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**SMT. INDIRA GANDHI COLLEGE OF ENGINEERING**

An Autonomous Institute with NAAC 'A' Grade  
Approved by AICTE, Affiliated to the University of Mumbai.



**END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME)**

QP Code: 4271153

Date: ~~15/09/2025~~ 06/11/2025

Sem:VII

Max Marks: 80

Subject Name : Disaster Management and Mitigation Measures

Subject Code: ILO7017

Branch: CSE-AIML

Duration:3 Hrs

**Note:**

- 1) Attempt all questions.
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks.

	CO	Marks
<b>Q.1 Answer the following (any two)</b>	1	8
a. Discuss the Direct and indirect effects of disasters.		4
b. Global aid Organizations in crisis response.		4
c. Evolving approaches to Disaster Management in India		4
<b>Q.2 Answer the following (any two)</b>	2	18
a. Define early warning systems and illustrate their benefits through recent instances of flood, cyclone and tsunami alerts.		9
b. Explain the types of landslide and factors affecting them. Give a case study for the same.		9
c. Describe types of manmade disasters. Explain any one in detail.		9
<b>Q.3 Answer the following (any two)</b>	3	12
a. Explain in detail Paradigm shift in disaster management.		6
b. Leveraging technology for disaster preparedness.		6
c. Explain the Importance of disaster management policy.		6
<b>Q.4 Answer the following (any two)</b>	4	12
a. Explain roles and responsibilities of NDMA in detail.		6
b. What are different government agencies responsible for various types?		6
c. Describe the institutional mechanism setup in India.		6
<b>Q.5 Answer the following (any two)</b>	5	18
a. What is role of NGOs in disaster management? Enlist major NGOs working on disaster Management.		9
b. Describe the importance and methods to create public awareness in disaster Management.		9
c. Propose strategies for funding disaster relief efforts and discuss legal considerations.		9
<b>Q.6 Answer the following (any two)</b>	6	12
a. Discuss the role of GIS and Remote Sensing in disaster management.		6
b. What is Community Base Disaster Management (CBDM)? Discuss how it is useful in Indian Scenario.		6
c. Explain Bio shield and Sea wall in detail with schematic diagram.		6



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## END SEMESTER EXAMINATION(SIGCE R-19 C Scheme)

QP Code: 432711421

Subject Name: Blockchain Technologies

Date: 04/11/2025

Subject Code: CSD07022

Branch: CSE-AIML

Sem: VII

Duration: 3 hrs

Max Marks: 80

### Note:

- 1) Attempt all questions.
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks.

	CO	Marks
<b>Q.1 Answer the following (any two)</b>	<b>CO1</b>	<b>10</b>
a. Explain the evolution of Blockchain technology from Bitcoin to modern applications.		05
b. Discuss the key fundamental concepts of blockchain that make it a trusted distributed system.		05
c. What are the main components of a blockchain system? Explain their roles		05
<b>Q.2 Answer the following (any two)</b>	<b>CO2</b>	<b>10</b>
a. What is the Byzantine Generals Problem? How does blockchain solve this issue?		05
b. Explain the working principle of Proof of Work (PoW) consensus algorithm.		05
c. Compare and contrast Proof of Stake (PoS) and Proof of Authority (PoA) mechanisms.		05
<b>Q.3 Answer the following (any two)</b>	<b>CO3</b>	<b>20</b>
a. Explain the complete architecture of Ethereum. Discuss its major components — Ethereum Virtual Machine (EVM), nodes, accounts, gas mechanism, and consensus protocols — with a neat diagram.		10
b. Describe in detail the working of a transaction in Ethereum. Explain all steps from transaction creation to inclusion in a block, with reference to gas and nonce.		10
c. Describe the setup and development process of Smart Contracts using Solidity. Include the installation of tools, compilation, deployment, and execution steps.		10
<b>Q.4 Answer the following (any two)</b>	<b>CO4</b>	<b>20</b>
a. Explain the key characteristics and architecture of a Private Blockchain. How does it differ fundamentally from public blockchains in terms of access, governance, and performance?		10



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- b. Compare and contrast Private, Public, and Consortium blockchains with respect to scalability, security, decentralization, and consensus requirements. 10
- c. Write a detailed note on Hyperledger Fabric. Explain its architecture, transaction flow, and how it ensures confidentiality and scalability in enterprise blockchain systems. 10
- Q.5 Answer the following (any two) CO5 10**
- a. What are ERC20 and ERC721 tokens? Explain the difference between them. 05
- b. Define cryptocurrency. Explain its main features and usage in today's digital economy. 05
- c. Differentiate between Hot Wallets and Cold Wallets used for storing cryptocurrencies. 05
- Q.6 Answer the following (any two) CO6 10**
- a. Explain how Blockchain technology can be applied in the education sector for securing academic records and certificates. 05
- b. Explain the applications of Blockchain in the healthcare industry for maintaining patient data privacy and interoperability. 05
- c. List and explain any two emerging blockchain platforms and their unique features. 05





