Reg. No.																

Question Paper Code	13893

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Seventh Semester

Information Technology

20AIOE908 - COGNITIVE SCIENCE AND ANALYTICS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	What distinguishes cognitive computing from narrow traditional AI? (a) Requires fewer computational resources (b) Focuses on automation of repetitive tasks (c) Learns from interactions and adapts dynamically (d) Only handles structured data	1	K1	CO1
2.	In cognitive systems, perception refers to: (a) Data encryption (b) Understanding and interpreting sensory data (c) Sorting of files (d) CPU performance	1	K2	CO1
3.	In _____ the whole corpusis divided into sentences. (a) Tokenization (b) removing stop words, special characters and numbers (c) sentence segmentation (d) converting text into a common case	1	K2	CO2
4.	What is natural language processing (NLP) used for in cognitive systems? (a) Data compression (b) Programming applications (c) Understanding and generating human language (d) Sorting large datasets	1	K1	CO2
5.	A trader who wants to predict short-term movements in stock prices is likely to use _____analytics. (a) predictive (b) descriptive (c) normative (d) prescriptive	1	K1	CO3
6.	Which of Big Data emphasizes the importance of data quality and accuracy? (a) Volume (b) Variety (c) Velocity (d) Veracity	1	K1	CO3
7.	Which disruptive model focuses on learning word representations based on the entire context of a sentence, rather than in a sequential manner? (a) Decoder-only models (e.g., GPT) (b) Encoder-only models (e.g., BERT) (c) Traditional expert systems (d) Rule-based models	1	K2	CO4
8.	Which cognitive computing platform from IBM is designed to assist and enhance human decision-making processes in various industries? (a) Oracle Adaptive Intelligent Apps (b) Sales force Einstein (c) SAP Leonardo (d) IBM Watson Discovery	1	K1	CO4
9.	What is the primary function of YARN (Yet Another Resource Negotiator)? (a) Storage of huge datasets (b) Batch processing of large datasets (c) Managing compute resources and scheduling jobs (d) Processing real-time data streams	1	K2	CO5
10.	One of the core strengths of IBM Watson is: (a) Ability to process unstructured data like text and images (b) Replacing human workers entirely (c) Building hardware chips (d) Running simple calculations faster than other systems	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Define the term Corpus and Ontology.	2	K1	CO1
12.	How Reinforcement learning used in cognitive computing.	2	K2	CO1
13.	Differentiate between stemming and lemmatization.	2	K2	CO2
14.	What is the use of Natural Language Processing Toolkit (NLPTK)?	2	K1	CO2
15.	What is meant by Singular Value Decomposition (SVD)?	2	K1	CO3
16.	Compare labeled data and Un Labeled data with suitable examples.	2	K2	CO3
17.	Show the comparison of the characteristics of SQL and NoSQL databases.	2	K2	CO4
18.	Write short notes on Skip-Bigram.	2	K1	CO4
19.	Outline the challenges and complexity of the Jeopardy.	2	K2	CO5
20.	How Anticipatory analytics used in cognitive systems.	2	K2	CO5
21.	What is meant by Self Organizing Map (SOM)?	2	K1	CO6
22.	State the algorithmic components that make IBM Watson a cognitive system.	2	K2	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	How does Kahneman's dual process theory transform the design of cognitive computing architectures to emulate human intuition and deliberation?	11	K2	CO1
		OR			
	b) (i)	Illustrate the core elements of a cognitive system and explain how they integrate perception to emulate human-like cognition inartificial agents.	6	K2	CO1
	(ii)	Discuss how to incorporate data into the Cognitive System in order to buildacorpus.	5	K2	CO1
24.	a)	Explain the Discourse analysis and techniques for resolving structural ambiguity in NLP.	11	K2	CO2
		OR			
	b)	Illustrate the evolution of Markov chain–based language models through Hidden Markov Models (HMMs). In what ways has this evolution shaped modern cognitive computing and NLP architectures?	11	K2	CO2
25.	a)	Demonstrate with a neat Architecture diagram how Hadoop MapReduce performs its tasks of data movement.	11	K2	CO3
		OR			
	b) (i)	Outline the tools used by Unsupervised learning algorithms to analyze data.	6	K2	CO3
	(ii)	"The Industrial evolution is the result of using machine learning and analytics to optimize business results". Explain the given statement in detail with suitable examples.	5	K2	CO3
26.	a)	Apply the IBM Watson's Deep QA architecture in a real world scenario and explain how Watson is different from other search engines.	11	K3	CO4
		OR			
	b)	Identify the major four key elements of the questions that need to be detected for a successful Question Analysis using English Slot Grammar.	11	K3	CO4
27.	a)	Build the constituents used for a Healthcare Ecosystem. Illustrate the characteristics of a knowledge management in healthcare systems.	11	K3	CO5
		OR			
	b)	Develop a cognitive system for a smart city. Plan the measures to automate the governance. How does it differ from precognitive solutions?	11	K3	CO5

28.	a)	Extend the various applications of Vertical Markets andIndustries for Cognitive Computing.	*11*	*K2*	*CO6*
		OR			
	b) (i)	Show how a Cognitive Application helps to Improve Clinical Teaching.	*6*	*K2*	*CO6*
	(ii)	Demonstrate the different smarter approaches to preventive healthcare for improving Public Health.	*5*	*K2*	*CO6*