RA2211026030005
CSE-AI/ML-A

SRM Institute of Science and Technology
Department of CSE/ ECE/ AE
Delhi – Meerut Road, Sikri Kalan, Ghaziabad, Uttar Pradesh – 201204

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
DELHI-NCR CAMPUS, GHAZIABAD (U.P)

Academic Year: 2024-25 (EVEN)

Test : Internal Examination I
Course Code &Title : 21CSS303T DATA SCIENCE
Year & Sem : III / VI

Date& Session : 03/02/2025 FN
Duration: 1 Hour
Max. Marks: 30

Part - A

Answer all questions **(10Q x 1M = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Data Preparation phase includes: A) Data Cleaning, Integration, Transformation B) Data Cleaning, Exploration, Transformation C) Data Normalization, Integration, Transformation D) Data Cleaning, Integration, Presentation	1	L1	1	5
2	How does the np.vstack function differ from the np.hstack function? A) np.vstack stacks arrays vertically (row-wise), while np.hstack stacks arrays horizontally (column-wise) B) np.vstack stacks arrays horizontally, while np.hstack stacks arrays vertically C) np.vstack performs element-wise multiplication, while np.hstack performs element-wise addition D) np.vstack and np.hstack are used for reshaping arrays	1	L1	1	5
3	The eye function in numpy returns A) Null Matrix B) An Identity Matrix C) A Diagonal Matrix D) A Symmetric Matrix with only 1s and 0s	1	L1	1	5
4	How do you flatten a NumPy array into a 1D array? A) Using np.flatten(-1) B) Using np.ravel(-1) C) Using np.reshape(-1) D) Using np.expand_dims(-1)	1	L1	1	5
5	Which of the following is not an application for data science? A) Image & speech recognition B) Online price comparison C) Privacy checker D) Recommendation systems	1	L1	1	5
6	For the array: A = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]]) What is the output of the A [1: :2] is? A) [[4, 5], [7, 8]] B) [[5, 6], [8, 9]] C) [[1, 2], [4, 5]] D) [[2, 3], [5, 6]]	1	L3	1	5
7	The syntax to create shallow copy in numpy array: A) arr.view() B) arr.copy() C) arr.shallow() D) arr.deep()	1	L2	1	5

8	Default data type of matrix created by numpy.identity is . A) int. B) float C) complex D) Boolean	1	L1	1	5
9	Which function is used to find the indices where a condition is met in a NumPy array? A) np.sort() B) np.extract() C) np.where() D) np.index()	1	L1	1	5
10	How do you create a numpy array from a python list? A) np.array(list) B) numpy(list) C) array(list) D) create.array(list)	1	L1	1	5

Part B

Answer any three questions — **3Q x 4M=12 Marks**

11	Write a program in python to create two-dimensional array and perform the following operations: a) Display the dimensions b) Print rows and columns c) Print the total number of elements in an array d) Print the data type of element in an array	4	L3	1	5
12	Summarize the different ways of copying an array with an example.	4	L2	1	5
13	Distinguish between numpy identity function and eye function with an example.	4	L4	1	5
14	Use Python Slicing operator to show the output for the following of a given list: A= [1,2,3,4,5] a) Get all the items before a specific position. b) Get all the items from one position to another position. c) Get all the items d) Get all the items after a specific position	4	L3	1	5

Part C

Answer all questions — **1Q x 8M= 8 Marks**

15.	(A) Consider two arrays: A = [1,2,3,4,5,6] B = [7,8,9,10,11,12] Perform the following operations using numpy and illustrate its output: i. concatenate ii. stack along column axis iii. hstack iv. vstack v. dstack vi. search even values in array A vii. sort array B viii. split array A into 2 D array	8	L2	1	5
	(OR)				
	(B) Illustrate the Data Science process in detail, outlining its key steps, methodologies and significance of each phase in extracting meaningful insights.	8	L2	1	5

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	5

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Department of Computer Science & Engineering

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Academic Year: 2024-25 (EVEN)

Test : Internal Examination II	**Date & Session : 17.03.2025 AN**
Course Code & Title : 21CSS303T Data Science	**Duration: 1 Hour 30 Minutes**
Year & Sem : 3rd & 6Th	**Max. Marks: 50**

Part - A

Answer all questions **(10 x 1 = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	A database system designed for high-speed data ingestion and retrieval in big data applications is called. A) Relational Database B) NoSQL Database C) Excel Spreadsheet D) Text File	1	2	2	5
2	A framework that processes massive datasets by dividing tasks across multiple nodes is A) MapReduce B) Single-core Processing C) Manual Sorting D) Flat File System	1	2	2	5
3	A cloud storage service used for scalable and distributed data storage is: A) Google Drive B) Amazon S3 C) External Hard Drive D) Local Database	1	2	2	5
4	The primary data structures used in Pandas for data manipulation are: A) List and Tuple B) Series and Data Frame C) Dictionary and Set D) Array and Matrix	1	1	2	5
5	One common issue when processing large datasets is: A) Limited memory availability B) High battery consumption C) Slow keyboard response D) Screen brightness reduction	1	3	2	5
6	The operation that stacks multiple Data Frames either vertically or horizontally is called. A) Concatenation B) Filtering C) Sorting D) Grouping	1	1	3	5
7	The format commonly used to send and receive data in Web APIs is. A) JSON B) MP3 C) JPEG D) DOCX	1	1	3	5
8	What is the primary purpose of open data sources? A) To provide free access to publicly available data B) To restrict data usage to specific users C) To sell data for commercial purposes D) To keep data private and confidential	1	1	3	5
9	Which file format is commonly used for sharing open data due to its simplicity and compatibility? A) CSV B) MP4 C) EXE D) PSD	1	2	3	5

10	What is an example of a government open data platform? A) data.gov B) Spotify C) LinkedIn D) Instagram	1	1	3	5

Part B

Answer any two questions **4M x 2Q = 8 Marks**

11	Discuss the challenges and solutions to deal with a large amount of data.	4	2	2	5
12	How are the data in Pandas combined together? Discuss all the possible ways.	4	3	2	5
13	How can duplicate records be identified and removed, and what is their impact on data analysis?	4	2	2	5

Part C

Answer any two questions **4M x 2Q = 8 Marks**

14	How can Pandas functions be used to overcome the challenges that arise when working with a multi-index data frame?	4	3	3	5
15	How do you handle time-series data preprocessing differently from other types of data?	4	3	3	5
16	Explain how do you reduce computational time while performing complex data transformations on big data?	4	2	3	5

