MCA.III/11.24.006 Reg.

B

MCA DEGREE THIRD SEMESTER EXAMINATION, NOVEMBER 2024
22-382-0323 DEEP LEARNING
(Supplementary)

Write any FIVE questions.
(Each Question Carries 10 Mark)

Time-3 Hours **Maximum Marks :50**

Q.No		QUESTIONS	MARKS	CO	BL	PI
1.	a.	Explain the role of Hyperparameter tuning in optimising neural network performance	5	CO1	L2	1.6.1
	b.	What is overfitting in neural networks? Explain how regularisation techniques help in preventing overfitting in deep learning models.	5	CO1	L2	1.6.1
		OR				
2.	a.	Describe the process of training a Multi-layer Perceptron (MLP) and explain how backpropagation works in updating the weights.	5	CO1	L2	1.4.1
	b.	Explain the process of training a logistic regression model and its application in binary classification problems.	5	CO1	L2	1.6.1
3.	a.	Explain the concept of convolution in the context of convolutional neural networks (CNNs). How do convolution operations help in feature extraction from images?	5	CO2	L2	1.4.1
	b.	Explain how Residual Networks (ResNet) use skip connections to facilitate the training of highly complex networks. How do these skip connections help in overcoming the vanishing gradient problem during backpropagation?	5	CO2	L2	1.6.1
		OR				
4.	a.	Explain the architecture of VGG16. What are the key components of the network, and how does it differ from other convolutional neural networks (CNNs) like AlexNet?	5	CO2	L2	1.6.1

	b.	.A retail company wants to automate the process of sorting customer images into categories such as "Clothing," "Footwear," and "Accessories" using a deep learning model. They are considering using a Convolutional Neural Network (CNN) for image classification. Based on your understanding of CNNs, answer the following: I. Explain how a CNN can be applied to classify the images in this case study. II. What preprocessing steps would be necessary before feeding the images into the CNN model?	5	CO2	L2	1.6.1
5.		Autoencoders often face the challenge of reconstructing complex data distributions accurately. Propose modifications or additional components that could be integrated into the basic architecture of a Vanilla Autoencoder to improve its performance on high-dimensional data	10	CO3	L3	2.8.3
		OR				
6.		A company specializing in graphic design wants to use Generative Adversarial Networks (GANs) to automatically generate high-quality artwork based on a set of sample designs provided by human artists. They aim to reduce the manual work involved in creating new artwork while maintaining the artistic style and creativity of the original designs. Explain how a GAN can be used to generate new artwork based on the sample designs provided by the artists.	10	CO3	L2	2.6.4
7.		Explain the working of the Attention mechanism. How does it improve the performance of sequence-to-sequence models?	10	CO4	L2	1.4.1
		OR				
8.	a.	Explain the architecture and functioning of a basic LSTM cell	5	CO4	L2	1.4.1
	b.	Describe the main components of the Transformer architecture.	5	CO4	L2	1.4.1

		Compare and contrast Principal Component Analysis (PCA) and Self-Organizing Maps (SOMs) in terms of their approaches to dimensionality reduction and data representation. What are the advantages and limitations of each method?	10	CO5	L2	1.6.1
		OR				
10	a.	What is the exploration-exploitation tradeoff in the context of reinforcement learning (RL)? Suggest a method for addressing this tradeoff and explain how it balances exploration and exploitation.Identify the two main approaches for solving reinforcement learning problems. Explain them briefly.	5	CO5	L2	1.6.1
	b.	What is Q-learning? Explain the Q-Learning algorithm in detail. What is a limitation of this method and how can we overcome it?	5	CO5	L2	1.6.1

BL-Bloom's Taxonomy Levels

1: Remembering, 2: Understanding, 3: Applying, 4: Analysing, 5: Evaluating, 6: Creating

CO- Course Outcomes.

PO- Program Outcomes.

PI code-Performance Indicator Code.

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MCA.III/11.24.004 Reg.

