Question 1 (5 Marks)

(a) Abstract System: Abstract System also known as Conceptual System or Model can be defined as an orderly arrangement of interdependent ideas or constructs. For example, a system of theology is an orderly arrangement of ideas about God and the relationship of humans to God. 2

(b) Physical System: Physical System is a set of tangible elements, which operate together to accomplish an objective e.g. Computer system, University system etc. 1

(c) Open System: An Open System interacts with other systems in its environment and changes with changes in the environment. For example; Information system is an open system because it takes input from the environment and produces output to the environment, which changes as per the changes in the environment 2

Question 2 (6 marks)

Following are some of the important implications of Information Systems in business:

1. Information Systems help managers in efficient decision-making to achieve organizational goals. 1
2. Information Systems help managers in efficient decision-making to achieve organizational goals. 1
3. Information Systems help in making right decision at the right time i.e. just on time. 1
4. A good Information System may help in generating innovative ideas for solving critical problems. 1
5. Knowledge gathered though Information systems may be utilized by managers in unusual situations 1
6. Information System is viewed as a process; it can be integrated to formulate a strategy of action or operation 1

Question 3 (6 marks)

Quality Assurance management is concerned with ensuring that the –

1. Information systems produced by the information systems function achieve certain quality goals; and 1/2
2. Information systems produced by the information systems function achieve certain quality goals; and 1/2

The reasons for the emergence of Quality assurance in many organizations are as follows:

1. Organizations are increasingly producing safety-critical systems and users are becoming more demanding in terms of the quality of the software they employ to undertake their work.	1
2. Organizations are undertaking more ambitious projects when they build software.	1/2
3. Users are becoming more demanding in terms of their expectations about the quality of software they employ to undertake their work,	1
4. Organizations are becoming more concerned about their liabilities if they produce and sell defective software	1/2
5. Poor quality control over the production, implementation, operation, and maintenance of software can be costly in terms of missed deadlines, dissatisfied users and customer, lower morale among IS staff, higher maintenance and strategic projects that must be abandoned.	1
6. Improving the quality of Information Systems is a part of a worldwide trend among organizations to improve the quality of the goods and services they sell.	1

Question 4 (5 marks)

1) Computer Operations: The controls over computer operations govern the activities that directly support the day-to-day execution of either test or production systems on the hardware/software platform available. Three types of controls fall under this category: 1. Operation controls: These controls prescribe the functions that either human operators or automated operations facilities must perform. 2. Scheduling controls: These controls prescribe how jobs are to be scheduled on a hardware/software platform. 3. Maintenance controls: These controls prescribe how hardware is to be maintained in good operating order	2
2) Network Operations: This includes the proper functioning of network operations and monitoring the performance of network communication channels, network devices, and network programs and files. Data may be lost or corrupted through component failure. The primary components in the communication sub-systems are given as follows: o Communication lines viz. twisted pair, coaxial cables, fiber optics, microwave and satellite etc. o Hardware – ports, modems, multiplexers, switches and concentrators etc. o Software – Packet switching software, polling software, data compression software etc. o Due to component failure, transmission between sender and receiver may be disrupted, destroyed or corrupted in the communication system	3

Question 5 (5 marks)

Two types of errors can corrupt a data code and cause processing errors. These are transcription and transposition errors, which are as discussed below:

1. Transcription Errors: These fall into three classes: 2

a) Addition errors occur when an extra digit or character is added to the code. For example, inventory item number 83276 is recorded as 832766.
b) Truncation errors occur when a digit or character is removed from the end of a code. In this type of error, the inventory item above would be recorded as 8327
c) Substitution errors are the replacement of one digit in a code with another. For example, code number 83276 is recorded as 83266.

2. Transposition Errors: There are two types of transposition errors. 2

a) Single transposition errors occur when two adjacent digits are reversed. For instance, 12345 are recorded as 21345.
b) Multiple transposition errors occur when nonadjacent digits are transposed. For example, 12345 are recorded as 32154.