Part D

Answer all questions **12M x 2Q = 24 Marks**

17	(A) Give an explanation of the structure of a Pandas Dataframe, how it differs from a Series, write the key functionalities that make it valuable for data analysis.	12	2	2	5
	(OR)				
	(B) Explain Pandas' handling of data alignment during arithmetic operations when working with dataframes and series.	12	2	2	5
18	(A) Discuss the challenges encountered when merging and combining datasets, such as handling missing values, duplicate entries, and performance issues. How can these challenges be mitigated?	12	3	3	5
	(OR)				
	(B) Explain the importance of open data initiatives in promoting transparency and public engagement.	12	3	3	5

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	0	5

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Delhi – Meerut Road, Sikri Kalan, Ghaziabad, Uttar Pradesh – 201204
Academic Year: 2024-25 (EVEN)

Test : Internal Examination III
Course Code &Title :21CSS303T Data Science
Year & Sem :III /VI

Date & Session : 05/05/25 (AN)
Duration: 1 Hour 30 Minutes
Max. Marks: 50

Part - A
Answer all questions **(10Q x 1M = 10 Marks)**

Q. No	Questions	Marks	BL	CO	PO
1	**What does the .pivot() method in Pandas do?** A) It converts long-format data into wide-format data by creating new columns for unique values in one column. B) It converts wide-format data into long-format data. C) It creates a pivot table by calculating summary statistics for a given set of columns. D) It performs an element-wise operation on a DataFrame.	1	3	4	5
2	**In the context of data reshaping, what is the purpose of the .melt() function in Pandas?** A) To convert a DataFrame from wide format to long format. B) To combine multiple columns into a single column. C) To change the data type of a column. D) To split a single column into multiple columns.	1	2	4	5
3	**What does the .reshape() method in NumPy do?** A) It changes the shape of an array without changing its data. B) It pivots data in a DataFrame. C) It merges multiple arrays into one. D) It deletes specific rows or columns from an array.	1	2	4	5
4	**When using .pivot_table() in Pandas, which of the following is the default aggregation function when there are multiple values for a given index/column combination?** A) 'sum' B) 'mean' C) 'min' D) 'count'	1	3	4	5
5	**Which method in Pandas is used to "stack" columns into rows, effectively turning the columns into a single column of values?** A) .unstack() B) .stack() C) .pivot() D) .reshape()	1	4	4	5
6	**Which of the following functions in Matplotlib is used to display a plot?** A) plt.show() B) plt.plot() C) plt.legend() D) plt.axis()	1	3	5	5
7	**In Seaborn, which function is used to create a heatmap from a 2D dataset (such as a correlation matrix)?** A) sns.barplot() B) sns.scatterplot() C) sns.heatmap() D) sns.histplot()	1	4	5	5
8	**What is the default color palette used in Seaborn for visualizing categorical data?** A) 'Set1' B) 'deep'	1	3	5	5

C) 'viridis'
D) 'cubehelix'

9	**In Matplotlib, which function is used to create a bar plot?** A) plt.hist() B) plt.plot() C) plt.bar() D) plt.scatter()	1	3	5	5
10	**In Seaborn, what is the purpose of the sns.pairplot() function?** A) It creates a pair of categorical bar plots. B) It creates a matrix of scatter plots between pairs of variables in a DataFrame. C) It plots a single histogram for each column. D) It creates a time series plot.	1	4	5	5

Part B

Answer any two questions — **2Q x 4M = 8 Marks**

11	How does the presence of missing data impact model performance	4	3	4	5
12	What are the best practices for visualizing missing data patterns	4	4	4	5
13	How can binning help in handling skewed distributions	4	3	4	5

Part C

Answer any two questions — **2Q x 4M = 8 Marks**

14	How can the use of subplots in Matplotlib be leveraged to improve the clarity and comparison of multiple visualizations	4	3	5	5
15	Compare and contrast the use of seaborn'ssns.pairplot() and matplotlib'splt.scatter() for visualizing relationships between multiple continuous variables.	4	4	5	5
16	How would you approach visualizing categorical data with a large number of categories in Seaborn using sns.barplot() or sns.countplot()	4	3	5	5

Part D

Answer all questions — **2Q x 12M = 24 Marks**

17	(A)In which scenarios would you prefer to use binning over continuous variable input for machine learning models, and what are the potential benefits and drawbacks of discretizing continuous data?	12	4	4	5
	(OR)				
	(B)How can the impact of missing data be measured and evaluated, and what metrics or techniques can be used to assess the effect of missing values on the final model's performance?	12	4	4	5
18	(A)How does Matplotlib handle the creation of subplots, and what are the advantages and challenges of managing subplot layouts in complex visualizations with multiple variables or data points?	12	5	5	5
	(OR)				
	(B)How does Seaborn handle categorical data visualization, and how does it differ from the way Matplotlib handles categorical data? What are the advantages of Seaborn's approach?	12	5	5	5

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Academic Year: 2024-25 (EVEN)

Test : Internal Examination I
Course Code & Title : 21CSE356T& Natural language Processing
Year & Sem : III year/ VI sem

Date& Session : 04.02.2025&AN
Duration: 1 Hour
Max. Marks: 30

Part - A

Answer all questions **(10Q x 1M = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Recommending products to users based on their reviews and preferences can be achieved using: A) Sentiment Analysis B) Text Summarization C) Recommendation Systems with NLP D) Language Generation	1	1	1	1
2	In Natural Language Processing, which method assigns weights to terms based on their importance in a document relative to a collection of documents? A) Term Frequency (TF) B) Inverse Document Frequency (IDF) C) Bag of Words D) Named Entity Recognition	1	1	1	1
3	Named Entity Recognition (NER) is primarily used to identify: A) Part-of-speech tags in a sentence B) Entities such as names, dates, and locations in text C) Root forms of words in text D) The probability of word sequences	1	1	1	2
4	In text processing, combining Term Frequency (TF) and Inverse Document Frequency (IDF) results in: A) N-grams B) TF-IDF C) Smoothing D) Feature Extraction	1	2	1	2
5	N-grams represent: A) Word embeddings for text B) Consecutive sequences of words or characters in text C) Named entities in a sentence D) Root forms of words	1	1	1	1
6	Smoothing techniques in NLP are applied to: A) Handle unseen events or zero probabilities in language models B) Remove stop words from text C) Combine multiple features for classification D) Normalize text data	1	1	1	2
7	Morphological analysis is concerned with: A) The structure and formation of words B) Identifying entities in text C) Generating features from documents D) Smoothing probability distributions	1	1	1	1
8	The primary goal of feature extraction in NLP is to: A) Convert text into a structured format for machine learning models B) Remove irrelevant text data C) Identify grammatical errors in text D) Recognize named entities	1	1	1	2
9	Part-of-Speech (POS) tagging involves assigning:	1	2	1	2