B

MCA DEGREE THIRD SEMESTER EXAMINATION, NOVEMBER 2024
22-382-0350 DEEP LEARNING
(Regular)

Write any FIVE questions.
(Each Question Carries 10 Mark)

Time-3 Hours **Maximum Marks :50**

Q.No		QUESTIONS	MARKS	CO	BL	PI
1.	a.	Explain the role of Hyperparameter tuning in optimising neural network performance	5	CO1	L2	1.6.1
	b.	What is overfitting in neural networks? Explain how regularisation techniques help in preventing overfitting in deep learning models.	5	CO1	L2	1.6.1
		OR				
2.	a.	Describe the process of training a Multi-layer Perceptron (MLP) and explain how backpropagation works in updating the weights.	5	CO1	L2	1.4.1
	b.	Explain the process of training a logistic regression model and its application in binary classification problems.	5	CO1	L2	1.6.1
3.	a.	Explain the concept of convolution in the context of convolutional neural networks (CNNs). How do convolution operations help in feature extraction from images?	5	CO2	L2	1.4.1
	b.	Explain how Residual Networks (ResNet) use skip connections to facilitate the training of highly complex networks. How do these skip connections help in overcoming the vanishing gradient problem during backpropagation?	5	CO2	L2	1.6.1
		OR				
4.	a.	Explain the architecture of VGG16. What are the key components of the network, and how does it differ from other convolutional neural networks (CNNs) like AlexNet?	5	CO2	L2	1.6.1

	b.	.A retail company wants to automate the process of sorting customer images into categories such as "Clothing," "Footwear," and "Accessories" using a deep learning model. They are considering using a Convolutional Neural Network (CNN) for image classification. Based on your understanding of CNNs, answer the following: I. Explain how a CNN can be applied to classify the images in this case study. II. What preprocessing steps would be necessary before feeding the images into the CNN model?	5	CO2	L2	1.6.
5.		Autoencoders often face the challenge of reconstructing complex data distributions accurately. Propose modifications or additional components that could be integrated into the basic architecture of a Vanilla Autoencoder to improve its performance on high-dimensional data	10	CO3	L3	2.8.3
		OR				
6.		A company specializing in graphic design wants to use Generative Adversarial Networks (GANs) to automatically generate high-quality artwork based on a set of sample designs provided by human artists. They aim to reduce the manual work involved in creating new artwork while maintaining the artistic style and creativity of the original designs. Explain how a GAN can be used to generate new artwork based on the sample designs provided by the artists.	10	CO3	L2	2.6.4
7.		Explain the working of the Attention mechanism. How does it improve the performance of sequence-to-sequence models?	10	CO4	L2	1.4.1
		OR				
8.	a.	Explain the architecture and functioning of a basic LSTM cell	5	CO4	L2	1.4.1
	b.	Describe the main components of the Transformer architecture.	5	CO4	L2	1.4.1

		Compare and contrast Principal Component Analysis (PCA) and Self-Organizing Maps (SOMs) in terms of their approaches to dimensionality reduction and data representation. What are the advantages and limitations of each method?	10	CO5	L2	1.6.1
		OR				
10	a.	What is the exploration-exploitation tradeoff in the context of reinforcement learning (RL)? Suggest a method for addressing this tradeoff and explain how it balances exploration and exploitation.Identify the two main approaches for solving reinforcement learning problems. Explain them briefly.	5	CO5	L2	1.6.1
	b.	What is Q-learning? Explain the Q-Learning algorithm in detail. What is a limitation of this method and how can we overcome it?	5	CO5	L2	1.6.1

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PO- Program Outcomes.

PI code-Performance Indicator Code.

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MCA.III/11.24.005 Reg.No.

B

MCA DEGREE THIRD SEMESTER EXAMINATION, NOVEMBER 2024
22-382-0344 CLOUD COMPUTING
(Regular)

Write any FIVE questions.
(Each Question Carries 10 Mark)

Time-3 Hours **Maximum Marks :50**

Qn No		Questions	Marks	CO	BL	PI
1		Explain different types of multiprocessors based on their memory organization.	10 -	CO1	L2	1.4.1
		OR				
2		Define Cloud computing, explain its Architecture.	10	CO1	L2	1.4.1
3	a	Explain the key differences between Public, Private, Hybrid, and Community cloud deployment models.	5	CO2	L2	1.6.1
	b	Discuss the differences between Software as a Service (SaaS), Infrastructure as a Service (IaaS), and Platform as a Service (PaaS).	5	CO2	L2	1.6.1
		OR				
4		Describe how SOA enables different systems to communicate and work together within a cloud environment.	10	CO2	L2	1.6.1
5	a	Write short note on the 5 key components of Cloud Computing Security Architecture.	5	CO4	L2	1.4.1
	b	Write a note on side channel attacks against cloud and the defensive mechanisms that can be adapted.	5	CO4	L3	1.7.1
		OR				
6	a	What are the risks and threats that can be encountered in virtualization?	5	CO4	L3	1.7.1
	b	Describe the different ways in which virtualization security can be provided.	5	CO4	L3	1.7.1

