

Course Code: B20HS4101					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R20
IV B.Tech I Semester MODEL QUESTION PAPER					
UNIVERSAL HUMAN VALUES-2: UNDERSTANDING HARMONY					
(Common to AIDS, AIMS, CSBS, CSE, CSG, IT & ME)					
Time: 3 Hrs.			Max. Marks:70M		
Answer ONE Question from EACH UNIT					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
<b>UNIT-I</b>					
1	a).	Discuss natural acceptance	1	2	7
	b).	Differentiate prosperity and deprivation	1	2	7
<b>OR</b>					
2	a).	Write a note on physical facilities	1	2	7
	b).	Deliberate the right understanding in perspective to self-exploration.	1	2	7
<b>UNIT-II</b>					
3	a).	Illustrate coexistence of "I" and "Body".	2	2	7
	b).	Explain doer, seer and enjoyer.	2	2	7
<b>OR</b>					
4	a).	Discuss Characteristic activities of Harmony with "I".	2	2	7
	b).	Explain Sanyam and Health.	2	2	7
<b>UNIT-III</b>					
5	a).	Write a note on human-human relationship as regarding harmony.	3	2	7
	b).	Differentiate intention and competence.	3	2	7
<b>OR</b>					
6	a).	Discuss salient values in relationship.	3	2	7
	b).	Illustrate universal Harmonious Society - an Undivided society.	3	2	7
<b>UNIT-IV</b>					
7		Discuss orders of life in nature and its significance self-regulation of individual	4	2	14
<b>OR</b>					
8		Illustrate existence of human being as coexistence with universe in perspective of space	4	2	14
<b>UNIT-V</b>					
9		Discuss importance of professional competence for augmenting universal	5	3	14

		human order.			
		<b>OR</b>			
<b>10</b>	<b>a).</b>	Case study of typical holistic technologies.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Role of engineer in promoting harmony in society	<b>5</b>	<b>3</b>	<b>7</b>
		<b>CO-COURSE OUTCOME</b>	<b>KL-KNOWLEDGE LEVEL</b>	<b>M-MARKS</b>	

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks



## IV B. Tech. I Semester MODEL QUESTION PAPER

## ROBOTIC PROCESS AUTOMATION

## Common to AIML, CSG

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Explain about RPA and compare its benefits with traditional automation techniques.	1	2	7
	b).	Describe how the benefits of RPA can be utilized in a business case study.	1	2	7
<b>OR</b>					
2.	a).	Outline the key components of an RPA system.	1	2	7
	b).	Compare RPA with traditional automation methods.	1	2	7
<b>UNIT-II</b>					
3.		Explain the different types of activities available in RPA tools like UiPath.	2	2	14
<b>OR</b>					
4.	a).	Develop an RPA workflow using different control flow statements to handle decision-making.	2	3	7
	b).	Develop a flowchart showing how the components of an RPA system interact.	2	3	7
<b>UNIT-III</b>					
5.	a).	Explain the concept of data scraping in RPA.	3	2	7
	b).	Explain how selectors are used to identify UI elements in RPA.	3	2	7
<b>OR</b>					
6.	a).	Compare image-based automation and keyboard-based automation in RPA.	3	2	7
	b).	Utilize anchors to automate data extraction from a PDF document.	3	3	7
<b>UNIT-IV</b>					
7.		Illustrate different types of triggers available in RPA for handling user events.	4	2	14

		<b>OR</b>			
<b>8.</b>	<b>a).</b>	Summarize common strategies for troubleshooting issues in RPA.	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain the workflow that incorporates exception handling mechanisms to manage errors effectively.	<b>4</b>	<b>2</b>	<b>7</b>
		<b>UNIT-V</b>			
<b>9.</b>		Describe how servers are used to manage and deploy bots in an RPA environment.	<b>5</b>	<b>2</b>	<b>14</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Describe the steps to publish a workflow in UiPath.	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Demonstrate a strategy for managing and deploying updates in an RPA project.	<b>5</b>	<b>3</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

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## IV B.Tech. I Semester MODEL QUESTION PAPER

## CLOUD COMPUTING

(Common to CSE, AIML and CSG)

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	List out & explain the different types of cloud computing service models	1	2	7
	b).	Explain Cloud essential characteristics	1	2	7
<b>OR</b>					
2.	a).	Describe cloud computing architecture	1	2	7
	b).	Explain cloud deployment models	1	2	7
<b>UNIT-II</b>					
3.	a).	Illustrate the relationship between virtualization and cloud computing	2	2	7
	b).	Interpret how to implement levels of virtualization	2	2	7
<b>OR</b>					
4.	a).	What is a hypervisor? Explain XEN hypervisor architecture.	2	2	7
	b).	Illustrate how virtualization used in Data-Center Automation.	2	2	7
<b>UNIT-III</b>					
5.	a).	Explain coordination of specialized autonomic performance managers	3	3	7
	b).	Determine the relationship between the scale of a system and the policies and the mechanisms for resource management. In your arguments, consider also the geographic scale of the system.	3	3	7
<b>OR</b>					
6.	a).	Interpret the concept of Resource Bundling	3	2	7
	b).	Determine the limitations and potential challenges of implementing the Start Time Fair Queuing algorithm at scale in a large cloud-computing environment. What strategies employed to mitigate these challenges?	3	3	7
<b>UNIT-IV</b>					
7.	a).	Summarize the storage models in cloud computing.	4	2	7
	b).	Explain the rationale behind secure cloud software requirements for a	4	2	7