A) Weights to words in a document
B) Grammatical categories to words in a sentence
C) Root forms to words
D) Entities to names and locations

10	Extracting customer opinions and classifying them as positive, negative, or neutral refers to: A) Sentiment Analysis B) Named Entity Recognition C) Text Classification D) Part-of-Speech Tagging	1	2	1	2

Part B
Answer any three questions **3Q x 4M=12 Marks**

11	Define NLP and explain its different levels	4	1	1	2
12	Differentiate between stemming and lemmatization.	4	2	1	2
13	Explain the TF-IDF Feature Extraction concept. Compute the TF-IDF for the term "Computer" in a document where: i. The term frequency (TF) of "Computer" is 5. ii. The total number of documents is 10,000. iii. The term "NLP" appears in 100 documents	4	3	1	1
14	How does POS tagging help in understanding the structure of a sentence? Provide an example of a sentence with POS tags. Discuss its various approaches.	4	1	1	2

Part C
Answer all questions ***1Q x 8M= 8 Marks***

15.	(A) Write the short note on: a) NER b) Regular Expressions c) Smoothing	8	2	1	2
	(OR)				
	(B) Define N-grams in NLP? Explain the difference between unigrams, bigrams, and trigrams. Generate bigrams from the sentence: "Machine learning is fascinating."	8	3	1	2

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Academic Year: 2024-25 (EVEN)

Test: Internal Examination II **Course Code & Title: 21CSE356T Natural language Processing** **Year & Sem: III Year / VI Sem**	**Date: 20-03-2025 AN** **Duration: 1 Hour 30 Minutes** **Max. Marks: 50**

Part - A

Answer All Questions **(10 x 1 = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Select the correct option from the following to describe ambiguous parse tree. a) Generate tree from the grammar b) Convert text into vector c) One word has two meaning d) More than one tree is generated for a single sentence.	1	1	2	1
2	Identify the correct option that best describes ambiguous word sense. a) Word has more than one meaning b) For the one word more than one tree generated c) Convert a word to vector d) Convert text into token	1	3	2	2
3	Determine which one is not a role of the parser? a) To report any syntax error b) To create parse tree c) To create symbol table d) To convert text to table	1	2	2	3
4	The option that represents a type of parser is: a) Top Down parser b) TF-IDF c) Word2Vec d) CBOW	1	2	2	1
5	Which of the following is not an element of the Syntactic analysis? a) Hyponymy b) Homonymy c) Polysemy d) Tokenization	1	1	2	2
6	Analyze the following option and determine which is not an embedding technique: a) Word2Vec b) Skip Gram c) CBOW d) Tokenisation	1	2	3	3
7	Word2vec is primarily used for: a) Semantic representation b) Reshaping the data c) Combining data d) Data normalization	1	2	3	2
8	Discourse Segmentation involves the use of: a) Sentence b) Topic c) Discourse Unit d) TF-IDF	1	2	3	3
9	Consider the following options and determine a challenge in Discourse Segmentation: a) Ambiguity b) Coherence	1	1	3	1

	c) Contextual Understanding d) Converting to vector				
10	Examine the following options and identify which is not a method of Discourse Segmentation: a) Rule Based approach b) Machine Learning based approach c) Deep Learning based approach d) Sort based approach	1	2	3	2
	Part B				
	Answer Any Two Questions	**4M x 2Q = 8 Marks**			
11	Define Context Free Grammar and its role in syntactic parsing.	4	2	2	1
12	Compare Top Down and bottom up parser with suitable example.	4	3	2	2
13	Explain Probabilistic Context Free Grammar with a suitable example.	4	2	2	2
	Part C				
	Answer Any Two Questions	**4M x 2Q = 8 Marks**			
14	Distinguish Skip Gram and CBOW technique used in NLP.	4	3	3	2
15	Discuss any four applications of Discourse.	4	2	3	1
16	Describe Text Coherence with example.	4	2	3	3
	Part D				
	Answer All Questions	**12M x 2Q = 24 Marks**			
17	A.i) Demonstrate the steps of CKY algorithm to fill the parsing table. ii) Implement CKY Parser algorithm for the given grammar: S-> NP VP NP-> Det N VP-> V NP Det->"a"|"an"|"the" N->"cat"|"rat"|"dog" V->"saw"|eat" Sentence: cat eat the rat	12	3	2	2
	OR				
	B.i) Describe three basic operations of the Early parsing algorithm. ii) Implement Early parsing for the given grammar: S-> NP VP NP-> Det N VP-> V Det->"a"|"the"|"an" N->"dog"|"cat" N->bone" V->"eat"|"sleep" Sentence: The dog sleeps	12	3	2	2
18	A) Discuss Hobbs Algorithm. Consider the sentence S1: Jack is an Engineer and S2: Kill Killed him, to explain the following: i)Coreference resolution ii)antecedent iii)anaphoric	12	3	3	2
	OR				
	B) Illustrate challenges in the Discourse analysis.	12	2	3	2

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	0	5

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Academic Year: 2024-25 (EVEN)

Test : Internal Examination III	**Date & Session : 08-05-2025 & AN**
Course Code & Title :21CSE356T & Natural Language Processing	**Duration:1 Hour 30Minutes**
Year & Sem : III & VI	**Max. Marks: 50**

Part - A

Answer all questions **(10 x 1M = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Identify the neural network commonly used in sequence modeling. A. CNN B. RNN C. DBN D. GAN	1	1	4	1
2	Select the component responsible for learning contextual word embeddings in transformers. A. Encoder B. Decoder C. Attention D. Feed-forward	1	2	4	1
3	Determine the advantage of using multi-headed attention in transformers. A. Increases memory B. Parallel attention on different subspaces C. Uses dropout D. Applies pooling	1	2	4	1
4	Recognize the model trained using masked language modeling. A. RoBERTa B. GPT-3 C. Transformer XL D. T5	1	1	4	1
5	Infer the role of self-attention in language models. A. Tokenization B. Memory reduction C. Captures dependencies D. Data augmentation	1	2	4	1
6	Choose the type of summarization that selects existing sentences from a source. A. Extractive B. Abstractive C. Query-based D. Informative	1	2	5	2
7	Identify the main function of semantic search. A. Returns matching keywords B. Retrieves contextually relevant information C. Clusters similar queries D. Filters duplicates	1	2	5	2
8	Choose the correct classification of a chatbot that uses predefined responses. A. Generative B. Extractive C. Retrieval-based D. Hybrid	1	1	5	2
9	Infer the role of Information Extraction in NLP applications. A. Classification B. Visualization C. Entity recognition and relation extraction D. Text encoding	1	2	5	2
10	Identify the most appropriate task where Machine Translation is applied. A. Spam detection B. Sentiment analysis C. Language conversion D. Anaphora resolution	1	1	5	2

