



SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

SRM Institute of Science and Technology

Engineering and Technology

School of Computing

DEPARTMENT OF COMPUTATIONAL INTELLIGENCE

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Academic Year: AY2023-24-ODD set A

Mode of Exam

OFFLINE

Test: CLAT-3

Date: 02/11/2023

Course Code & Title: 18AIC301J, Deep Learning Techniques.

Duration: 90 minutes

Year & Sem: 3rd year, Vth sem

Max. Marks: 50

Course Articulation Matrix: (to be placed)

Course Learning Rationale (CLR):		Learning			Program Learning Outcomes (PLO)														
The purpose of learning this course is to:		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-1:	Illustrate the basic concepts of deep learning																		
CLR-2:	Gain knowledge in Optimization algorithms and dimensionality reduction																		
CLR-3:	Develop a broad understanding of word2vec models and Convolution Neural Network models																		
CLR-4:	Acquire knowledge in Transfer learning and Sequential Models																		
CLR-5:	Implement the attention mechanism and advanced deep learning models																		
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:																	
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
CLO-1:	Understand various deep learning models to solve real world problems	2	85	75	L	H	-	-	-	-	-	-	M	-	-	-	H	M	M
CLO-2:	Compare the optimization algorithms and high dimensional data using reduction techniques	2	80	70	M	M	-	-	-	-	-	-	M	-	-	-	M	L	M
CLO-3:	Implement word2vec models and Convolution Neural Network models	3	85	75	M	H	-	-	-	-	-	-	H	-	-	-	H	M	M
CLO-4:	Apply RNN and transfer learning to real world scenarios	3	85	80	M	H	-	-	-	-	-	-	H	-	-	-	H	M	H
CLO-5:	Use deep learning models to solve real-world applications	3	80	70	M	H	-	-	-	-	-	-	H	-	-	-	L	L	L

Part - A
(10 x1 = 10 Marks)

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	_____ occurs when the gradients become too large due to back-propagation. (a) Exploding Gradients (b) Vanishing Gradients (c) Long Short Term Memory Networks (d) Gated Recurrent Unit Networks	1	1	4	1	1.6.1
2	Which among the following is NOT an application of RNN? (a) Time series prediction (b) Object classification (c) Weather prediction (d) Machine translation	1	2	4	1	1.6.1
3	What is the primary goal of transfer learning in deep learning? a) To transfer knowledge from one domain to another b) To train models from scratch on each new task c) To reduce the size of the neural network d) To improve the learning rate	1	1	4	1	1.6.1
4	What is one of the potential applications of autoencoders? (a) Image classification (b) Natural language processing	1	2	4	2	1.7.1

	(c) Data compression (d) Speech synthesis					
5	Which activation function is commonly used in the encoder and decoder layers of autoencoders? (a) ReLU (Rectified Linear Unit) (b) Sigmoid (c) Tanh (Hyperbolic Tangent) (d) Softmax	1	3	4	2	1.7.1
6	Which of the following is/are Common uses of RNNs? (a) Businesses Help securities traders to generate analytic reports (b) Detect fraudulent credit-card transaction (c) Provide a caption for images (d) All of the above	1	2	5	1	1.6.1
7	A ____ function is then used to convert the similarity scores into attention weight α (a) ReLU (Rectified Linear Unit) (b) Sigmoid (c) Tanh (Hyperbolic Tangent) (d) Softmax	1	1	5	1	1.6.1
8	_____ is the simplest type GAN. (a) Conditional GAN (b) Vanilla GAN (c) Deep Convolutional GAN (d) Laplacian Pyramid GAN	1	2	5	1	1.6.1
9	What is the primary objective of a Generative Adversarial Network (GAN)? a) Image classification (b) Image generation c) Text summarization d) Text translation	1	1	5	1	
10	what consists of Boltzmann Machine (a) Fully connected network with both hidden and visible units (b) Asynchronous operation (c) Stochastic update (d) all the mentioned above	1	3	5	1	1.6.1



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Academic Year: AY2023-24-ODD SET A

Mode of Exam
OFFLINE

Part – B
(4x 5 = 20 Marks)

11	Define Transfer Learning. What is the need of transfer learning? List Out the advantages and disadvantages of transfer learning	5	3	4	2	1.6.1
12	Define exploding gradients and Vanishing Gradients and Illustrate how LSTM helps to solve the Gradients Problems.	5	2	4	2	1.6.1
13	Explain The RBM training with Block Gibbs sampling	5	2	5	2	1.6.1
14	Give the short notes for hierarchical attention in deep learning	5	2	5	2	1.6.1