		cloud-based application that handles sensitive customer data.			
		<b>OR</b>			
<b>8.</b>	<b>a).</b>	Explain the primary objectives of cloud information security, and why are they crucial in cloud computing?	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain Google file system with a diagram	<b>4</b>	<b>2</b>	<b>7</b>
		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	Illustrate Map-Reduce design in Hadoop	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain primary advantages of using Google App Engine for application deployment compared to traditional server provisional methods	<b>5</b>	<b>2</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Explain the concept of the four levels of federation in cloud computing	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Interpret the future of cloud federation	<b>5</b>	<b>2</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks



<b>Course Code: B20AM4102</b>					
<b>SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)</b>					<b>R20</b>
<b>IV B.Tech. I Semester MODEL QUESTION PAPER</b>					
<b>BIG DATA ANALYTICS</b>					
<b>For AIML</b>					
<b>Time: 3 Hrs.</b>			<b>Max. Marks: 70 M</b>		
Answer <b>ONE Question</b> from <b>EACH UNIT</b>					
All questions carry equal marks					
Assume suitable data if necessary					
			<b>CO</b>	<b>KL</b>	<b>M</b>
<b>UNIT-I</b>					
<b>1.</b>	<b>a).</b>	What is Big Data? List the Characteristic of Big Data.	<b>1</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain the Patterns for Big Data Development.	<b>1</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>2.</b>	<b>a).</b>	Differentiate Google File System and Hadoop Distributed File system.	<b>1</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	What are the major components of Big Data? Explain them in detail.	<b>1</b>	<b>2</b>	<b>7</b>
<b>UNIT-II</b>					
<b>3.</b>	<b>a).</b>	Discuss in detail about Hadoop Distributed File system (HDFS).	<b>2</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Mention the configuration of Hadoop cluster using standalone mode and Pseudo distributed mode in detail.	<b>2</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>4.</b>	<b>a).</b>	Explain Anatomy of a Map Reduce program.	<b>2</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain the order of execution of Mapper, Partitioner and Combiner in a MapReduce job with suitable example	<b>2</b>	<b>2</b>	<b>7</b>
<b>UNIT-III</b>					
<b>5.</b>	<b>a).</b>	What is Map Reduce? Write a map reduce program for weather data.	<b>3</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Identify the difference between Hadoop Old API vs New API.	<b>3</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>6.</b>	<b>a).</b>	Write about driver code in Hadoop Map Reduce.	<b>3</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	How does Bloom filter is used for data streaming?	<b>3</b>	<b>2</b>	<b>7</b>
<b>UNIT-IV</b>					
<b>7.</b>	<b>a).</b>	How to run Pig Latin scripts using Pig operators.	<b>4</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Demonstrate the Pig Architecture in detail.	<b>4</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>8.</b>	<b>a).</b>	List out different Data types and schemas in Pig.	<b>4</b>	<b>2</b>	<b>7</b>

	<b>b).</b>	Consider The student data File (st.txt). Data in the following format Name, District, age, gender. i) Write a PIG script to Display Names of all female students ii) Write a PIG script to find the number of Students form Prakasham District iii)Write a PIG script to Display District wise count of all male students.	<b>4</b>	<b>3</b>	<b>7</b>
<b>UNIT-V</b>					
<b>9.</b>	<b>a).</b>	Illustrate main features and Architecture of Hive with neat diagram	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain in brief about Data manipulation in Hive	<b>5</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>10.</b>	<b>a).</b>	Discuss DDL and DML commands in Hive	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Describe HBASE, Zookeeper, and the advantages of the Hadoop environment.	<b>5</b>	<b>2</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks





## IV B.Tech. I Semester MODEL QUESTION PAPER

## NoSQL DATABASES

(Common to AIML and CSG)

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Explain aggregates and the consequences of aggregate orientation	1	2	7
	b).	Explain impedance mismatch and how it is been handled	1	2	7
<b>OR</b>					
2.	a).	Write a brief note on aggregate oriented databases	1	2	7
	b).	Explain the emergence of NoSQL	1	2	7
<b>UNIT-II</b>					
3.	a).	Write a short note on types of Distributed models	2	2	7
	b).	What is consistency? Explain the various forms of consistency.	2	2	7
<b>OR</b>					
4.	a).	Write a short note on Replication methods	2	2	7
	b).	Explain CAP theorem with an example	2	2	7
<b>UNIT-III</b>					
5.	a).	Explain the features of Key-Value Store	3	2	7
	b).	Determine why shopping cart data uses key-value database as the best fit	3	3	7
<b>OR</b>					
6.	a).	Determine how key-value store is suitable for storing session information	3	3	7
	b).	Explain when not to use Key-Value stores	3	2	7
<b>UNIT-IV</b>					
7.	a).	Explain the features of document databases	4	2	7
	b).	Explain suitable uses cases for column-family data stores	4	2	7
<b>OR</b>					
8.	a).	Explain suitable uses cases for document databases	4	2	7

