in the target market. The original framework of marketing mix comprises of 4Ps- product, price, place and promotion. These are subsequently expanded to highlight certain other key decision areas like people, processes, and physical evidence. The elements of original framework are: **(2 Marks)**

- Product: It stands for the "goods-and-service" combination the company offers to the target market. **(0.5 Mark)**

- Price: It stands for the amount of money customers have to pay to obtain the product. **(0.5 Mark)**
- Place: It stands for company activities that make the product available to target consumers and include marketing channel, distribution policies and geographical availability. **(0.5 Mark)**
- Promotion: It stands for activities that communicate the merits of the product and persuade target consumers to buy it. **(0.5 Mark)**

Answer-6 (c) :

Some of the prominent characteristics of C/S architecture are as follows:

- Service: C/S provides a clean separation of function based on the idea of service. The server process is a provider of services and the client is a consumer of services.
- Shared Resources: A server can service many clients at the same time and regulate their access to the shared resources.
- Transparency of Location: C/S software usually masks the location of the server from the clients by redirecting the service calls when needed.
- Mix-and-Match: The ideal C/S software is independent of hardware or Operating System software platforms.
- Scalability: In a C/S environment, client workstations can either be added or removed and also the server load can be distributed across multiple servers.
- Integrity: The server code and server data is centrally managed, which results in cheaper maintenance and the guarding of shared data integrity. At the same time, the clients remain personal and independent. **(4 Marks)**

Issues in Client/Server Network

(i) When the server goes down or crashes, all the computers connected to it become unavailable to use.

(ii) Simultaneous access to data and services by the user takes little more time for server to process the task. **(2 Marks)**

Answer-7 (a) :

(i) Combination Strategies refer to a mix of different strategies like stability; expansion, diversification or retrenchment to suit particular situations that an enterprise is facing. For instance, a strategy of diversification/acquisition may call for retrenchment in some obsolete product lines. **(2 Marks)**

(ii) The corporate strategies a firm can adopt have been classified into four broad categories: stability, expansion, retrenchment, and combination known as directional/grand strategies. They are often called master or business strategies to provide basic direction for strategic actions toward achieving long-term business objectives. **(2 Marks)**

Answer-7 (b) :

Functional-level managers are responsible for the specific business functions or operations (human resources, purchasing, product development, customer service, and so on) that constitute a company or one of its divisions. Thus, a functional manager's sphere of responsibility is generally confined to one organizational activity, whereas general managers oversee the operation of a whole company or division. **(1 Mark)**

Although they are not responsible for the overall performance of the organization, functional managers nevertheless have a major strategic role: to develop functional strategies in their area that help fulfil the strategic objectives set by business- and corporate-level general managers **(1 Mark)**

Functional managers provide most of the information that makes it possible for business- and corporate-level general managers to, formulate realistic and attainable strategies. Indeed, because they are closer to the customer than the typical general manager is, functional managers themselves may generate important ideas that subsequently may become major strategies for the company. Thus, it is important for general managers to listen closely to the ideas of their functional managers. An equally great responsibility for managers at the operational level is strategy implementation: the execution of corporate and business-level plans. **(2 Marks)**

Answer-7 (c) :

For development of matrix structure Davis and Lawrence, have proposed three distinct phases:

1. Cross-functional task forces: Temporary cross-functional task forces are initially used when a new product line is being introduced. A project manager is in charge as the key horizontal link. **(1 Mark)**
2. Product/brand management: If the cross-functional task forces become more permanent, the project manager becomes a product or brand manager and a second phase begins. In this arrangement, function is still the primary organizational structure, but product or brand managers act as the integrators of semi permanent products or brands. **(1.5 Marks)**
3. Mature matrix: The third and final phase of matrix development involves a true dual- authority structure. Both the functional and product structures are permanent. All employees are connected to both a vertical functional superior and a horizontal product manager. Functional and product managers have equal authority and must work well together to resolve disagreements over resources and priorities. **(1.5 Marks)**

Answer-7 (d) :

Management Information System (MIS) refers to the data, equipment and computer programs that are used to develop information for managerial use. It is an integrated system which provides accurate, timely and meaningful data for management planning, analysis and control to optimize the growth of the organization. **(2 Marks)**

Management Information Systems provide decision-makers with preselected types of information. MIS is generally in the form of computer-generated reports and usually generated from data obtained from transaction processing systems. **(1 Mark)**

Airline reservations (seat, booking, payment, schedules, boarding list, special needs, etc.), Bank operations (deposit, transfer, withdrawal) electronically with a distinguish payment gateways, Integration of department with the help of contemporary software's like ERP, and Logistics management application to streamline the transportation system etc. are some of the examples of MIS. **(1 Mark)**