Part – C
(2x 10 = 20 Marks)

15	Explain in detail the DenseNet architecture. What problems are solved by DenseNet ?	10	3	4	3	1.7.1
OR						
16	Give the Detail explanation for the encoder and decoder Models and list out the applications of Encoder and decoder Models.	10	3	4	3	1.7.1
17	Explain the language modeling with its types and real time examples.	10	3	5	3	1.7.1
OR						
18	Explain Generative adversarial network (GAN) with a neat diagram and list out the types of GAN.	10	3	5	3	1.7.1

***Performance Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.**

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



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Mode of Exam

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Test: CLAT-3

Date: 02/11/2022

Course Code & Title: 18AIC301J, Deep Learning Techniques.

Duration: 90 minutes

Year & Sem: 3rd year, Vth sem

Max. Marks: 50

Course Articulation Matrix: (to be placed)

Course Learning Rationale (CLR):		The purpose of learning this course is to:					Learning				Program Learning Outcomes (PLO)														
CLR-1:	Illustrate the basic concepts of deep learning		1	2	3		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
CLR-2:	Gain knowledge in Optimization algorithms and dimensionality reduction		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)		Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3				
CLR-3:	Develop a broad understanding of word2vec models and Convolution Neural Network models																								
CLR-4:	Acquire knowledge in Transfer learning and Sequential Models																								
CLR-5:	Implement the attention mechanism and advanced deep learning models																								
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:																							
CLO-1:	Understand various deep learning models to solve real world problems	2	85	75		L	H	-	-	-	-	-	-	M	-	-	-	H	M	M					
CLO-2:	Compare the optimization algorithms and high dimensional data using reduction techniques	2	80	70		M	M	-	-	-	-	-	-	M	-	-	-	M	L	M					
CLO-3:	Implement word2vec models and Convolution Neural Network models	3	85	75		M	H	-	-	-	-	-	-	H	-	-	-	H	M	M					
CLO-4:	Apply RNN and transfer learning to real world scenarios	3	85	80		M	H	-	-	-	-	-	-	H	-	-	-	H	M	H					
CLO-5:	Use deep learning models to solve real-world applications	3	80	70		M	H	-	-	-	-	-	-	H	-	-	-	L	L	L					

Part - A
(10 x1 = 10 Marks)

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	In RNN Each unit has an internal state which is called the _____. A.visible state of unit B.hidden state of the unit. C.Visible function D.Hidden function	1	1	4	1	1.6.1
2	Which of the following model is best suited for sequential data? A. Convolutional Neural Networks (ConvNets) B. Capsule Neural Networks (CapsNets) C. RNN (Recurrent Neural Network) D. Autoencoders	1	2	4	1	1.6.1
3	When to use Transfer Learning ? A. Have annotated data	1	1	4	1	1.6.1

	B. Not having annotated data C.both D. None of these					
4	What is the purpose of the backpropagation through time (BPTT) algorithm in RNN training? a) To compute the gradients and update the network's parameters b) To adjust the learning rate during training c) To prevent overfitting by regularizing the model d) None of the above	1	2	4	2	1.7.1
5	Which of the following is FALSE about Forget Gate in LSTM A. It decides what information it needs to forget or throw away B. It outputs a number between 0 and 1 C. 0 represents completely keep this info while 1 represents completely forget this info D. None of the above	1	3	4	2	1.7.1
6	By using which method, boltzman machine reduces effect of additional stable states? A. no such method exist B. simulated annealing C. hopfield reduction D. none of the mentioned	1	2	5	1	1.6.1
7	How are energy minima related to the probability of occurrence of corresponding patterns in the environment? A. directly B. inversely C. directly or inversely D. no relation	1	1	5	1	1.6.1
8	Select the correct option about Restricted Boltzmann Machines (RBM). A. RBM is 'restricted' to have only the connections between the visible and the hidden units. B. RBM performs discriminative learning similar to what happens in a classification problem. C. If number of visible nodes = nV, number of hidden nodes = nH, then number of connections in RBM = nV* nH A.. True, True, True B. True, False, True C. False, False, True D. True, False, False	1	2	5	1	1.6.1
9	Classification problems are distinguished from estimation problems in that A. classification problems require the output attribute to be numeric. B. classification problems require the output attribute to be categorical. C. classification problems do not allow an output attribute. D. classification problems are designed to predict future outcomes.	1	1	5	1	
10	What are the two main steps of the attention mechanism? A) Calculating the attention weights and generating the output word B) Calculating the context vector and generating the output word C) Calculating the attention weights and generating the context vector	1	3	5	1	1.6.1