	<b>b).</b>	Explain the features of column-family data store	<b>4</b>	<b>2</b>	<b>7</b>
		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	Explain the features of graph databases	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain schema changes in RDBMS	<b>5</b>	<b>2</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Briefly explain the use cases of graph databases	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain schema changes in a NoSQL database	<b>5</b>	<b>2</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

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## IV B.Tech. I Semester MODEL QUESTION PAPER

## NATURAL LANGUAGE PROCESSING WITH DEEP LEARNING APPLICATIONS

## For AIML

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
		<b>UNIT-I</b>			
1.	a).	Compute Regular Expression for the following: <ul style="list-style-type: none"> <li>• To accept strings book or books</li> <li>• To accept colour and color.</li> <li>• To accept any +ve integer with an optional decimal point</li> <li>• To check a string is an email address or not.</li> </ul>	1	3	7
	b).	Explain about words, corpora and sentence segmentation.	1	2	7
		<b>OR</b>			
2.	a).	Explain the process of Word Normalization in NLP	1	2	7
	b).	Apply Minimum edit distance algorithm and compute the minimum edit distance between tutor and tumour.	1	3	7
		<b>UNIT-II</b>			
3.	a).	Consider the following Corpus of three sentences <ul style="list-style-type: none"> <li>• There is a big garden.</li> <li>• Children play in a garden</li> <li>• They play inside beautiful garden</li> </ul> Calculate P for the sentence "They play in a big Garden" assuming a bi-gram language model.	2	3	7
	b).	Given the sentence: "She enjoys painting landscapes on weekends." Use Python and the NLTK library to tag the words with their parts of speech. Identify and count the verbs and nouns in the sentence.	3	3	7
		<b>OR</b>			
4.	a).	Compute Perplexity to evaluate language model by considering an example.	2	3	7
	b).	Given this text: "Amazon is launching a new product in New York next month." Use Python and the spaCy library to identify the named entities (like company names, places, dates). List each entity and its category (e.g., organization, location, date).	3	3	7

<b>UNIT-III</b>					
<b>5.</b>	<b>a).</b>	Describe word sense and identify the relations between senses	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Describe one way in which WordNet helps in understanding word meanings?	<b>4</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>6.</b>		Describe contextual embeddings and How do they help in Word Sense Disambiguation (WSD) by considering the context in which a word is used?	<b>4</b>	<b>2</b>	<b>14</b>
<b>UNIT-IV</b>					
<b>7.</b>	<b>a).</b>	Explain how the self-attention mechanism in a Transformer model helps to focus on different parts of the sentence with an example where self-attention can identify the relationship between words.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Use multihead attention mechanism to enhance the model's ability to understand complex language patterns?	<b>5</b>	<b>3</b>	<b>7</b>
<b>OR</b>					
<b>8.</b>	<b>a).</b>	Describe the components of a Transformer block, including the role of the residual stream. Create a simple diagram to show how the input data flows through these components.	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain how token embeddings and position embeddings are used as inputs in a Transformer model. Give an example of how these embeddings help the model understand the order and meaning of words in a sentence.	<b>5</b>	<b>2</b>	<b>7</b>
<b>UNIT-V</b>					
<b>9.</b>	<b>a).</b>	Illustrate encoder-decoder architecture and its functionality in translation tasks.	<b>6</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Use typological knowledge to evaluate translation system design choices.	<b>6</b>	<b>3</b>	<b>7</b>
<b>OR</b>					
<b>10.</b>	<b>a).</b>	Explain the concepts of dense vectors to analyze improvements in retrieval accuracy.	<b>6</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Demonstrate the importance of semantic matching in improving retrieval relevance.	<b>6</b>	<b>3</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

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## IV B.Tech. I Semester MODEL QUESTION PAPER

## REINFORCEMENT LEARNING

Common to AIML, CSG

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Explain Limitations and Scope of Reinforcement Learning	1	2	7
	b).	Solve An Extended Example of Tic-Tac-Toe Problem	1	3	7
<b>OR</b>					
2.	a).	Explain the role of incremental updates in action-value methods for a k-armed bandit problem.	1	2	7
	b).	Apply optimistic initial values and UCB action selection in the 10-armed testbed and analyze their impact on exploration and exploitation.	1	3	7
<b>UNIT-II</b>					
3.	a).	Explain Agent-Environment Interface	2	2	7
	b).	Apply the concept of optimal policies to design a strategy for an agent in a continuing task within a Finite Markov Decision Process and evaluate its effectiveness.	2	3	7
<b>OR</b>					
4.	a).	Explain the process of policy evaluation and policy iteration in dynamic programming.	2	2	7
	b).	Implement value iteration for a given Markov Decision Process and analyze the efficiency of asynchronous dynamic programming	2	3	7
<b>UNIT-III</b>					
5.	a).	Explain the difference between Monte Carlo prediction and Monte Carlo estimation of action values.	3	2	7
	b).	Apply off-policy Monte Carlo control to optimize the policy of an agent and evaluate its performance compared to on-policy methods	3	3	7
<b>OR</b>					
6.	a).	What are the advantages of Temporal Difference (TD) prediction methods compared to Monte Carlo methods in reinforcement learning?	3	2	7
	b).	Apply Expected Sarsa to mitigate maximization bias in reinforcement learning algorithms and assess its impact on learning stability and	3	3	7

