Registration No.: | | | | | | | | | | |

Total Number of Pages: 02 **Course: MCA**

Sub_Code: MCPE2013

4th Semester Regular Examination: 2025-26

SUBJECT: DEEP LEARNING

BRANCH(S): MCA

Time: 3 Hours

Max Marks: 100

Q.Code: V013

Answer Q1 (Part-I) which is compulsory, any eight from Part-II, and any two from Part-III.

The figures in the right-hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

- **a)** State the role of layers in transforming input data in deep networks.
- **b)** Identify the purpose of activation functions in nonlinear modeling.
- **c)** Distinguish between model parameters and hyperparameters with an example.
- **d)** Define Restricted Boltzmann Machine in probabilistic terms.
- **e)** Differentiate between standard autoencoders and variational autoencoders.
- **f)** State the function of the generator and discriminator in GANs.
- **g)** State the purpose of filters/kernels in CNNs.
- **h)** List the different data types processed by CNNs.
- **i)** Define sequence modeling in deep learning.
- **j)** List the purpose of recurrent neural networks.

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

- **a)** A deep network suffers from vanishing gradients; analyze causes and suggest architectural improvements.
- **b)** Compare different activation functions and evaluate their suitability for various tasks.
- **c)** A model fails to converge due to an improper learning rate; describe corrective strategies.
- **d)** Illustrate the relationship between loss functions and optimization objectives.
- **e)** Describe Deep Belief Networks and their significance in unsupervised learning.
- **f)** A GAN fails to generate realistic images; analyze possible reasons and remedies.
- **g)** Explain how unsupervised pretraining improves deep network initialization.
- **h)** Compare deterministic and probabilistic generative models.
- **i)** Describe structured output prediction using CNNs.
- **j)** Compare CNNs with fully connected networks for image tasks.
- **k)** Compare different gated RNN architectures and their applications.
- **l)** A chatbot system uses sequence-to-sequence models; evaluate its design and performance issues.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3	Design a deep neural network architecture for a classification problem and justify each component. Compare linear and non-linear transformations in deep networks.	**(16)**
Q4	Present a comparative study of autoencoders, VAEs, and GANs with suitable diagrams and applications. A company uses GANs for synthetic data generation; evaluate the benefits and risks.	**(16)**
Q5	Describe the neuroscientific basis of CNNs and their relevance to artificial vision systems. Compare different variants of convolution functions.	**(16)**
Q6	Present a detailed analysis of sequence modeling using RNNs, LSTMs, and encoder-decoder architectures with suitable diagrams.	**(16)**

Registration No.: | | | | | | | | | | |

Total Number of Pages: 02 **Course: MCA**

Sub_Code: MCPE2022

4th Semester Regular Examination: 2025-26
SUBJECT: Cyber Security and Cyber Laws
BRANCH(S): MCA
Time: 3 Hours
Max Marks: 100
Q.Code: V059

Answer Q1 (Part-I) which is compulsory, any eight from Part-II, and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Differentiate between threat and vulnerability.
b) What are the different types of firewalls used in practice?
c) Describe the working mechanism of RFID.
d) How viruses are different from worm? Give one example of each.
e) What is buffer overflow? How they can be dangerous to systems?
f) How Static and Dynamic Analysis Help in Security?
g) How Swap Analysis Helps in Cyber Forensics?
h) Explain the concept of OS hardening and its importance in cybersecurity.
i) What is jurisdiction in cyber law?
j) Why is the IT Act considered insufficient for modern cybercrimes?

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Explain different methods of ensuring data integrity and non-repudiation.
b) Explain hashing and digital signatures with examples.
c) Differentiate between Symmetric key and Asymmetric Key Algorithms. Name two algorithms of each type.
d) Describe the RSA algorithm in detail, including key generation, encryption, and decryption process.
e) Discuss the role of hypervisors in virtualization.
f) Discuss the major amendments made to the IT Act 2000 and their significance.
g) Explain privacy and security challenges in IoT systems.
h) Compare cyber laws of India with international regulations such as GDPR.
i) Discuss different techniques for memory acquisition in digital forensics.
j) Describe the process of packet capture and traffic analysis in network forensics.
k) Explain the working of Distributed Denial-of-Service (DDoS) attacks and their impact.
l) Explain the concept of code obfuscation and its detection methods.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3	Discuss the lifecycle of a cyber-attack, from vulnerability discovery to exploitation and impact, along with mitigation strategies.	**(16)**
Q4	Explain SQL injection attacks, types, working, real-world examples, and preventive measures.	**(16)**
Q5	Explain the key provisions of the Information Technology Act, 2000, including its objectives and scope.	**(16)**
Q6	Explain the working of DNS and DNS resolution process, including types of DNS servers. Discuss DNS security issues and attacks, along with mitigation techniques.	**(16)**