Part B
Answer any two questions

(2 x 4M = 8 Marks)

11	Analyze the architecture and functioning of RNN.	4	4	4	1
12	Evaluate the significance of fine-tuning pre-trained models like BERT for text classification.	4	4	4	1
13	Define Attention Mechanism and Compare self-attention with multi-head attention.	4	3	4	1

Part C
Answer any two questions

(2 x 4M = 8 Marks)

14	Compare extractive and abstractive summarization techniques using a case example.	4	4	5	1
15	Discuss the architecture of a question answering system and explain how it processes input.	4	3	5	2
16	Analyze the difference in approach between semantic search and traditional keyword search engines.	4	4	5	2

Part D
Answer all questions

(2 x 12M = 24 Marks)

17	(A) Evaluate and compare RNN, LSTM, and transformer-based models in terms of performance, parallelization, and context handling.	12	5	4	1
	(OR)				
	(B)Analyze the impact of using pre-trained models like BERT and RoBERTa for downstream NLP tasks such as sentiment analysis and question answering.	12	4	4	1
18	(A) Elaborate the use of NLP in building retrieval-based vs. generative chatbots. Which is more suitable for customer support and why?	12	4	5	1
	(OR)				
	(B) Discuss the stages involved in building a machine translation pipeline using transformer-based models.	12	3	5	2

CSE-AI/ML-A.
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Academic Year: 2024-25 (EVEN)

Test : **Internal Examination I**
Course Code & Title : **21EEO304T, Energy Efficient Practices**
Year & Sem : **3rd/6th**

Date & Session : 06-02-2025/AN
Duration: 1 Hour
Max. Marks: 30

Part - A

Answer all questions **(10Q x 1M = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Which of the following is a non-commercial energy source? a) Electricity b) Natural gas c) Solar energy in rural households d) Diesel	1	1	1	1
2	How does the availability of commercial energy impact industrial development? a) Increases rural employment b) Enhances productivity c) Reduces energy costs d) Promotes traditional energy use	1	2	1	1
3	What distinguishes primary energy from secondary energy? a) Primary energy requires refining b) Secondary energy is derived from primary energy c) Secondary energy sources are natural d) Primary energy sources are man-made	1	2	1	1
4	Why are secondary energy resources important in modern economies? a) They are easier to store and transport b) They are directly extracted from the earth c) They are non-renewable d) They reduce primary energy demand	1	2	1	1
5	What is the role of energy infrastructure in a growing economy? a) It creates employment b) It limits urbanization c) It supports economic activities and connectivity d) It reduces GDP	1	2	1	1
6	What is the primary goal of variable/dynamic energy pricing? a) Stabilize global oil markets b) Match energy demand with supply in real-time c) Ensure constant energy production d) Support renewable energy projects	1	1	1	1
7	How do subsidies on energy affect its pricing? a) They decrease energy supply b) They increase the demand for renewable energy c) They increase government revenue d) They reduce the market price of energy	1	2	1	1
8	What is the main objective of the Energy Conservation Act? a) Promote efficient energy usage b) Increase energy prices c) Encourage fossil fuel production d) Decrease energy access in rural areas	1	2	1	1
9	When was the Bureau of Energy Efficiency (BEE) established? a) 2001	1	1	1	1

b) 2002
c) 2003
d) 2004

10	Why is BEE's star rating system important for consumers? a) It identifies cost-effective appliances b) It increases energy prices c) It promotes fossil fuel consumption d) It discourages renewable energy adoption	1	2	1	1

Part B
Answer any three questions

3Q x 4M = 12 Marks

11	Explain the advantages of commercial energy over non-commercial energy in terms of economic development.	4	2	1	1
12	Describe how secondary energy sources depend on primary energy sources for production and provide two examples.	4	2	1	1
13	What are the challenges faced by growing economies in meeting the energy demands?	4	2	1	1
14	Evaluate the impact of rising crude oil prices on the transportation sector and suggest mitigation strategies.	4	3	1	1

Part C
Answer all questions

1Q x 8M = 8 Marks

15.	(A) What is the main objective of the Energy Conservation Act, 2001, and mention the key aspects of the act?	8	1	1	1
	(OR)				
	(B) Outline the primary functions of the Bureau of Energy Efficiency (BEE) and its role in promoting energy efficiency.	8	1	1	1

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	0	5

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Academic Year: 2024-25 (EVEN)

Test : **Internal Examination II**
Course Code & Title : **21EEO304T, Energy Efficient Practices**
Year & Sem : **3rd/6th**

Date & Session : 21.03.25/AN
Duration: 1 Hour 30 Minutes
Max. Marks: 50

Part - A

Answer all questions **(10 x 1 = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Why is high voltage preferred for power transmission? a) To reduce transmission losses b) To increase current flow c) To reduce voltage fluctuation d) To eliminate transformers	1	3	2	1,7
2	How does power factor impact the efficiency of an AC system? a) Higher power factor improves efficiency b) Lower power factor reduces efficiency c) Power factor does not affect efficiency d) Both a and b	1	2	2	1,7
3	In an induction motor, the rotating magnetic field is produced in which part? a) Rotor b) Stator c) Commutator d) Brushes	1	1	2	1
4	Why is the core of a transformer laminated? a) To reduce eddy current losses b) To increase mechanical strength c) To improve insulation d) To allow cooling	1	2	2	1,7
5	How does contract demand differ from maximum demand? a) Contract demand is fixed, maximum demand varies b) Contract demand is always lower than maximum demand c) Maximum demand is always equal to contract demand d) Contract demand is used for residential billing	1	2	2	1,7
6	What is the working fluid in a vapor compression refrigeration system? a) Air b) Water c) Refrigerant d) Steam	1	1	3	1
7	What happens to the refrigerant in the evaporator of a vapor compression system? a) It condenses into liquid b) It expands and absorbs heat c) It compresses and releases heat d) It remains at a constant state	1	2	3	3