		efficiency.			
		<b>UNIT-IV</b>			
<b>7.</b>	<b>a).</b>	Illustrate why the Bellman Error is not Learnable	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Apply the n-step Tree Backup algorithm to optimize the control of an agent in a complex decision-making scenario	<b>4</b>	<b>3</b>	<b>7</b>
		<b>OR</b>			
<b>8.</b>	<b>a).</b>	Compare and contrast the saras( $\lambda$ ), Watkin's Q( $\lambda$ )	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Apply TD( $\lambda$ ) to optimize an agent's policy in a complex decision-making scenario, examining the influence of $\lambda$ values on learning speed and policy stability	<b>4</b>	<b>3</b>	<b>7</b>
		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	Illustrate The Policy Gradient Theorem.	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Describe a personalized recommendation system using reinforcement learning and evaluate its performance compared to traditional methods.	<b>5</b>	<b>2</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Discuss TD-Gammon and its Applications	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain Actor-Critic Methods, Policy Gradient for Continuing Problem	<b>5</b>	<b>2</b>	<b>7</b>

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

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Estd. 1980

ENGINEERING COLLEGE  
AUTONOMOUS

## IV B.Tech. I Semester MODEL QUESTION PAPER

## SOFT COMPUTING

## For AIML

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Describe the characteristics of Soft computing models	1	2	7
	b).	Compare the Mamdani and Sugeno models of fuzzy inference	1	2	7
<b>OR</b>					
2.	a).	Explain the terms: membership function, fuzzy singleton, support in the context of Fuzzy sets and how do fuzzy sets generalize the idea to classical sets.	1	2	7
	b).	Explain extension principle and fuzzy relations with suitable examples	1	3	7
<b>UNIT-II</b>					
3.	a).	Compare gradient based and gradient free optimization	2	2	7
	b).	Illustrate the application of classical Newton method to simple quadratic problem	2	2	7
<b>OR</b>					
4.	a).	Explain the classical Newton's method and Quasi Newton method for optimization	2	2	7
	b).	Describe the characteristics of derivative free optimization methods	2	2	7
<b>UNIT-III</b>					
5.	a).	Explain how different knowledge representation methods influence the reasoning process in AI systems	3	2	7
	b).	Apply predicate calculus to reason about whether "Penguins can fly" using the following set of premises "All birds can fly" and "Penguins are birds".	3	3	7
<b>OR</b>					
6.	a).	Apply heuristic search technique for travelling salesman problem	3	3	7
	b).	Use symbolic reasoning to solve sudoku problem	3	3	7
<b>UNIT-IV</b>					

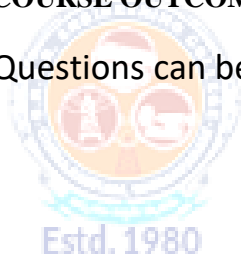
7.	a).	Illustrate Adaptive Neuro Fuzzy Inference System Architecture	4	2	7
	b).	Interpret how the combination of gradient descent and least squares estimation facilitate the training process in ANFIS.	4	2	7
		<b>OR</b>			
8.	a).	Describe about the learning methods that cross-fertilize ANFIS and RBFN	4	2	7
	b).	Illustrate the different neuron functions that are used in adaptive networks	4	2	7
		<b>UNIT-V</b>			
9.	a).	Summarize the different soft computing approaches to solve color recipe prediction problem	5	2	7
	b).	Solve printed character recognition problem using fuzzy inference system	5	3	7
		<b>OR</b>			
10.	a).	Solve automobile fuel efficiency prediction using appropriate computational intelligence technique.	5	3	7
	b).	Explain how Inverse Kinematics Problem can be solved using ANFIS.	5	2	7