7	a	Describe how virtualization enables efficient resource utilization in cloud environments and its role in supporting cloud services.	5	CO3	L2	1.6.1
	b	Differentiate between full virtualization and paravirtualization with suitable examples.	5	CO3	L2	1.6.1
		OR				
8	a	Compare and contrast Type 1 and Type 2 hypervisors, discussing their architectures, performance characteristics, and typical usecases.	5	CO3	L2	2.6.4
	b	What is VMware ESXi, and how does it differ from a traditional operating system?	5	CO3	L2	1.4.1
9	a	Discuss the advantages and challenges of using NoSQL systems in cloud-based applications, particularly in handling unstructured and semi-structured data.	5	CO5	L2	1.6.1
	b	What is Hadoop? Explain the Hadoop ecosystem and its components, with a specific focus on the Hadoop Distributed File System (HDFS).	5	CO5	L2	2.5.3
		OR				
10		Explain the concept of containerization and discuss the role of Docker in simplifying application deployment.	10	CO5	L2	1.4.1

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MCA.III/11.24.001 Reg.No. | | | | | | | | |

C

MCA DEGREE THIRD SEMESTER EXAMINATION, NOVEMBER 2024

22-382-0301 WEB TECHNOLOGIES AND PROGRAMMING

(Regular)

Write any FIVE questions.
(Each Question Carries 10 Mark)

Time-3 Hours **Maximum Marks :50**

Q.No		QUESTIONS	MARKS	CO	BL	PI
1.	a.	Design a registration form for IRCTC railway reservation with the following fields (Name, Age, Gender, Starting station, Destination station, Train, Coach type, Number of Passengers). Add appropriate background colour and image. The page should display the availability of seat in each category (1AC, 2AC, 3AC, SL, etc.].	6	CO6	L6	4.4.2
	b.	Discuss the significance of headings, spacing, images, and links in HTML and provide relevant examples.	4	CO1	L2	1.6.1
		OR				
2.	a.	Describe how to create dynamic web pages using Java and explain its advantages in web development.	5	CO1	L3	1.6.1
	b.	Explain the concepts of CSS cascading and inheritance with examples of common CSS attributes.	5	CO1	L3	1.6.1
3.	a.	Write a JavaScript function using ***getElementById()*** to modify the content of an HTML element with an example.	6	CO2	L3	1.6.1
	b.	Describe the usage and applications of ***alert, prompt,*** and ***confirm*** windows in JavaScript with examples.	4	CO2	L3	1.6.1
		OR				
4.	a.	Discuss object-oriented programming principles in JavaScript with a practical example.	5	CO2	L4	1.6.1
	b.	Compare and contrast AngularJS, jQuery, and Struts for frontend development, focusing on their key features.	5	CO2	L4	1.6.1

7	a	Describe how virtualization enables efficient resource utilization in cloud environments and its role in supporting cloud services.	5	CO3	L2	1.6.1
	b	Differentiate between full virtualization and paravirtualization with suitable examples.	5	CO3	L2	1.6.1
		OR				
8	a	Compare and contrast Type 1 and Type 2 hypervisors, discussing their architectures, performance characteristics, and typical usecases.	5	CO3	L2	2.6.4
	b	What is VMware ESXi, and how does it differ from a traditional operating system?	5	CO3	L2	1.4.1
9	a	Discuss the advantages and challenges of using NoSQL systems in cloud-based applications, particularly in handling unstructured and semi-structured data.	5	CO5	L2	1.6.1
	b	What is Hadoop? Explain the Hadoop ecosystem and its components, with a specific focus on the Hadoop Distributed File System (HDFS).	5	CO5	L2	2.5.3
		OR				
10		Explain the concept of containerization and discuss the role of Docker in simplifying application deployment.	10	CO5	L2	1.4.1