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## END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME)

QP Code: 42711413

Subject Name-User Experience Design with VR

Date: 04/11/2025

Subject Code:CSD07021

Branch:CSE-AIML

Sem:VII

Duration:3hr

Max Marks: 80

### Note:

- 1) Attempt all questions
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks

CO Marks

### Q.1 Answer the following (any two)

CO1 10

- a. Discuss the Core Elements of User Experience (UX). Explain how these elements work together to influence the overall working of UX elements in an application. 5
- b. Explain user's conceptual cognition. 5
- c. Explain the concept of users' mental models and its significance in interface design. 5

### Q.2 Answer the following (any two)

CO2 20

- a. Explain the UX design process in detail. Discuss each stage with suitable examples of how they contribute to creating a successful user experience. 10
- b. What are mental models in UX design? Explain how understanding users' mental models help in creating intuitive interfaces. 10
- c. Describe the steps involved in creating wireframes and prototypes. Compare low-fidelity and high-fidelity prototypes with examples. 10

### Q.3 Answer the following (any one)

CO3 10

- a. Discuss the complete usability testing process from defining test objectives to reporting results. 10
- b. Define prototyping in UX design. Discuss its importance in validating design ideas before full-scale implementation. 10

### Q.4 Answer the following (any two)

CO4 10

- a. What are usability test findings? 5
- b. Explain how continuous improvement is achieved through iteration and user feedback. 5
- c. Explain the importance of iteration in the UX design process. 5

### Q.5 Answer the following (any two)

CO5 20

- a. Define Virtual Reality (VR). Explain its main characteristics and how it differs from Augmented Reality (AR) and Mixed Reality (MR). 10
- b. Describe the key elements of a Virtual Reality experience. Explain how these elements work together to create a sense of presence and realism. 10



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- c. Discuss the working and significance of visual, aural, and haptic displays in enhancing the realism of VR experiences. Provide examples of each. 10

**Q.6 Answer the following (any one) C06 10**

- a. Discuss the factors that make an application a good candidate for Virtual Reality. What characteristics should a real-world scenario have to benefit from VR implementation? 10
- b. Discuss the recent trends in Virtual Reality application development. How are advancements like AI, cloud computing, and 5G influencing VR experiences? 10





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## END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME)

Subject Name: AI FOR HEALTHCARE

Subject Code: CSDO7012

Branch: CSE (AIML)

Duration: 03 Hours

QP Code: 42711323  
Date: 01/11/2025

Sem: VII

Max Marks: 80

### Note:

- 1) Attempt all questions
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks

CO Marks

### Q.1 Answer the following (any two)

1 12

- a. Discuss the various applications of Artificial Intelligence (AI) in the healthcare domain. Elaborate each category of application with appropriate real-world examples. 6
- b. What are different key challenges of Using AI in healthcare? Explain them in brief. 6
- c. Explain the key applications of AI in healthcare with suitable examples, focusing on: 6
  - a) Disease Prediction
  - b) Diagnosis
  - c) Personalized Treatment and Behaviour Modification
  - d) Drug Discovery
  - e) Follow-up Care

### Q.2 Answer the following (any two)

2 16

- a. What is Deep learning? Describe different Deep learning methods in Brief with example. 8
- b. What are different types of Ensemble Learning? Explain their types in Brief with a suitable example. Compare bagging and boosting methods with suitable example. 8
- c. Example following Medical Applications 8
  - a. Multiagent Infectious Disease Propagation and Outbreak Prediction
  - b. Automated Amblyopia (Lazy Eye) Screening System
  - c. Anticancer Drug Design and High-Throughput Screening
  - d. Genetic Sequence Classification