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks





## IV B.Tech. I Semester MODEL QUESTION PAPER

## CRYPTOGRAPHY AND NETWORK SECURITY

## For AIML

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Differentiate Active attacks and Passive attacks.	1	2	7
	b).	Explain Traditional Block cipher Structure.	1	2	7
<b>OR</b>					
2.	a).	Describe a monoalphabetic cipher and demonstrate it with an example.	1	2	7
	b).	Explain Block cipher design principles.	1	2	7
<b>UNIT-II</b>					
3.	a).	Perform Encryption and Decryption using RSA algorithm for $p=17$ , $q=11$ , $e=7$ , $M=88$ .	2	3	7
	b).	Demonstrate the structure of the DES algorithm using a detailed diagram, and describe the steps involved in each round of DES encryption.	2	3	7
<b>OR</b>					
4.	a).	Determine Block Cipher modes of operations.	2	3	7
	b).	Find the secret key shared between User A and User B using Diffie Hellman Key exchange algorithm for the following: $q=97$ , $a=5$ , the private keys $X_A = 36$ , $X_B = 58$ .	2	3	7
<b>UNIT-III</b>					
5.	a).	Illustrate digital signature algorithm with neat diagram and explain how to sign and verify using DSS algorithm	3	2	7
	b).	Differentiate between HMAC and CMAC	3	2	7
<b>OR</b>					
6.	a).	Explain various steps of SHA in detail with neat diagram.	3	2	7
	b).	Explain ISAKMP Protocol with neat diagram.	3	2	7
<b>UNIT-IV</b>					
7.	a).	Describe Kerberos with steps to grant the ticket.	4	2	7

	<b>b).</b>	Summarize the services provided by PGP with neat diagram.	<b>4</b>	<b>2</b>	<b>7</b>
		<b>OR</b>			
<b>8.</b>	<b>a).</b>	Describe in detail about SSL/TLS.	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain Web security requirements.	<b>4</b>	<b>2</b>	<b>7</b>
		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	Describe IP sec architecture with neat diagram	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain about different types of firewalls.	<b>5</b>	<b>2</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Explain in detail about the Authentication header with neat diagram.	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Compare various types of firewalls.	<b>5</b>	<b>2</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks



<b>Course Code: B20AM4108</b>					
<b>SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)</b>					<b>R20</b>
<b>IV B.Tech. I Semester MODEL QUESTION PAPER</b>					
<b>BLOCK CHAIN TECHNOLOGIES</b>					
<b>Common to AIML, CSG</b>					
<b>Time: 3 Hrs.</b>			<b>Max. Marks:70</b>		
<b>Answer any one Question from Each Unit</b>					
<b>All questions carry equal Marks</b>					
			<b>CO</b>	<b>KL</b>	<b>M</b>
<b>UNIT-I</b>					
<b>1</b>	<b>a).</b>	Explain the benefits and limitations of blockchain technology.	<b>1</b>	<b>2</b>	<b>6</b>
	<b>b).</b>	Describe the various stages in Block chain evolution.	<b>1</b>	<b>2</b>	<b>8</b>
<b>2</b>	<b>a).</b>	Explain the type of players in the in Block Chain Ecosystem	<b>1</b>	<b>2</b>	<b>8</b>
	<b>b).</b>	Compare centralized applications with Decentralized applications.	<b>1</b>	<b>2</b>	<b>6</b>
<b>UNIT-II</b>					
<b>3</b>	<b>a).</b>	Explain the Merkle-tree structure in Block chain.	<b>2</b>	<b>2</b>	<b>6</b>
	<b>b).</b>	Explain the Consensus algorithm in detail	<b>2</b>	<b>2</b>	<b>8</b>
<b>OR</b>					
<b>4</b>	<b>a).</b>	Discuss about the types of Block chain nodes and the risks associated with block chain solutions.	<b>2</b>	<b>2</b>	<b>6</b>
	<b>b).</b>	Explain in detail the Life cycle of block chain transaction,	<b>2</b>	<b>2</b>	<b>8</b>
<b>UNIT-III</b>					
<b>5</b>	<b>a).</b>	Illustrate the Block chain Relevance Evaluation Framework.	<b>3</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Describe the various types of Types of Block chain Applications	<b>3</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>6</b>	<b>a).</b>	Determine the Architecture with Block chain Platforms.	<b>3</b>	<b>3</b>	<b>8</b>
	<b>b).</b>	Explain the approach for designing Blockchain applications.	<b>3</b>	<b>2</b>	<b>6</b>
<b>UNIT-IV</b>					
<b>7</b>	<b>a).</b>	Explain the Ethereum Blockchain implementation.	<b>4</b>	<b>2</b>	<b>8</b>
	<b>b).</b>	Explain the Truffle framework and Ganache in Blockchain.	<b>4</b>	<b>2</b>	<b>6</b>
<b>OR</b>					
<b>8</b>	<b>a).</b>	Describe smart contract programming.	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain Tuna Fish Tracking Use Case with the help of Block chain Implementation.	<b>4</b>	<b>2</b>	<b>7</b>

<b>UNIT-V</b>					
<b>9</b>	<b>a).</b>	Explain the Hyper ledger Fabric Transaction Flow in detail.	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Compare Hyper ledger with Ethereum	<b>5</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>10</b>		Explain the Block chain implementation for Hyperledger	<b>5</b>	<b>2</b>	<b>14</b>
<b>CO-COURSE OUTCOME</b>		<b>KL-KNOWLEDGE LEVEL</b>	<b>M-MARKS</b>		