Any of these errors can cause serious problems in data processing if they go undetected. For example, a sales order for customer 987654 that is transposed into 897654 will be posted to the wrong customer's account. A similar error in an inventory item code on a purchase order could result in ordering unneeded inventory and failing to order inventory that is needed. These simple errors can severely disrupt operations 1

Question 6 (5 marks)

An incident or disaster affecting critical business operations can strike at anytime. Successful organizations have a comprehensive BCP Manual, which ensures process readiness, data and system availability to ensure business continuity. A BCP manual is a documented description of actions to be taken, resources to be used and procedures to be followed before, during and after an event that severely disrupts all or part of the business operations. The BCP is expected to provide: 1 1/2

Reasonable assurance to senior management of enterprise about the capability of the enterprise to recover from any unexpected incident or disaster affecting business operations and continue to provide services with minimal impact. 1

Anticipate various types of incident or disaster scenarios and outline the action plan for recovering from the incident or disaster with minimum impact and ensuring 'Continuous availability of all key services to clients'. 1

The BCP Manual is expected to specify the responsibilities of the BCM team, whose mission is to establish appropriate BCP procedures to ensure the continuity of enterprise's critical business functions. In the event of an incident or disaster affecting any of the functional areas, the BCM Team serves as liasioning teams between the functional area(s) affected and other departments providing support services. 1 1/2

Question 7 (6 marks)

Phase 5 – Plan Development: During this phase, recovery plans components are defined and plans are documented. This phase also includes the implementation of changes to user procedures, upgrading of existing data processing operating procedures required to support selected recovery strategies and alternatives, vendor contract negotiations (with suppliers of recovery services) and the definition of Recovery Teams, their roles and responsibilities. Recovery standards are also be developed during this phase. 2

Phase 6 – Testing/Exercising Program: The plan Testing/Exercising Program is developed during this phase. Testing/exercising goals are established and alternative testing strategies are evaluated. Testing strategies tailored to the environment should be selected and an on-going testing program should be established. 2

Phase 7 – Maintenance Program: Maintenance of the plans is critical to the success of an actual recovery. The plans must reflect changes to the environments that are supported by the plans. It is critical that existing change management processes are revised to take recovery plan maintenance into account. In areas, where change management does not exist, change management procedures will be recommended and implemented. Many recovery software products take this requirement into account. 2

Question 8 (6 marks)

Preliminary Investigation is predominantly aimed to determine and analyze the strategic benefits in implementing the system through evaluation and quantification of - productivity gains; future cost avoidance; cost savings, and Intangible benefits like improvement in morale of employees. The deliverable of the preliminary investigation includes a report including feasibility study observations. 2

A preliminary investigation is normally initiated by some sort of system request. The steps involved in the preliminary investigation phase are Identification of Problem, Identification of objectives, Delineation of scope, and Feasibility Study. Thereby, it largely enables the requirements engineer to tackle the issues and Feasibility Study for the following: 1 1/2

1. Determine whether the solution is as per the business strategy; 1/2
2. Determine whether the existing system can rectify the situation without a major modification; 1/2
3. Define the time frame for which the solution is required 1/2

4. Determine the approximate cost to develop the system; and 1/2

5. Determine whether the vendor product offers a solution to the problem. 1/2

Question 9 (6 marks)

A data dictionary contains descriptive information about the data items in the files of a business information system. Thus, a data dictionary is a computer file about data. Each computer record of a data dictionary contains information about a single data item used in a business information system. This information may include - the identity of the source document(s) used to create the data item; the names of the computer files that store the data item; the names of the computer programs that modify the data item; the identity of the computer programs or individuals permitted to access the data item for the purpose of file maintenance, upkeep, or inquiry; the identity of the computer programs or individuals not permitted to access the data item etc. 2

As new data fields are added to the record structure of a business file, information about each new data item is used to create a new record in the data dictionary. Similarly, when new computer programs are created that access data items in existing files, the data dictionary is updated to indicate the data items the new programs access. Finally, when data fields are deleted from the structure of file records, their corresponding records in the data dictionary are dropped. 2

Accountants and auditors can also make good use of a data dictionary. For example, a data dictionary can help to establish an audit trail because it can identify the input sources of data items, the computer programs that modify particular data items, and the managerial reports on which the data items are output. When an accountant participates in the design of a new system, a data dictionary can also be used to plan the flow of transaction data through the system. 2

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