Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination, December 2024

Set 1

Course: Introduction to IT Systems for Health Sciences — **Semester: 1st**

Program: B. Tech. (Biotechnology) and (Food Technology) — **Duration: 3 Hours**

Course Code: HSBT1003 — **Max. Marks: 100**

Instructions: Read all questions carefully.

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	In CPU architecture, what is the purpose of a "register"? a) To store data permanently for future retrieval b) To hold data temporarily for immediate processing c) To execute complex arithmetic operations d) To manage the flow of data between the CPU and memory	1.5	CO1
Q 2	Which generation of computers is known for using integrated circuits? a) First Generation b) Second Generation c) Third Generation d) Fourth Generation	1.5	CO1
Q 3	XML and JSON are examples of what type of data? a) Structured b) Semi-structured c) Unstructured d) All of the above	1.5	CO2
Q 4	Which of the following is a NoSQL database? a) MySQL b) PostgreSQL c) MongoDB d) Oracle	1.5	CO2
Q 5	Which ACID property ensures that no other operations interfere with a transaction during execution? a) Atomicity b) Isolation c) Consistency d) Durability	1.5	CO2
Q 6	What does a rectangle represent in an ER diagram? a) Attribute	1.5	CO3

	b) Entity c) Relationship d) Primary key		
Q 7	In-memory processing is ideal for: a) Batch processing b) Real-time analytics c) Archiving old data d) Storing large amounts of unstructured data	**1.5**	**CO3**
Q 8	Which organization maintains GenBank? a) EMBL b) NCBI c) Swiss Institute of Bioinformatics d) PDB	**1.5**	**CO3**
Q 9	Which database is best for 3D visualization of protein structures? a) GenBank b) SwissProt c) PDB d) RefSeq	**1.5**	**CO2**
Q 10	Information Systems in bioinformatics primarily deal with: a) Gathering and organizing biological data b) Developing machine learning models c) Designing hardware for bioinformatics applications d) DNA sequencing	**1.5**	**CO3**
Q 11	Feasibility analysis involves evaluating: a) Software costs only b) Technical, financial, and operational aspects c) Only the technical design d) The output of the system	**1.5**	**CO4**
Q 12	Which symbol in DFD represents a process? a) Rectangle b) Circle c) Arrow d) Diamond	**1.5**	**CO4**
Q 13	The purpose of input/output design in a software system is to: a) Maximize the storage space b) Define how the system interacts with users c) Define the hardware interface d) Store data efficiently	**1.5**	**CO4**
Q 14	In a Data Flow Diagram, the arrow represents: a) Data storage b) Data flow between processes c) Process specifications d) User interactions	**1.5**	**CO4**

Q 15	Which of the following is used for visualizing task dependencies in a project? a) Gantt Chart b) Pie Chart c) Line Chart d) Venn Diagram	**1.5**	**CO3**
Q 16	What is the purpose of using Tableau in data analytics? a) Storing large data sets b) Building databases c) Creating interactive dashboards and visualizations d) Programming	**1.5**	**CO5**
Q 17	Which of the following is a key benefit of using a CDS in preclinical development? a) Reduction in the need for human analysts b) Enhanced peak detection and quantification c) Removal of sample preparation steps d) Real-time chemical reaction monitoring	**1.5**	**CO5**
Q 18	What is a core component of LIMS? a) Peak integration algorithms b) Sample management and tracking c) Cloud storage d) DNA sequencing	**1.5**	**CO5**
Q 19	Which of the following is an advantage of using TIMS in laboratories? a) Advanced 3D modeling capabilities b) Efficient text data retrieval and management c) Real-time chemical reaction analysis d) Enhanced graphical reporting tools	**1.5**	**CO5**
Q 20	Which of the following is the file format for Tableau packaged workbooks? a) .twb b) .twbx c) .tbx d) .xlsx	**1.5**	**CO4**
	Section B **(4Qx5M=20 Marks)**		
Q 1	What is Chromatographic Data Analysis (CDS), and why is it important in preclinical development?	**5**	**CO5**
Q 2	List and briefly describe three types of charts or graphs that can be created in Tableau.	**5**	**CO4**
Q 3	Define a Data Flow Diagram (DFD) and explain its importance in information system design.	**5**	**CO3**

Q 4	Explain the concept of BASE properties in NoSQL databases and compare them with ACID properties. How do they contribute to the scalability and flexibility of NoSQL databases?	**5**	**CO2**
Section C (2Qx15M=30 Marks)			
Q 1	Describe the process of creating a dashboard in Tableau. What are the key considerations to ensure an effective and user-friendly dashboard? Use a case study example of creating a Tableau dashboard to monitor preclinical study data.	**15**	**CO4**
Q 2	Create an ER (Entity-Relationship) diagram for a student management system. Explain the entities, relationships, and attributes involved in the diagram, and describe how it helps in database design.	**15**	**CO2**
Section D (2Qx10M=20 Marks)			
Q 1	Discuss how computers are used in various sectors like education, healthcare, business, and entertainment.	**10**	**CO1**
Q 2	Explain the importance of input and output design in software development. Describe the key factors to consider when designing input forms and output reports to ensure usability, accuracy, and efficiency.	**10**	**CO3**