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## SPEECH PROCESSING

## For AIML

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Describe Anatomy & Physiology of Speech Organs	1	2	7
	b).	Demonstrate effect of losses in vocal tract	1	2	7
<b>OR</b>					
2.	a).	Illustrate The process of Speech Production	1	2	7
	b).	Demonstrate effect of radiation at lips	1	2	7
<b>UNIT-II</b>					
3.	a).	Compare Short time energy and average magnitude Short time average zero crossing rate	2	2	7
	b).	Explain about Pitch period estimation using a parallel processing approach	2	3	7
<b>OR</b>					
4.	a).	Compare Speech and Silence discrimination using energy and zero crossing	2	2	7
	b).	Explain about Pitch period estimation using the autocorrelation function	2	3	7
<b>UNIT-III</b>					
5.	a).	Explain about The Autocorrelation Method	3	3	7
	b).	Compare between the Methods of Solution of the LPC Analysis Equations	3	2	7
<b>OR</b>					
6.	a).	Explain about The Covariance Method	3	3	7
	b).	Demonstrate Formant Analysis using LPC Parameters	3	2	7
<b>UNIT-IV</b>					
7.	a).	Explain Properties of the Complex Cepstrum,	4	2	7
	b).	Demonstrate Pitch Detection	4	2	7
<b>OR</b>					

<b>8.</b>	<b>a).</b>	Explain Speech enhancement techniques	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Compare Comb filter, Wiener filter	<b>4</b>	<b>2</b>	<b>7</b>
		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	Demonstrate the similarity of speech patterns	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Demonstrate Parametric representation of speech	<b>5</b>	<b>3</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Demonstrate Hidden Markov Model (HMM) for speech recognition	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Demonstrate Speaker Verification System	<b>5</b>	<b>3</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## SOCIAL NETWORK ANALYSIS

## Common to AIML, CSG

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Demonstrate Three Levels of Social Network Analysis	1	3	7
	b).	Describe Graph Visualization Tools	1	2	7
<b>OR</b>					
2.	a).	Demonstrate Node Centrality	1	3	7
	b).	Compare Transitivity and Reciprocity	1	2	7
<b>UNIT-II</b>					
3.	a).	Demonstrate Random network model	2	3	7
	b).	Compare Page Rank and Personalized Page Rank	2	2	7
<b>OR</b>					
4.	a).	Demonstrate Watts-Strogatz Model	2	3	7
	b).	Compare SimRank and PathSim	2	2	7
<b>UNIT-III</b>					
5.	a).	Explain Disjoint Community Detection	3	2	7
	b).	Identify Heuristic Models	3	2	7
<b>OR</b>					
6.	a).	Explain Overlapping Community Detection	3	2	7
	b).	Identify Probabilistic Models	3	2	7
<b>UNIT-IV</b>					
7.	a).	Demonstrate Epidemic Models	4	3	7
	b).	Describe Anomaly Detection in Static Networks	4	2	7
<b>OR</b>					
8.	a).	Demonstrate Challenges in Anomaly Detection in Static Networks	4	3	7
	b).	Describe Independent Cascade Models	4	2	7

<b>UNIT-V</b>					
<b>9.</b>	<b>a).</b>	Explain Machine Learning Pipelines	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Demonstrate Malicious Activities on OSNs	<b>5</b>	<b>3</b>	<b>7</b>
<b>OR</b>					
<b>10.</b>	<b>a).</b>	Explain GRL Pipelines	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Demonstrate Modeling the Spread of COVID-19	<b>5</b>	<b>3</b>	<b>7</b>
<b>CO-COURSE OUTCOME</b>		<b>KL-KNOWLEDGE LEVEL</b>	<b>M-MARKS</b>		

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks





## IV B. Tech. I Semester MODEL QUESTION PAPER

## RECOMMENDER SYSTEMS

## Common to AIML, CSG

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M																																																				
<b>UNIT-I</b>																																																									
1.	a).	Explain the primary goals of a recommender system. How do these goals contribute to enhancing user experience in online platforms?	1	2	8																																																				
	b).	Describe any four real world applications of recommender systems	1	2	6																																																				
<b>OR</b>																																																									
2.	a).	Describe the basic models of recommender systems.	1	2	7																																																				
	b).	Illustrate three domain-specific challenges faced by recommender systems.	1	2	7																																																				
<b>UNIT-II</b>																																																									
3.	a).	<p>Consider the following ratings table between five users and six items</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2"></th> <th colspan="6">Item Id</th> </tr> <tr> <th colspan="2"></th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> </tr> </thead> <tbody> <tr> <th rowspan="5">User Id</th> <th>1</th> <td>5</td> <td>6</td> <td>7</td> <td>4</td> <td>3</td> <td>?</td> </tr> <tr> <th>2</th> <td>4</td> <td>?</td> <td>3</td> <td>?</td> <td>5</td> <td>4</td> </tr> <tr> <th>3</th> <td>?</td> <td>3</td> <td>4</td> <td>1</td> <td>1</td> <td>?</td> </tr> <tr> <th>4</th> <td>7</td> <td>4</td> <td>3</td> <td>6</td> <td>?</td> <td>4</td> </tr> <tr> <th>5</th> <td>1</td> <td>?</td> <td>3</td> <td>2</td> <td>2</td> <td>5</td> </tr> </tbody> </table> <p>a) Compute the values of unspecified ratings of user 2 using user-based collaborative filtering algorithms. Use the Pearson correlation with mean-centering. Assume a peer group of size 2.</p>			Item Id								1	2	3	4	5	6	User Id	1	5	6	7	4	3	?	2	4	?	3	?	5	4	3	?	3	4	1	1	?	4	7	4	3	6	?	4	5	1	?	3	2	2	5	2	3	7
		Item Id																																																							
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User Id	1	5	6	7	4	3	?																																																		
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	4	7	4	3	6	?	4																																																		
	5	1	?	3	2	2	5																																																		
	b).	Given a high-dimensional user-item matrix, describe the steps you would take to apply SVD for reducing dimensionality and improving the performance of a neighborhood-based recommender system.	2	2	7																																																				
<b>OR</b>																																																									
4.	a).	Demonstrate the first three iterations of personalized page rank computation to find the most similar users to target user 'u1' in the	2	3	7																																																				