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MCA.III/11.24.001 Reg.No. | | | | | | | | |

C

MCA DEGREE THIRD SEMESTER EXAMINATION, NOVEMBER 2024

22-382-0301 WEB TECHNOLOGIES AND PROGRAMMING

(Regular)

Write any FIVE questions.
(Each Question Carries 10 Mark)

Time-3 Hours **Maximum Marks :50**

Q.No		QUESTIONS	MARKS	CO	BL	PI
1.	a.	Design a registration form for IRCTC railway reservation with the following fields (Name, Age, Gender, Starting station, Destination station, Train, Coach type, Number of Passengers). Add appropriate background colour and image. The page should display the availability of seat in each category (1AC, 2AC, 3AC, SL, etc.].	6	CO6	L6	4.4.2
	b.	Discuss the significance of headings, spacing, images, and links in HTML and provide relevant examples.	4	CO1	L2	1.6.1
		OR				
2.	a.	Describe how to create dynamic web pages using Java and explain its advantages in web development.	5	CO1	L3	1.6.1
	b.	Explain the concepts of CSS cascading and inheritance with examples of common CSS attributes.	5	CO1	L3	1.6.1
3.	a.	Write a JavaScript function using ***getElementById()*** to modify the content of an HTML element with an example.	6	CO2	L3	1.6.1
	b.	Describe the usage and applications of ***alert, prompt,*** and ***confirm*** windows in JavaScript with examples.	4	CO2	L3	1.6.1
		OR				
4.	a.	Discuss object-oriented programming principles in JavaScript with a practical example.	5	CO2	L4	1.6.1
	b.	Compare and contrast AngularJS, jQuery, and Struts for frontend development, focusing on their key features.	5	CO2	L4	1.6.1

5.	a.	Design a java servlet program to get one string value and three integer values via textboxes from a webpage named calculation.html. If the value of first text box is 'odd_prime', find odd prime numbers among those 3 values, if it is 'four_digit', find the four digit numbers among those.	6	CO4	L6	
	b.	Describe the process of handling sessions and cookies in Java servlets with examples.	4	CO3	L4	1.6.1
		OR				
6.	a.	Develop a jdbc-mysql java servelet based application to facilitate the insertion and retrieval of whole phone_number and email of users entered via two bases in a web page called contact_info. html.	6	CO4	L6	4.4.2
	b.	Explain the steps involved in executing SELECT and UPDATE queries using JDBC in Java.	4	CO3	L3	1.6.1
7.	a.	Develop a jsp based application to facilitate a MCQ based quiz application with a web page named quiz.html containing 4 questions with one correct answer. 4 marks will be awarded if the answer is correct, 1 mark will be deducted if answer is wrong. Total marks have to be displayed to the user.	6	CO4	L6	4.4.2
	b.	Explain how to process HTML form data using JSP, and discuss the significance of JSP Implicit Objects.	4	CO4	L2	1.6.1
		OR				
8.	a.	Use JSP actions to include the output of another JSP file within the current JSP page. Describe the purpose and usage of ***<jsp:include>***	5	CO4	L3	4.4.2
	b.	Explain in detail all the implicit objects in JSP.	5	CO2	L2	1.6.1
9.	a.	Differentiate between XML Schema and Document Type Definition (DTD) with suitable examples.	5	CO5	L4	1.6.1
	b.	Explain XSL and XSLT, focusing on their roles in transforming XML documents.	5	CO5	L4	1.6.1
		OR				

10	a.	Convert the following XML into XSD ship_order.XML <?xml version="1.0"> <shiporder orderid="889923" xsi:noNamespaceSchemaLocation="shiporder.xsd"> <orderperson>John Smith</orderperson> <shipto> <name>Ola Nordmann</name> <address>Langgt 23</address> <city>4000 Stavanger</city> <country>Norway</country> </shipto> <item> <title>Empire Burlesque</title> <note>Special Edition</note> <quantity>1</quantity> <price>10.90</price> </item> <item> <title>Hide your heart</title> <quantity>1</quantity> <price>9.90</price> </item> </shiporder>	6	CO2	L2	1.6.1
	b.	Provide an overview of Django and describe its advantages for Python-based web application development.	4	CO5	L2	1.6.1

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