### Q.3 Answer the following (any two)

3 10

- a. Calculate Accuracy, Precision, Recall and F1-Score with the help of following data: True Positive (TP) =105, TN=50, FP =10, FN=1 5
- b. Find out RMSE, SSR, R-Square error for the following data. Explain their importance. 5

x	y
3	22
5	24
5	28
7	20
9	28
12	31
14	37
17	33



- c. What are hyper parameters? Differentiate hyper parameters and model parameters. Explain any two hyperparameters tuning algorithms with suitable example. 5
- Q.4 Answer the following (any two) 4 16**
- a. Describe Following Low-level NLP components in brief. 8
- Tokenization
  - Sentence Boundary Detection
  - Part-of-Speech Tagging.
  - Shallow Parsing
  - Deep Parsing.
- b. Explain following Clinical NLP resources and Tools in brief. 8
- UMLS
  - Corpora
  - SPECIALIST NLP Tools
  - MetaMap
  - SemRep
- c. What is Model Interpretability using Explainable AI for NLP applications? 8
- Q.5 Answer the following (any two) 5 10**
- a. Draw and explain Architecture of the intelligent personal health record system. 5
- b. Describe intelligent Personal Healthcare Record system for providing function related recommending home health products. 5
- c. What are different functions that iPHR system provides covering health issues? Explain them in brief. 5
- Q.6 Answer the following (any two) 6 16**
- a. What is purpose of Digital Health or digital Therapeutics? How it can be used to deliver personalized medicine to patients. 8
- b. Explain following applications of Virtual and augmented realities used in health care systems. 8
- Pain management
  - Physical Therapy
  - Cognitive rehabilitation
  - Nursing and delivery of medicines
  - Virtual appointments and classrooms
- c. Explain in brief Case Studies on use of AI and ML for Disease Risk Diagnosis from patient data. 8



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**END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME)**

QP Code: 42711313

Subject Name: Natural Language Processing

Subject Code: CSDO7011

Branch: CSE-AIML

Duration: 3 Hours

Date: 01/11/2025

Sem: VII

Max Marks: 80

**Note:**

- 1) Attempt all questions
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks

	CO	Marks
<b>Q.1 Answer the following (any two)</b>	<b>CO1</b>	<b>8</b>
a. Explain the need for NLP in modern applications.		4
b. Discuss the levels of NLP and the challenges associated with each.		4
c. List and explain the applications of NLP.		4
<b>Q.2 Answer the following (any three)</b>	<b>CO2</b>	<b>18</b>
a. Explain Lemmatization and how it differs from stemming.		6
b. Explain derivational and reflectional morphology.		6
c. Explain language models: unigram and bigram approaches.		6
d. Describe finite state transducers with examples.		6
<b>Q.3 Answer the following (any three)</b>	<b>CO3</b>	<b>18</b>
a. Explain rule-based POS tagging.		6
b. Explain Transformation Based POS Tagging.		6
c. Compare Hidden Markov Models and Conditional Random Fields in NLP tasks.		6
d. Explain Part-of-Speech (POS) tagging and the Penn Treebank Tag Set for English.		6
<b>Q.4 Answer the following (any three)</b>	<b>CO4</b>	<b>18</b>
a. How does unsupervised Hyperlex contribute to word sense disambiguation?		6
b. What is lexical semantics? How is it different from compositional semantics?		6
c. Explain the Lesk algorithm for word sense disambiguation (WSD).		6
d. Discuss homonymy, polysemy, and synonymy with examples.		6
<b>Q.5 Answer the following (any two)</b>	<b>CO5</b>	<b>12</b>
a. What is the Reference Phenomena in NLP? Explain with examples.		6
b. Explain Anaphora Resolution using Hobbs algorithm.		6
c. Explain the Canterling Algorithm in discourse resolution.		6
<b>Q.6 Answer the following (any one)</b>	<b>CO6</b>	<b>06</b>
a. How do question answering systems work in natural language processing?		6
b. Explain linguistic modelling in NLP		6



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**END SEMESTER EXAMINATION 2025 (SIGCE R-19 C SCHEME)**

QP Code: 4271121

Subject Name: Big Data Analytics

Date: 30/10/2025

Subject Code: CSC702

Branch: CSE AIML

Sem: VII

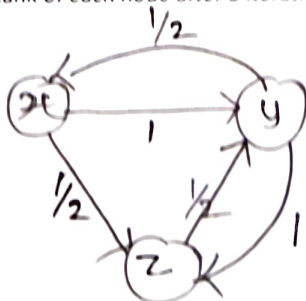
Duration: 3

Max Marks: 80

**Note:**

- 1) Attempt all questions.
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks.