		following rating matrix																																						
		<table border="1"> <thead> <tr> <th></th> <th>I1</th> <th>I2</th> <th>I3</th> <th>I4</th> </tr> </thead> <tbody> <tr> <th>U1</th> <td>1</td> <td></td> <td></td> <td>5</td> </tr> <tr> <th>U2</th> <td></td> <td>5</td> <td></td> <td></td> </tr> <tr> <th>U3</th> <td>5</td> <td>3</td> <td></td> <td>1</td> </tr> <tr> <th>U4</th> <td></td> <td></td> <td>3</td> <td></td> </tr> <tr> <th>U5</th> <td></td> <td></td> <td></td> <td>3</td> </tr> <tr> <th>U6</th> <td>5</td> <td></td> <td>4</td> <td></td> </tr> </tbody> </table>		I1	I2	I3	I4	U1	1			5	U2		5			U3	5	3		1	U4			3		U5				3	U6	5		4				
	I1	I2	I3	I4																																				
U1	1			5																																				
U2		5																																						
U3	5	3		1																																				
U4			3																																					
U5				3																																				
U6	5		4																																					
	b).	Explain the role of horting and predictability in predicting missing ratings in graph-based models for neighborhood-based methods	2	2	7																																			
		<b>UNIT-III</b>																																						
5.	a).	Demonstrate how Naïve Bayes Model can be used for Collaborative filtering with the help of an example	3	3	7																																			
	b).	Explain the process involved for using Decision and Regression trees for collaborative filtering	3	2	7																																			
		<b>OR</b>																																						
6.	a).	Demonstrate Non-negative matrix factorization with the help of an example	3	3	7																																			
	b).	Compare Neighborhood based collaborative filtering approach with Model based collaborative filtering approach.	3	2	7																																			
		<b>UNIT-IV</b>																																						
7.	a).	Illustrate constraint-based recommender systems	4	2	7																																			
	b).	Compare content based and collaborative filtering approaches for building recommender systems	4	2	7																																			
		<b>OR</b>																																						
8.	a).	Describe the basic components of a content-based recommender system.	4	2	6																																			
	b).	Summarize the methods used for feature representation, feature cleaning and feature selection in Content Based Recommender Systems	4	2	8																																			
		<b>UNIT-V</b>																																						
9.	a).	Explain the different Recommender Systems evaluation paradigms	5	2	7																																			
	b).	Summarize the general goals in evaluating the recommender systems.	5	2	7																																			
		<b>OR</b>																																						
10.	a).	Describe the metrics used for offline evaluation of recommender systems	5	2	7																																			
	b).	Explain the evaluation metrics that can be used in the case of implicit and explicit feedbacks	5	2	7																																			

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks

## IV B. Tech. I Semester MODEL QUESTION PAPER

## AI CHATBOTS

## Common to AIML, CSG

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Classify the elements of a customer-centric approach in financial services.	1	2	7
	b).	Illustrate the benefits of chatbots for a business.	1	2	7
<b>OR</b>					
2.	a).	Describe case study to show the role of chatbots in the insurance industry.	1	2	7
	b).	Explain potential challenges companies might face in ensuring customer rights under the General Data Protection Regulation (GDPR).	1	2	7
<b>UNIT-II</b>					
3.	a).	Apply chatbot-related terms to describe the main functions and roles in industries.	2	3	7
	b).	Select an AI-based approach and a Rule-based approach to solve a specific problem and compare their outcomes.	2	3	7
<b>OR</b>					
4.	a).	Construct a real-world use case for chatbots, illustrating their application in a specific industry.	2	3	7
	b).	Identify the characteristics of customer service-centric chatbots and illustrate their benefits in improving customer support.	2	3	7
<b>UNIT-III</b>					
5.	a).	Compare the functionalities and user experiences of chatbots versus traditional apps.	3	2	7
	b).	Explain the generic solution architecture for a private chatbot.	2	2	7
<b>OR</b>					
6.	a).	Summarize the key success metrics used to evaluate chatbots.	2	2	7
	b).	Outline the benefits of chatbots in business operations.	3	2	7