	D) Calculating the context vector and generating the attention weights					
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Academic Year: AY2023-24-ODD set B

Mode of Exam

OFFLINE

Part – B
(4x 5 = 20 Marks)

11	Explain the concept of RNN with an example.	5	3	4	2	1.6.1
12	What is the use of GRU? Compare with LSTM.	5	2	4	2	1.6.1
13	Illustrate the concept of a latent variable	5	2	5	2	1.6.1
14	Explain Generative adversarial network with a neat diagram.	5	2	5	2	1.6.1

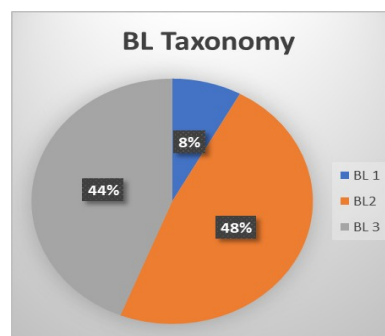
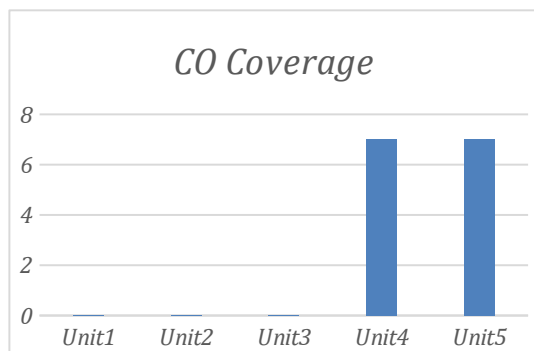
Part – C
(2x 10 = 20 Marks)

15	Explain in detail VGG16 architecture and how the pre-trained model of VGG16 is used for image classification.	10	3	5	3	1.7.1
OR						
16	Draw LSTM architecture and build an LSTM network for named entity recognition.	10	3	5	3	1.7.1
17	Explain Restricted Boltzmann Machines (RBM). How to train the RBM using contrastive divergence? Then how to increase/decrease the probability of a configuration?	10	3	5	3	1.7.1

OR						
18	Which Attention mechanism is used for prediction purposes? Justify..	10	3	5	3	1.7.1

***Performance Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.**

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



Test: CLAT-3

Date: 02/11/2022

Course Code & Title: 18AIC301J, Deep Learning Techniques.

Duration: 90 minutes

Year & Sem: 3rd year, Vth sem

Max. Marks: 50

Course Articulation Matrix: (to be placed)

Course Learning Rationale (CLR):		The purpose of learning this course is to:			Learning			Program Learning Outcomes (PLO)														
CLR-1 :	Illustrate the basic concepts of deep learning				1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	Gain knowledge in Optimization algorithms and dimensionality reduction																					
CLR-3 :	Develop a broad understanding of word2vec models and Convolution Neural Network models																					
CLR-4 :	Acquire knowledge in Transfer learning and Sequential Models																					
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Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:			Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO – 3
CLO-1 :	Understand various deep learning models to solve real world problems				2	85	75	L	H	-	-	-	-	-	-	M	-	-	-	H	M	M
CLO-2 :	Compare the optimization algorithms and high dimensional data using reduction techniques				2	80	70	M	M	-	-	-	-	-	-	M	-	-	-	M	L	M
CLO-3 :	Implement word2vec models and Convolution Neural Network models				3	85	75	M	H	-	-	-	-	-	-	H	-	-	-	H	M	M
CLO-4 :	Apply RNN and transfer learning to real world scenarios				3	85	80	M	H	-	-	-	-	-	-	H	-	-	-	H	M	H
CLO-5 :	Use deep learning models to solve real-world applications				3	80	70	M	H	-	-	-	-	-	-	H	-	-	-	L	L	L

Part - A

(10 x1 = 10 Marks)