8	Which of the following refrigerant-absorbent pairs is commonly used in vapor absorption systems? a) R134a and PAG oil b) Freon and lithium bromide c) CO_2 and water d) Ammonia and water	1	1	3	1
9	Which factor has the greatest impact on HVAC energy consumption? a) Insulation quality b) Refrigerant type c) System color d) Piping material	1	1	3	1,7
10	What is the advantage of using soft starters in refrigeration compressors? a) Increases starting torque b) Decreases voltage fluctuation c) Reduces inrush current d) Eliminates compressor heat loss	1	2	3	1,7

Part B

Answer any two questions — **4 M x 2Q = 8 Marks**

11	Explain why high-voltage transmission is used in power systems.	4	2	2	1,7
12	Define maximum demand and why do industrial consumers monitor their maximum demand?	4	2	2	1,7
13	Define active power, reactive power, and apparent power with their units.	4	1	2	1,7

Part C

Answer any two questions — **4 M x 2Q = 8 Marks**

14	Explain the working principle of a vapor compression refrigeration system with a simple schematic.	4	1	3	1,7
15	Explain the working mechanism of a centrifugal compressor with a schematic.	4	1	3	1
16	What are the functions of the evaporator and condenser in an air conditioner?	4	2	3	1,7

Part D

Answer all questions — **12 M x 2Q = 24 Marks**

17	(A) Explain the classification of electrical supply systems based on voltage levels and distribution methods.	12	2	2	1
	(OR)				
	(B) Explain the construction and working principle of a three-phase induction motor with a neat diagram.	12	1	2	1
18	(A) Explain the role of power electronics in modern HVAC and refrigeration systems.	12	2	3	1,7
	(OR)				
	(B) List and briefly explain common energy-saving strategies in HVAC and refrigeration systems.	12	1	3	1,7

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	5

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Department of Computer Science and Engineering

Delhi – Meerut Road, Sikri Kalan, Ghaziabad, Uttar Pradesh – 201204

Academic Year: 2024-25 (EVEN)

Test : Internal Examination III
Course Code & Title : 21EEO304T & Energy Efficient Practices
Year & Sem : 3rd & 6th

Date & Session :09/05/2025 & AN
Duration: 1 Hour 30 Minutes
Max. Marks: 50

Part - A

Answer all questions **(10 x 1M = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	High Intensity Discharge (HID) lamps are used in (a) Residential lighting (b) Commercial lighting (c) Industrial lighting (d) Both in Residential & Commercial lighting	1	2	4	1
2	Lumen is the unit of: (a) Voltage (b) Resistance (c) Energy output (d) Light output	1	1	4	1
3	LED is considered more energy efficient than incandescence lamp because it (a) Has higher resistance (b) emits more heat (c) Has lower luminous efficacy (d) Has lower energy consumption for the same light output	1	2	4	1
4	A building uses 100 incandescent bulbs (60W each) and wants to switch to LEDs (10W each). What is the percentage reduction in power? (a) 90.33% (b) 83.33% (c) 75.33% (d) 60.33%	1	3	4	1
5	Which of the following provides the best lighting efficiency and lifespan? (a) Incandescent + low cost (b) CFL + moderate lifespan (c) LED + high efficiency (d) Halogen + high cost	1	3	4	1
6	If an industry uses variable frequency drives (VFDs) in motors, what impact does it have? (a) Improve energy efficiency (b) Increase energy usage (c) Reduce control (d) Increase carbon emissions	1	4	5	1
7	Industrial energy efficiency improves primarily by: (a) Using older machines (b) Reducing automation (c) Applying efficient technologies (d) Increasing working hours	1	2	5	1
8	A plant replaces an old motor with a new high-efficiency motor, reducing energy use from 10 kW to 7.5 kW. What is the energy saving per hour?	1	3	5	1

(a) 1.5 kWh (b) 2.5 kWh (c) 3.5kWh (d) 4.5kWh

9	Which of the following is a challenge in implementing energy efficiency in industries? (a) Availability of skilled labor (b) High initial investment (c) Low energy prices (d) Excess production capacity	1	2	5	2.6
10	Energy audits help industries by: (a)Reducing labor force (b) Increasing production downtime (c)Enhancing marketing strategies (d) Identify energy saving opportunities	1	2	5	1,6

Part B
Answer any two questions

(2 x 4M = 8 Marks)

11	Define the term with suitable example: (a) Illuminance (b) Colour rendering index	4	1	4	1
12	Explain the design consideration for efficient lighting system in terms of colour temperature selection.	4	4	4	1,3
13	What is the role of distributed generation in energy efficiency?	4	2	4	1

Part C
Answer any two questions

(2 x 4M = 8 Marks)

14	What are the key components of automation and control systems?	4	2	5	1,7
15	Explain how variable frequency drives (VFDs) improve motor efficiency in industries.	4	3	5	3,7
16	Explain the importance of energy efficiency in Industries.	4	2	5	1,7

Part D
Answer all questions

(2 x 12M = 24 Marks)

17	(A) Explain the working principle and their features of different types of lamps	12	1	4	1
	(OR)				
	(B) Explain how the energy efficiency in lighting system plays a key role in energy saving opportunities.	12	1	4	1,6
18	(A) List out the main challenges faced in improving the energy efficiency in industries	12	1	5	2,6
	(OR)				
	(B) What are industrial sensors? Explain all the types and applications of industrial sensors	12	2	5	1,5

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DELHI-NCR CAMPUS, GHAZIABAD (U.P)

Academic Year: 2024-25 (EVEN)

Test : Internal Examination-I **Date & Session : 04/02/2025 (FN)**
Course Code & Title: 21CSC303J/Software Engg. & Project Mgmt. Duration: 1 Hour
Year & Sem : III Year/VI Sem **Max. Marks: 30**

Part - A

Answer all Questions **(10Q x 1M = 10 Marks)**

Q.N.	Question	Marks	BL	CO	PO
1.	Which software engineering methodology has gained prominence due to the need for adaptability and rapid delivery? a) Waterfall model b) Agile methodology c) V-Model d) Structured programming	1	L1	1	9
2.	The topmost layer in the layered technology framework is a) Process b) Methods c) Tools d) Quality focus	1	L2	1	9
3.	_____ phase of SDLC involves creating the system's architecture and high-level design. a) Coding b) Design c) Testing d) Deployment	1	L2	1	11
4.	In Agile development, what is the term for short development cycles? a) Phases b) Iterations c) Modules d) Milestones	1	L2	1	9
5.	Typical duration of a sprint in Scrum is a) 1-4 weeks b) 1-2 days c) 1-3 months d) 6 months	1	L2	1	11
6.	Which of the following is NOT one of the triple constraints in project management? a) Scope b) Cost c) Time d) Testing	1	L1	1	9
7.	Primary artifact in Scrum that lists all desired work on a project is a) Sprint Backlog b) Product Backlog c) Burn-Down Chart d) Increment	1	L2	1	9