<b>UNIT-IV</b>					
<b>7.</b>	<b>a).</b>	Explain the architecture of chatbots.	<b>4</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Compare NLP, NLU and NLG in the context of chatbot technology.	<b>4</b>	<b>2</b>	<b>7</b>
<b>OR</b>					
<b>8.</b>		Describe open-source NLP and NLU Tools for a real-world scenario.	<b>4</b>	<b>2</b>	<b>14</b>
<b>UNIT-V</b>					
<b>9.</b>	<b>a).</b>	Choose the best tool among RASA, Microsoft Bot, and Google Dialog Flow for any use case and justify your choice.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Develop a simple QnA bot using QnA Maker and demonstrate its functionality.	<b>5</b>	<b>3</b>	<b>7</b>
<b>OR</b>					
<b>10.</b>	<b>a).</b>	Illustrate LUCIS intent classification.	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Illustrate the working of the RASA framework by building a simple chatbot and demonstrating its features.	<b>5</b>	<b>2</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## OBJECT ORIENTED ANALYSIS AND DESIGN

## For AIML

Time: 3 Hrs.

Max. Marks: 70 M

Answer **ONE Question** from **EACH UNIT**

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Explain the attributes of complex system	1	2	7
	b).	Explain the importance of model building	1	2	7
<b>OR</b>					
2.	a).	Explain Algorithmic verses Object Oriented Decomposition	1	2	7
	b).	Explain the elements of Software Design Methodologies	1	2	7
<b>UNIT-II</b>					
3.	a).	Explain principles of modeling.	2	2	7
	b).	Explain common techniques for modeling classes and relationships	2	2	7
<b>OR</b>					
4.	a).	Explain common mechanisms in UML	2	2	7
	b).	Explain Software Development Life Cycle	2	2	7
<b>UNIT-III</b>					
5.	a).	Explain modeling simple collaborations with an example	3	3	7
	b).	Explain modeling static types and dynamic types	3	2	7
<b>OR</b>					
6.	a).	Explain the special properties of attributes and operations	3	2	7
	b).	Compare composition and aggregation relationships	3	3	7
<b>UNIT-IV</b>					
7.	a).	Explain modeling flows of control by time ordering with an example	4	3	7
	b).	Explain modeling a workflow with suitable swimlane diagram	4	3	7
<b>OR</b>					
8.	a).	Explain modeling the context of a system with an example use case diagram	4	3	7
	b).	Explain modeling an operation with an example activity diagram	4	3	7

<b>UNIT-V</b>					
<b>9.</b>	<b>a).</b>	Explain the kinds of events	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain modeling the distribution of component with an example	<b>5</b>	<b>3</b>	<b>7</b>
<b>OR</b>					
<b>10.</b>	<b>a).</b>	Explain modeling the lifetime of an object with an example	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain communication and synchronization when objects collaborate	<b>5</b>	<b>2</b>	<b>7</b>
<b>CO-COURSE OUTCOME</b>			<b>KL-KNOWLEDGE LEVEL</b>		<b>M-MARKS</b>

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## VIDEO ANALYTICS

## For AIML

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.		Explain the need for video analytics in modern applications. How do video analytics differ from traditional image processing techniques?	1	2	14
<b>OR</b>					
2.	a).	Describe edge detection in a video analytics system?	1	2	7
	b).	Explain the role of smoothing in preprocessing video data	1	2	7
<b>UNIT-II</b>					
3.	a).	Apply a Gaussian Mixture Model for background estimation in a video surveillance system?	2	3	7
	b).	Use morphological operations in the context of image processing?	2	3	7
<b>OR</b>					
4.	a).	Use optical flow-based methods for foreground extraction?	2	3	7
	b).	Demonstrate the advantages of using morphological operations like erosion and dilation in image segmentation?	2	3	7
<b>UNIT-III</b>					
5.	a).	Explain the type of problems that can be solved using a Bayesian classifier, and why?	3	2	6
	b).	Apply Bayesian classifier to enhance the detection of foreground objects in noisy video data	3	3	8
<b>OR</b>					
6.	a).	Compare fuzzy classifiers with HMM-based classifiers.	3	2	6
	b).	Apply neural networks with backpropagation to improve the accuracy of foreground extraction in video analytics?	3	3	8
<b>UNIT-IV</b>					
7.	a).	Outline the process and challenges involved in abandoned object detection using video analytics.	4	2	6

	<b>b).</b>	Apply video analytics to conduct crowd analysis and predict crowd congestion during a large public event.	<b>4</b>	<b>3</b>	<b>8</b>
		<b>OR</b>			
<b>8.</b>	<b>a).</b>	Describe how does human behavioral analysis contribute to enhancing security measures in video surveillance systems?	<b>4</b>	<b>2</b>	<b>6</b>
	<b>b).</b>	Find video analytics solution for perimeter security in a high-security facility?	<b>4</b>	<b>3</b>	<b>8</b>
		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	Explain the process of people counting in a retail environment. How does accurate people count benefit business operations and customer service?	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Find a scenario where video analytics can be used to detect traffic rule violations.	<b>5</b>	<b>3</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Explain different techniques for identifying and managing traffic congestion	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Use video analytics to develop a lane change warning system for driver assistance in modern vehicles?	<b>5</b>	<b>3</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 14 marks

Estd. 1980

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