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	_____ occurs when the gradients become too large due to back-propagation. (a)Exploding Gradients (b)Vanishing Gradients (c)Long Short Term Memory Networks (d)Gated Recurrent Unit Networks	1	1	4	1	1.6.1
2	Which of the following model is best suited for sequential data? A. Convolutional Neural Networks (ConvNets) B. Capsule Neural Networks (CapsNets) C. RNN (Recurrent Neural Network) D. Autoencoders	1	2	4	1	1.6.1
3	Which of the following types of RNN is also called Vanilla Neural Network? A. One to One B. One to Many C. Many to One D. Many to Many	1	1	4	1	1.6.1
4	Which of the following is FALSE about LSTM? A. LSTM is an extension for RNN which extends its memory B. LSTM enables RNN to learn long-term dependencies C. LSTM solves the exploding gradients issue in RNN D. None of the above	1	2	4	2	1.7.1

5	To which of these tasks would you apply a many-to-one RNN architecture? (a) Gender recognition from speech (input an audio clip and output a label indicating the speaker's gender) (b) Image classification (input an image and output a label) (c) Speech recognition (input an audio clip and output a transcript) (d)None of the above	1	3	4	2	1.7.1
6	The generator G's main goal is (a)Maximize classification error for discriminator (b)Minimize classification error for discriminator (c) Minimize $\log(1 - D(G(z)))$ (d)Maximize $\log(D(G(z)))$	1	2	5	1	1.6.1
7	Classification problems are distinguished from estimation problems in that A. classification problems require the output attribute to be numeric. B. classification problems require the output attribute to be categorical. C. classification problems do not allow an output attribute. D. classification problems are designed to predict future outcome.	1	1	5	1	1.6.1
8	Which among the following is NOT an attention model in neural networks? (a)BERT (b)Transformer (c) GPT (d) RBM	1	1	5	1	1.6.1
9	Which of the following is FALSE about Forget Gate in LSTM? A. It decides what information it needs to forget or throw away B. It outputs a number between 0 and 1 C. 0 represents completely keep this info while 1 represents completely forget this info D. None of the above	1	2	5	1	
10	How accurate will the discriminator be for GAN models at the global optimum? (a) 1 (b) 0.5 (c) $p_{data}/(p_g + p_{data})$ (d)None of those	1	3	5	1	1.6.1



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Academic Year: AY2023-24-ODD set B

Part – B

(4x 5 = 20 Marks)

11	Explain the concept of Backpropagation through time (BPTT). Explain with a neat diagram	5	3	4	2	1.6.1
12	What do you mean by Transfer Learning in neural networks? How it is helpful in improving learning?	5	2	4	2	1.6.1
13	Explain Restricted Boltzmann Machines (RBM).	5	2	5	2	1.6.1
14	Explain machine translation with attention mechanism?	5	2	5	2	1.6.1

Part – C

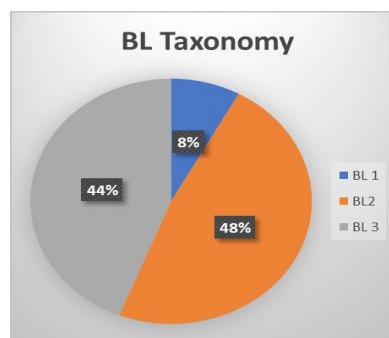
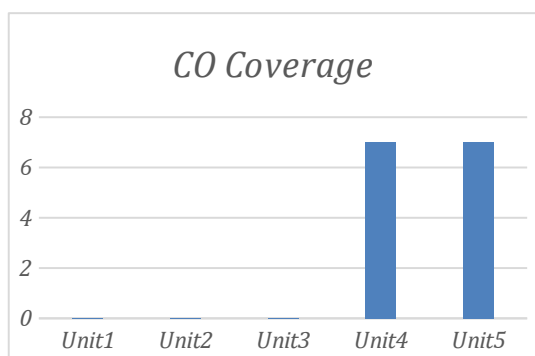
(2x 10 = 20 Marks)

15	Explain image captioning using RNN with algorithms.	10	3	5	3	1.7.1
OR						
16	Explain the architecture of an LSTM network with a neat diagram and mathematical formulations involved.	10	3	5	3	1.7.1

17	Explain the training process of Generative Adversarial Networks in detail. In this regard, mention the two lossess involved in GAN training? Provide the equation for both of them.	10	3	5	3	1.7.1
OR						
18	(i)What do you mean by attention models in neural networks? (ii)Draw the hierarchial attention architecture and explain its working procedure.	10	3	5	3	1.7.1

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Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



