2012E1563 Candidate's Seat No:____

5/31

IMSc (CS) Sem.-9 Examination
Web Security
December-2025

Time : 3.00 Hours] **[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 [35]

Q-1 Do as directed. [attempt any seven out of eight]:

1. Mention two types of injection attacks. [1]
2. Mention types of XSS attacks. [1]
3. Define Authorization. [1]
4. Which encoding scheme is utilized for Indian Language Encoding? [1]
5. Write a simple script that prints "hello world!". [1]
6. What is the meaning of HTTP status code 200? [1]
7. List any two tools used to enhance web security. [1]
8. Mention any two HTTP methods. [1]

Q-2 Attempt the following :

a. Explain the concept of web security and the web, and differentiate between a website, a webpage, and a web server. [4]
b. Explain the HTTP protocol with suitable diagrams and describe its types. [5]
c. Define web services, list web services, and explain web services. [5]

OR

Q-2 Attempt the following :

a. Explain http status code. [3]
b. What is web functionality? Explain website functionalities. [5]
c. State the use of HTTP methods and differentiate between HTTP and HTTPS. [6]

Q-3 Attempt the following :

a. Differentiate between authentication and authorization. [4]
b. Explain design flaws in authentication mechanisms and also explain how to overcome those design flaws? [5]
c. List various injection attacks and explain any two in brief. [5]

OR

Q-3 Attempt the following:

a. Explain OS Command Injection with an example. [4]
b. Explain XSS injection along with its types and mitigation techniques. [5]
c. Explain XML Injection, its types, and mitigation techniques. [5]

P.T.O

E 153 — X

SECTION – II [35]

Q-4 Do as directed. [attempt any seven out of eight]:

1. Define web security with an example. [1]
2. List any 2 authentication techniques. [1]
3. What is the purpose of the ClusterBomb method? [1]
4. Give the full form of XSS. [1]
5. Give the full form of CSRF. [1]
6. Give the full form of HTTPS. [1]
7. Give the full form of XML. [1]
8. Give the full form of JSON. [1]

Q-5 Attempt the following:

a. Explain encoding along with its types. [4]
b. List any authentication techniques and explain those techniques in brief. [5]
c. Explain what SQL Injection is along with its types. [5]

OR

Q-5 Attempt the following:

a. Explain XML Injection along with its types. [4]
b. Explain LDAP Injection with an example. [5]
c. Explain XPath Injection with an example. [5]

Q-6 Attempt the following:

a. Explain user action. [4]
b. Explain Source Code Analysis with its approaches and Specific Source Code Review Techniques [5]
c. Explain Signature of common vulnerabilities. [5]

OR

Q-6 Attempt the following:

a. Explain how to perform source code analysis of ASP.NET, PHP platform. [4]
b. Explain following User attacks with its mitigation : Capturing cross-domain data. [5]
c. List all http methods and elaborate all methods. [5]

2012E1563 –3 Candidate's Seat No:____

IMSc (CS) Sem.-9 Examination
Natural Language Processing
December-2025

Time : 3.00 Hours] **[Max.Marks :70**

Instructions:

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

SECTION – I

Q-1 Answer the following questions (Any 3): **9**

a. Explain the components of Natural Language Processing? What are the real-life applications and ambiguity on all levels of language in it?

b. What is n-gram language modeling in the context of NLP? Explain the working flow of bigram language model?

c. What is Naïve Bayes? How can it be used for text classification.

d. Explain how regular expressions can be used for cleaning the text. What are the morphological analyzers?

Q-2 Answer the following questions (Any 2): **10**

a. Explain text preprocessing and text vectorization using BoW and TF-IDF and compare both.

b. How do Hidden Markov Models (HMM) contribute to Part-of-Speech (POS) tagging, and what is the role of the Viterbi algorithm with an example?

c. Compute the Levenstein, Damerau-Levenstein and hamming distance between the words "*saturday*" and "*sunday*". Construct the dynamic programming table for Levenstein distance. List the sequence of operations to transform "*saturday*" into "*sunday*" using all three methods. Explain how the edit distance can be used in spell-checking applications.

P.T.O

E1563-24

Q-3 Answer the following questions (Any 2): **16**

a. Given a corpus of three documents

D_1: *"cat sat mat"*
D_2: *"mat rat cat"*
D_3: *"rat eat tap"*

calculate the Bag-of-Words (BoW) vector and TF-IDF vector for each document of corpus.

b. Consider the following corpus.

- robin *(N) bolt (N) can (M) meet (V)* may *(N)*
- *will (M) jane (N) spot (V) marry (N)*
- *jane (N) will (M) marry (V) robin (N)*
- *marry (N) will (M)* see *(V) bolt (N)*

Calculate Emission and transition probability of it.

c. Consider the following data.

tag	Documents
–	just boring as usual
–	entirely predictable and lacks energy
+	laughs and lots of surprises
+	very interesting
+	the film was funny till the end

Check whether "*interesting and funny*" is positive or negative using naïve bayes

SECTION – II

Q-4 Answer the following questions (Any 3): **9**

a. What is Text summarization? Explain its types: Extractive and Abstractive.

b. What is word embedding and how it better than BOW and TF-IDF in vectorization, write comparison in table.

c. Explain Word2Vec for word embedding in detail. Explain CBOW and Skip gram variants.

d. Explain top-down and bottom-up approach in constituent parsing?

Q-5 Answer the following question **10**

a. Explain RNN and how it is useful language modelling. Explain GRU in detail with proper diagram of gates and working flow.

OR

b. Explain RNN and how it is useful for sequence text classification. Explain LSTM in detail with proper diagram of gates and working flow.

Q-6 Answer the following questions (Any 2): **16**

a. Explain the application of Feed forward neural network in the field of NLP.

E 1563-B

b. Given the context grammar:
CFG: {

$$S \rightarrow NP\ VP$$
$$S \rightarrow VP\ NP$$
$$NP \rightarrow DET\ NP$$
$$NP \rightarrow PP\ NP$$
$$VP \rightarrow V\ NP$$
$$NP \rightarrow book \mid ticket \mid delhi$$
$$V \rightarrow book \mid hold$$
$$DET \rightarrow a \mid an \mid the$$
$$PP \rightarrow of \mid on \mid at$$

}

Implement constituent parsing using CKY algorithm and construct the respective table as well for *"book a ticket of delhi"*.

c. Write the process in detail to develop an end-to-end language model using Sequential models starting from the corpus mention all the relevant steps of processing, data preparation and working flow of model.