8.	In layered technology, which layer includes techniques for analysis, design, coding, testing and maintenance? a) Process b) Methods c) Tools d) Quality focus	1	L2	1	9
9.	In which SDLC phase software delivered to the customer and monitored for performance? a) Maintenance b) Testing c) Deployment d) Design	1	L1	1	11
10.	A process model divides into sequential phases like initiation, planning, execution and closure named as a) Agile b) Waterfall c) Kanban d) Scrum	1	L2	1	9

Part - B
Answer any Three Questions **3Q x 4M = 12 Marks**

11.	How does communication gaps between teams (e.g., developers and testers) affect the success of an SDLC project?	4	L3	1	11
12.	What would happen if one phase of the software development life cycle is skipped or not performed adequately?	4	L3	1	11
13.	Describe the four layers of software engineering layered technology. How do they interact with each other?	4	L2	1	9
14.	How can a team handle disruption (e.g., urgent change requests) during an ongoing sprint?	4	L3	1	9

Part - C
Answer all Questions **1Q x 8M = 8 Marks**

15.	(a) **Scenario**: A company is developing a billing software for a government agency. The agency has strict and well-documented requirements that are unlikely to change. I. Why would the Waterfall model be suitable for this project? II. What are the risks if a critical flaw in the design is discovered during testing?	8	L4	1	11
	(OR)				
	(b) How does Agile methodology ensure continuous delivery of value to customers?	8	L3	1	9

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	0	5

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Academic Year: 2024-25 (EVEN)

Test	**: Internal Examination II**	**Date& Session**	**:19/03/2025 AN**
Course Code & Title	**: 21CSC303J & SEPM**	**Duration**	**: 1 Hour 30 Minutes**
Year & Sem	**:3rd & 6th**	**Max. Marks**	**: 50**

Part - A

Answer all questions **(10 x 1 = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Non-functional requirements mainly deal with: a) Features and functionalities of the system b) Performance, security, and usability of the system c) Business rules of the system d) Database design of the system	1	1	2	2
2	Which of the following is a functional requirement? a) The system should be easy to use b) The system should allow users to log in using a username and password c) The system should handle 1000 concurrent users d) The system should respond within 2 seconds	1	2	2	2
3	What is the primary purpose of a Software Requirements Document (SRD)? a) To describe the architecture of the system b) To define the functionalities and constraints of the software c) To write the source code of the system d) To create test cases for the system	1	1	2	1
4	What is the general equation used in the Basic COCOMO Model? a) Effort = a * (KLOC)^b b) Effort = (KLOC) / a c) Effort = a + b * (KLOC) d) Effort = (KLOC)^b / a	1	4	2	2
5	Why is requirements management important in software development? a) It helps in controlling changes in requirements b) It speeds up the coding process c) It eliminates the need for testing d) It removes the need for stakeholder involvement	1	2	2	1
6	In software design what is cohesion? a) The degree to which a module performs a single, well-defined task b) The number of errors in a module c) The number of functions in a module d) The level of interaction between modules	1	1	3	2
7	In a GUI what is the main benefit of icons? a) To make the interface look colorful b) To replace all text-based instructions c) To provide a visual representation of commands or functions d) To reduce system memory usage	1	3	3	2
8	Key characteristic of a good software architecture is:- a) High coupling b) Scalability and flexibility c) Lack of documentation d) Monolithic design	1	2	3	2

9	The purpose of UML is. a) To develop database schemas b) To design and visualize software systems c) To perform software testing d) To write source code	1	2	3	1
10	What do you mean by coupling? a) The measure of how strongly one module depends on another b) The measure of the number of lines in a program c) The process of writing unit test cases d) The speed of execution of the software	1	3	3	1

Part B

Answer any two questions — **4M x 2Q=8 Marks**

11	Differentiate between User Requirements and System Requirements.	4	3	2	2
12	Why is the Software Requirements Document important?	4	3	2	1
13	Write the importance of requirements management in software development?	4	4	2	2

Part C

Answer any two questions — **4M x 2Q=8 Marks**

14	How does software design relate to software development?	4	3	3	1
15	Why is data design important in software development?	4	2	3	1
16	When UML help in software documentation? Justify it.	4	4	3	2

Part D

Answer all questions — **12M x 2Q= 24 Marks**

17	(A) Explain the COCOMO model in software engineering. Write its purpose and importance in project estimation.	12	3	2	2
	(OR)				
	(B) What is the Requirements Engineering Process? Explain its role in software development.	12	2	2	2
18	(A) Discuss the key objectives and principles of software design.	12	2	3	1
	(OR)				
	(B) Write the role of UML (Unified Modeling Language) in software design. Explain different UML diagrams used for designing software.	12	4	3	1

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	0	5

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Department of Computer Science and Engineering

Delhi – Meerut Road, Sikri Kalan, Ghaziabad, Uttar Pradesh – 201204

Academic Year: 2024-25 (EVEN)

Test : Internal Examination III
Course Code & Title :21CSC303J & Software Engineering and Project Management
Year & Sem :3rd & 6th

Date & Session : 07/05/2025 & AN
Duration: 1 Hour 30 Minutes
Max. Marks: 50

Part - A

Answer all questions **(10 x 1 = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	In a walkthrough, who leads the session? A. Quality Assurance Engineer B. Developer who wrote the code C. Project Manager D. Independent reviewer	1	1	4	9,11
2	Select the white box testing technique? A. Equivalence partitioning B. State transition testing C. Path testing D. Error guessing	1	1	4	11
3	In an inspection process, which role is responsible for recording all defects? A. Moderator B. Reader C. Recorder D. Presenter	1	1	4	11
4	A tool best suited for automating unit tests in Java is ..... A. Selenium B. JUnit C. Postman D. WinRunner	1	1	4	9
5	A coding framework typically provides: A. Business logic B. Compilers for various languages C. Reusable code components and structure D. Hardware abstraction layers	1	2	4	9
6	Proactive risk strategies involve: A. Fixing bugs after release B. Reacting to user complaints C. Preventing risks through early identification and planning D. Ignoring minor risks to save time	1	1	5	11
7	Identify a type of software maintenance from the given list. A. Adaptive B. Transformational C. Transitional D. Active	1	3	5	11
8	Preventive maintenance focuses on: A. Fixing bugs after release B. Adapting the system to new hardware C. Making changes to improve future maintainability D. Addressing user complaints	1	4	5	9