	<b>CO</b>	<b>Marks</b>
<b>Q.1 Answer the following (any three)</b>	<b>CO2</b>	<b>15</b>
a. Explain Components of Hadoop with proper diagram.		5
b. Write short note on Matrix Vector Multiplication by MapReduce.		5
c. What is function of Map Tasks in the Map Reduce framework? Explain with the help of an Example.		5
d. Draw and explain HDFS architecture.		5
<b>Q.2 Answer the following (any one)</b>	<b>CO1</b>	<b>10</b>
a. Explain how big data problems are handled by Hadoop system, Mention four characteristics of big data and explain in detail.		10
b. Define Big data and what are the benefits of Big Data? Discuss challenges under Big Data.		10
<b>Q.3 Answer the following (any two)</b>	<b>CO4</b>	<b>20</b>
a. Suppose the stream is 1, 3, 2, 1, 2, 3, 4, 3, 1, 2, 3, 1. Let $h(x) = 6x + 1 \pmod 5$ . Show how the Flajolet- Martin algorithm will estimate the number of distinct elements in this stream.		10
b. With a neat sketch, Explain the architecture of the data-stream management system.		10
c. Explain Sampling Data techniques in a Stream? What are Issues in Stream Processing?		10
<b>Q.4 Answer the following (any one)</b>	<b>CO5</b>	<b>10</b>
a. Write short note on different distance measures.		10
b. Define Euclidean Distance? Consider two points (8,4) and (5,6) in two-dimensional Euclidean space. Find the Euclidean Distance between them.		10
<b>Q.5 Answer the following (any one)</b>	<b>CO3</b>	<b>10</b>
a. Write a note on Use of NoSQL in Industry.		10
b. Explain NoSQL Data Architecture Patterns.		10
<b>Q.6 Answer the following (any three)</b>	<b>CO6</b>	<b>15</b>
a. How recommendation is done based on properties of product? Elaborate with a suitable example.		5
b. Explain Girvan- Newman algorithm to mine social Graphs.		5
c. What is Social-Network? Explain any one type in detail.		5
D. Compute Page Rank of each node after 3 iterations.		5





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**END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME)**

QP Code:4271112

Subject Name: Deep Learning

Date: 28/10/2025

Subject Code:CSC701

Branch:CSE-AIML

Sem: VII

Duration:3Hrs

Max Marks: 80

**Note:**

- 1) Attempt all questions
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks

**CO Marks**

**Q.1 Answer the following (any two)**

**CO1 10**

- a. Explain the structure and working of a Multilayer Perceptron (MLP).
- b. What are the three classes of Deep Learning networks?
- c. Explain Sigmoid Neurons with mathematical representation and graph.

5

5

5

**Q.2 Answer the following (any three)**

**CO2 18**

- a. What are different types of Regularisation Methods used in Deep learning. Discuss in brief about L1, L2 Regularization.
- b. Draw and explain Multi Layered Feed Forward Neural Network in brief.
- c. Explain Overview of Overfitting and under fitting problems in deep learning.
- d. Explain:i) Stochastic and Mini Batch GD ii) Momentum Based GD iii) Nesterov Accelerated GD.

6

6

6

6

**Q.3 Answer the following (any two)**

**CO2 12**

- a. What is Denoising Autoencoders? Explain in brief. Explain Application of Autoencoders as denoising.
- b. Elaborate undercomplete and overcomplete autoencoders with neat diagrams?
- c. Explain Application of Autoencoders as Image Compression.

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**Q.4 Answer the following (any two)**

**CO3 14**

- a. Draw and explain CNN architecture and different components used in CNN.

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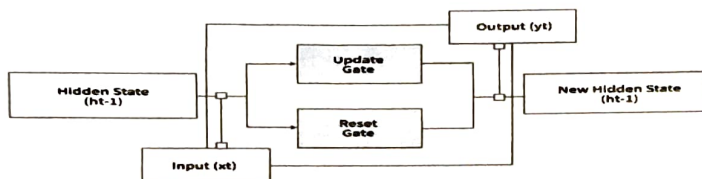


b. Calculate the dimension of the output feature map if an input image of size  $32 \times 32 \times 3$  is convolved with 10 filters, each of size  $5 \times 5 \times 3$ , using stride = 1 and padding = 2. 7

c. Explain Modern Deep Learning Architectures: LeNET Architecture and its application. 7

**Q.5 Answer the following (any two)** **CO3 16**

a. 8



Explain Architecture, working and real world examples of the above diagram.

b. Explain LSTM Architecture, working and real world examples of the above diagram. 8

c. Describe Vanishing and Exploding Gradient Problem in RNN. 8

**Q.6 Answer the following (any two)** **CO4 10**

a. Draw and explain Generative Adversarial Network (GAN) Architecture. 5

b. How are deepfakes commonly used? Explain its use cases. 5

c. Describe the process of Image Generation using GANs. 5