Test: CLAT-3

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CLR-2:	Gain knowledge in Optimization algorithms and dimensionality reduction																					
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CLO-1:	Understand various deep learning models to solve real world problems				2	85	75	L	H	-	-	-	-	-	-	M	-	-	-	H	M	M
CLO-2:	Compare the optimization algorithms and high dimensional data using reduction techniques				2	80	70	M	M	-	-	-	-	-	-	M	-	-	-	M	L	M
CLO-3:	Implement word2vec models and Convolution Neural Network models				3	85	75	M	H	-	-	-	-	-	-	H	-	-	-	H	M	M
CLO-4:	Apply RNN and transfer learning to real world scenarios				3	85	80	M	H	-	-	-	-	-	-	H	-	-	-	H	M	H
CLO-5:	Use deep learning models to solve real-world applications				3	80	70	M	H	-	-	-	-	-	-	H	-	-	-	L	L	L

Part - A

(10 x1 = 10 Marks)

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	Which layer type is typically used to capture sequential dependencies in an RNN? a) Input layer b) Hidden layer c) Output layer d) Activation layer	1	1	4	1	1.6.1
2	What is the advantage of using recurrent layers in an RNN? a) They can capture temporal dependencies in the input data b) They can handle variable-length inputs c) They can generate synthetic data d) They can handle non-linear transformations	1	2	4	1	1.6.1
3	Which activation function is commonly used in the recurrent layers of an RNN? a) ReLU (Rectified Linear Unit) b) Sigmoid c) Tanh (Hyperbolic Tangent) d) Softmax	1	1	4	1	1.6.1
4	What is the purpose of the cell state in an LSTM network? a) To store long-term dependencies in the input sequence b) To adjust the learning rate during training	1	2	4	2	1.7.1

	c) To compute the gradients for backpropagation d) None of the above					
5	To which of these tasks would you apply a many-to-one RNN architecture? (a) Gender recognition from speech (input an audio clip and output a label indicating the speaker's gender) (b) Image classification (input an image and output a label) (c) Speech recognition (input an audio clip and output a transcript) (d)None of the above	1	3	4	2	1.7.1
6	What is the primary objective of a Generative Adversarial Network (GAN)? a) Image classification b) Image generation c) Text summarization d) Text translation	1	2	5	1	1.6.1
7	Which loss function is commonly used in GANs? a) Cross-entropy loss b) Mean squared error loss c) Binary logistic loss d) Kullback-Leibler divergence	1	1	5	1	1.6.1
8	Select the correct option about Restricted Boltzmann Machines (RBM). A. RBM is 'restricted' to have only the connections between the visible and the hidden units. B. RBM performs discriminative learning similar to what happens in a classification problem. C. If number of visible nodes = nV, number of hidden nodes = nH, then number of connections in RBM = nV* nH A.. True, True, True B. True, False, True C. False, False, True D. True, False, False	1	1	5	1	1.6.1
9	Which of the following is FALSE about Forget Gate in LSTM? A. It decides what information it needs to forget or throw away B. It outputs a number between 0 and 1 C. 0 represents completely keep this info while 1 represents completely forget this info D. None of the above	1	2	5	1	
10	What are the two main steps of the attention mechanism? A) Calculating the attention weights and generating the output word B) Calculating the context vector and generating the output word C)Calculating the attention weights and generating the context vector D) Calculating the context vector and generating the attention weights	1	3	5	1	1.6.1



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Academic Year: AY2023-24-ODD set D

Mode of Exam

OFFLINE

Part – B

(4x 5 = 20 Marks)

11	Explain language modeling using RNN with an example.	5	3	4	1,2	1.6.1
12	What do you mean by Transfer Learning in neural networks? How it is helpful in improving learning?	5	2	4	1,2	1.6.1
13	Explain Restricted Boltzmann Machines (RBM).	5	2	5	1,2	1.6.1
14	Explain image captioning using RNN with algorithms.	5	2	5	1,2	1.6.1

Part – C

(2x 10 = 20 Marks)

15	Write about encoder decoder architecture of machine translation with an example.	10	3	4	1,3	1.7.1
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OR

16	Explain the architecture of an LSTM network with a neat diagram and mathematical formulations involved and differentiate with GRU.	10	2	4	1,3	1.7.1
17	Explain the training process of Generative Adversarial Networks in detail. In this regard, mention the two lossess involved in GAN training? Provide the equation for both of them.	10	2	5	1,3	1.7.1
OR						
18	What do you mean by attention models in neural networks? Explain attention over images with an example.	10	3	5	1,3	1.7.1

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Course Outcome (CO) and Bloom's level (BL) Coverage in Questions