9	A product release cycle does not include..... A. Beta testing B. Stakeholder review C. Final exam testing D. Packaging and deployment	1	1	5	9
10	What is the purpose of risk refinement? A. Estimate project costs B. Break down risks into more manageable, traceable components C. Eliminate all risk D. Finalize testing strategy	1	1	5	9

Part B

Answer any two questions — **4M x 2Q = 8 Marks**

11	Differentiate between desk checks, walkthroughs, and formal inspections in terms of process, participants, and outcomes. In what scenarios would each be most appropriate?	4	2	4	9
12	Illustrate with example, how adherence to coding standards and the use of coding frameworks can reduce long-term software maintenance costs.	4	3	4	11
13	Evaluate the concept of Pair Programming in terms of Quality and Performance.	4	5	4	9

Part C

Answer any two questions — **4M x 2Q = 8 Marks**

14	Classify the types of software risks for any development projects. For each risk, suggest one possible mitigation strategy.	4	4	5	9
15	Compare and contrast adaptive and corrective maintenance. Give one scenario for each where it would be the appropriate maintenance type.	4	5	5	9
16	Examine the role of software reengineering in improving the maintainability of legacy systems? Mention at least two reengineering activities and their benefits.	4	5	5	9

Part D

Answer all questions — **12M x 2Q = 24 Marks**

17	(A) Propose a combined black-box and white-box testing plan for a payment processing module. Justify the choice of test techniques at each stage of testing, including specific examples of test cases.	12	6	4	9,11
	(OR)				
	(B) Explain the differences among Unit Testing, Integration Testing, Validation Testing, and System Testing in terms of objectives, inputs, and outcomes. Provide practical examples of bugs that would typically be caught at each level.	12	2	4	9
18	(A) Develop a comprehensive RMMM plan for a software project aimed at launching a mobile banking application.	12	6	5	11
	(OR)				
	(B) "A successful product release is not just about functionality, but about coordination, planning, and risk preparedness." Assess this statement by outlining the key components of product release management.	12	5	5	9

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Delhi – Meerut Road, Sikri Kalan, Ghaziabad, Uttar Pradesh – 201204

DELHI-NCR CAMPUS, GHAZIABAD (U.P)

Academic Year: 2024-25 (EVEN)

Test : **Internal Examination I**
Course Code & Title : **21CSE355T & Data Mining and Analytics**
Year & Sem : **3rd & 6th**

Date & Session : 06/02/25 & FN
Duration: 1 Hour
Max. Marks: 30

Part - A

Answer all questions **(10Q x 1M = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Identify which of the following is NOT a data cleaning technique? a. Filling missing values b. Removing duplicates c. Normalization d. Detecting and correcting outliers	1	1	1	1
2	Main objective of discretization in data preprocessing: a. To convert continuous data into categorical data b. To remove duplicate records c. To detect missing values d. To apply normalization to the data	1	2	1	1
3	The goals of feature selection are to: a. Create new features from preexisting ones b. Choose relevant attribute to reduce the dimensionality of the data c. Normalize the range of data attributes d. Detect and deal with missing data.	1	2	1	2
4	Primary goal of data discretization is a. Transforming continuous data into categorical data b. Eliminating duplicate entries c. Identifying missing values d. Normalizing the data are the first three steps.	1	2	1	1
5	Which of these tasks is NOT related to data mining? a. Sorting b. Clustering, c. Classification d. Association Rule Mining	1	1	1	2
6	Curse of dimensionality in data mining is refer to a. A situation in which an excessive number of records renders the dataset unmanageable b. A challenge in evaluating high-dimensionality data c. An issue in which categorical data cannot be handled d. Information loss during data reduction	1	2	1	2
7	Lossy Compression in data compression deals a. Without any data loss b. With some data lost but the essence retained c. With numerical data converted to text d. With noise removal as the main goal.	1	1	1	4
8	In tight coupling data integration, data from multiple sources is: a. Accessed dynamically without storing it in one place b. Combined into a unified physical storage like a data warehouse c. Integrated only during query execution d. Left in its original format across distributed systems	1	2	1	2

9	"Data heterogeneity" in context of data integration means a. Data redundancy among several sources b. Data stored in various formats and structures c. Missing attribute data d. Completely normalized data	1	1	1	1
10	"Feature scaling" in data transformation is used for a. eliminating highly correlated features b. scaling features to fall inside a given range. c. Using data that already exists to create new features d. combining related features into one	1	1	1	1

Part B

Answer any three questions **3Q x 4M = 12 Marks**

11	Explain the architecture of data mining in detailed manner.	4	2	1	2
12	Interpret the requirement of data reduction in decision making for analytical purpose.	4	2	1	2
13	Examine all the patterns in data mining.	4	3	1	2
14	Outline the differences between data mining and machine learning and also between data analysis and data analytics.	4	3	1	5

Part C

Answer all questions **1Q x 8M = 8 Marks**

15.	(A) Summarize various data preprocessing techniques in detailed manner.	8	2	1	5
	(OR)				
	(B) Illustrate various types of data objects and attributes in data mining	8	3	1	5

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Department of Computer Science & Engineering

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SRM DELHI-NCR CAMPUS, GHAZIABAD (U.P.)

Academic Year: 2024-25 (EVEN)

Test : Internal Examination-II
Course Code & Title : 21CSE355T/Data Mining and Analytics
Year & Sem : III/VI

Date & Session: 21/03/2025 (FN)
Duration: 1 Hour & 30 Minutes
Max. Marks: 50

Part - A

(1M x 10Q = 10 Marks)

