

**IM.Sc. (CS) Sem.-8 Examination
Web Data Management**

Time : 3.00 Hours]

July-2025

[Max.Marks : 70

Instructions:

- Write both the Sections in the separate answer book.
- Both Sections having equal weightage.
- Draw Diagrams wherever necessary.
- Make Assumptions wherever necessary.

SECTION – I

- Q-1 Do as Directed. [Any Seven] [7]
1. Define a well-formed XML document.
 2. What is an XML namespace used for?
 3. Differentiate between an XML attribute and an element.
 4. What is the role of the **let** clause in XQuery?
 5. What is the purpose of XLink in XML?
 6. Name any two axes used in XPath.
 7. Define ontology.
 8. Define full-text indexing.
- Q-2 **Attempt the following:**
- a. Describe the XML Data Model with an example. How does XML represent data hierarchically? [7]
- b. Differentiate between structured, semi-structured, and unstructured data with examples. How is XML used to represent semi-structured data? [7]
- OR**
- Q-2 **Attempt the following:**
- c. Explain the characteristics and challenges of modeling web data. Give examples of semi-structured data. [7]
- d. What are the basic components of XML? Explain XML syntax rules with examples. [7]
- Q-3 **Attempt the following:** [7]
- a. What is XQuery? Explain FLWOR expressions in detail with an example. [7]
- b. Compare DTD and XSD. [7]
- OR**
- Q-3 **Attempt the following:**
- c. What is XPath? Explain steps and path expressions with examples. [7]
- d. What is XQuery? Describe doc() and collection() with suitable example.

SECTION – II

- Q-4 Do as Directed. [Any Seven] [7]
1. What is the purpose of web analytics?
 2. Define page tagging.
 3. Name one open-source web analytics tool.
 4. What does Adwords help analyze?
 5. Give an example of a recommendation system.
 6. What does KPI stand for in web analytics?
 7. Define “XLink.”
 8. Define “XPointer “.
- Q-5 **Attempt the following:** [7]
- a. Describe the architecture of a web search engine. Explain parsing and indexing phases. [7]
 - b. Explain following terms with example in Distributed system.
1) Reliability 2) Scalability 3) Availability 4) Efficiency
- OR**
- Q-5 **Attempt the following:** [7]
- c. Compare and contrast page tags and log files in web analytics. Which provides better insight? [7]
 - d. Describe the features, benefits, and limitations of Google Analytics.
- Q-6 **Attempt the following:** [7]
- a. Explain the role of recommendation systems in web-scale applications with an example. [7]
 - b. What are ontologies? Explain their role in semantic web with a real-world example.
- OR**
- Q-6 **Attempt the following:** [7]
- c. What is distributed computing? Explain its use in building scalable web applications. [7]
 - d. Explain Web crawling process in details. [7]

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Candidate's Seat No: _____

**IM.Sc. (CS) Sem.-8 Examination
Deep Learning**

Time : 3.00 Hours]

July-2025

[Max.Marks : 70

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- **Both Sections having equal weightage.**
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- **Make Assumptions wherever necessary.**

Section – I

- Q.1 Define the following with example: (Any – 5) [15]
1. Convolution.
 2. Pooling.
 3. Stride.
 4. Padding.
 5. Sigmoid.
 6. Relu.
- Q.2 Answer the following: (Any – 4) [20]
1. Why are activation functions important in deep learning? What are the different types of activation functions, and for what kinds of tasks are they typically used?
 2. What are exploding gradients and vanishing gradients in deep learning, and how do they affect model training? In which scenarios do these issues typically occur?
 3. Explain what an Artificial Neural Network (ANN) is and how the backpropagation algorithm works?
 4. Describe the structure of a Multilayer Perceptron and explain its typical use cases in machine learning tasks?
 5. How do bias and variance relate to the curse of dimensionality in model training, and what impact do they have on model performance in high-dimensional datasets?

Section - II

- Q.3 Answer in detail: [10]
1. Explain the architecture and working of Long Short-Term Memory (LSTM) networks in deep learning. How do LSTMs address the vanishing gradient problem found in traditional RNNs? Discuss their key components and typical applications.

OR

1. Explain the architecture and working principle of Recurrent Neural Networks (RNNs) in deep learning. Discuss how RNNs handle sequential data, their limitations, and how these issues impact model performance.

Q.4 Differentiate the following: (Any – 5)

[25]

1. What is the role of dropout and drop connect in neural network training? How do they contribute to noise robustness?
 2. Describe the concept of adversarial training and its significance in improving model robustness.
 3. Discuss the challenges in optimization when training deep neural networks. How can second-order methods help?
 4. Explain the process of building a deep neural network architecture for image classification using TensorFlow.
 5. What is multi-task learning? How does it relate to regularization and model generalization?
 6. Explain the difference between L1 and L2 regularization. How do they affect model training and sparsity?
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