Answer All Questions

Q.N.	Question	Marks	BL	CO	PO
1.	Which algorithm is commonly used for Market Basket Analysis? a) K-means clustering c) Decision Trees b) Apriori algorithm d) Naïve Bayes	1	L1	2	1
2.	The association rules in Market Basket Analysis can be described by a) If {Item A} then {Item B} b) If {Customer 1} then {Customer 2} c) If {Rule 1} then {Rule 2} d) If {Sales increase} then {Profit Increases}	1	L2	2	2
3.	The difference between Apriori and FP-growth is a) Apriori generates candidate itemsets, while FP-Growth does not b) FP-Growth is slower than Apriori c) Apriori uses trees for storing data, while FP-Growth does not d) FP-Growth cannot mine frequent itemsets	1	L2	2	2
4.	If the minimum support value is set too high, then what will happen a) Fewer frequent itemsets will be found b) More frequent itemsets will be found c) The dataset will increase in size d) The algorithm will stop working	1	L2	2	1
5.	In association rule mining, what does "Support" measure? a) The number of times a rule is violated b) The probability of occurrence of an itemset in the dataset c) The correlation between two independent variables d) The accuracy of a classification model	1	L2	2	2
6.	The main purpose of pruning in decision trees is a) To increase the tree depth c) To convert a decision tree into a neural network b) To reduce overfitting d) To improve computational complexity	1	L1	3	2
7.	What does ID3 stand for? a) Iterative Dichotomiser 3 c) Information Data 3 b) Intelligent Decision 3 d) Inductive Decision Tree 3	1	L1	3	1
8.	The impurity measure used by CART for classification tree is a) Entropy c) Mean Squared Error b) Ginni Index d) Pearson Correlation	1	L2	3	2
9.	In Bayes' Theorem, what does P(A | B) represent? a) The prior probability of event A b) The probability of event B given event A c) The posterior probability of event A given B d) The probability of both A and B occurring	1	L1	3	2
10.	Discrete and continuous attributes can be handled by a) ID3 c) Apriori b) CART d) K-means	1	L2	3	2

Part - B

Answer Any Two Questions — **4M x 2Q = 8 Marks**

11.	Discuss the concept of association rule mining along with an example.	4	L2	2	1
12.	Justify the significance of using multiple levels in association rule mining. How it differs from single-level association rules.	4	L3	2	2
13.	With the help of an example examine the role of support and confidence in Apriori algorithm.	4	L1	2	2

Part - C

Answer Any Two Questions — **4M x 2Q = 8 Marks**

14.	Examine the importance of attribute selection measures in decision trees. What are the main criteria used for selecting the best attribute.	4	L1	3	2
15.	Discuss the basic concept and working principle of Naïve Bayes Classification.	4	L1	3	2
16.	Compare pre pruning and post pruning in decision tree.	4	L2	3	1

Part - D

Answer All Questions — **12M x 2Q = 24 Marks**

17. **(a)** Discuss about mining of closed frequent itemsets. Identify closed itemsets on following dataset. Minimum Support= 3 — 12 | L3 | 2 | 2

TID	List of items
T1	A,B,C,D
T2	A,B,C,D
T3	A,B,C
T4	B,C,D
T5	C,D

(OR)

(b) Compare Apriori and Eclat in terms of data representation. Explain how does Eclat algorithm work in vertical format mining with an example. — 12 | L3 | 2 | 2

18. **(a)** A company wants to classify whether a customer will buy a laptop or not (Yes or No). Generate decision tree for following dataset: — 12 | L3 | 3 | 2

Customer	Income	Student	Buys Laptop
C1	High	No	No
C2	High	No	No
C3	Medium	No	Yes
C4	Low	Yes	Yes
C5	Low	Yes	Yes
C6	Low	No	No
C7	Medium	No	Yes
C8	High	Yes	Yes
C9	High	Yes	Yes
C10	Low	Yes	Yes

(OR)

(b) Describe the steps involved in building a CART decision tree along with an example. — 12 | L2 | 3 | 2

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	0	5

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DELHI-NCR CAMPUS, GHAZIABAD (U.P.)

Academic Year: 2024-25 (EVEN)

Test: Internal Examination III
Course Code & Title: 21CSE355T Data Mining & Analytics
Year & Sem: 3rd Year/6th Sem

Date & Session :09/05/2025 & FN
Duration: 1 Hour 30 Minutes
Max. Marks: 50

Part - A

Answer all questions **(10 x 1 = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Which of the following is NOT a clustering algorithm? a) K-Means b) DBSCAN c) Linear Regression d) Hierarchical Clustering	1	1	4	1
2	In K-Means clustering, what does 'K' represent? a) Number of iterations b) Number of data points c) Number of clusters d) Kernel used	1	1	4	1
3	The concept of clustering belongs to which type of machine learning? a) Supervised Learning b) Unsupervised Learning c) Reinforcement Learning d) Semi-supervised Learning	1	1	4	2
4	Which of the following clustering algorithms can find arbitrarily shaped clusters? a) K-Means b) DBSCAN c) K-Medoid d) KNN	1	2	4	2
5	The main idea behind Hierarchical Clustering is defined by a) Assigning data points to clusters randomly b) Building a hierarchy of clusters c) Using neural networks to identify clusters d) Maximizing distance between all points	1	2	4	1
6	The outlier in a dataset can be defined by which of the following: a) A value that is most common in the data b) A value that lies far away from the rest of the data c) A missing value in the dataset d) A duplicated value in the dataset	1	1	5	1
7	In machine learning, outliers can lead to: a) Improved model performance b) Overfitting c) More robust models d) Better generalization	1	1	5	1
8	What does the IQR (Interquartile Range) measure? a) Mean of the dataset b) Range of outliers c) Spread of middle 50% of the data d) Standard deviation of data	1	2	5	1
9	The quantity which is most affected by outliers a) Median b) Mean c) Mode d) Standard deviation	1	1	5	1
10	Out of the following which is NOT a valid technique for detecting outliers? a) Z-score b) IQR (Interquartile Range) c) Principal Component Analysis d) Isolation Forest	1	2	5	1

Part B

Answer any two questions — **4M x 2Q=8 Marks**

11	Differentiate between K-means and K-medoid clustering algorithms?	4	2	4	2
12	Explain the hierarchical clustering? Give the differences between agglomerative and divisive clustering?	4	3	4	2
13	Describe the concept of BIRCH algorithm for clustering?	4	3	4	2

Part C

Answer any two questions — **4M x 2Q=8 Marks**

14	Discuss in detail about the various types of outliers?	4	3	5	2
15	Illustrate the Univariate outlier detection with the help of an example?	4	3	5	2
16	Explain the role of data mining for financial data analysis?	4	4	5	2

Part D

Answer all questions — **12M x 2Q= 24 Marks**

17	(A) Describe K-Means clustering and give its algorithm? Write its advantages and limitations? The points with their x and y coordinates are given, use K-means clustering to solve the problem given below:	12	5	4	2

Point	x	y
A	2	10
B	2	5
C	8	4
D	5	8
E	7	5
F	6	4

(OR)

	(B) Explain the DBSCAN clustering? Given the points A(3, 7), B(4, 6), C(5, 5), D(6, 4), E(7, 3), F(6, 2), G(7, 2) and H(8, 4), Find the core points, border points and outliers using DBSCAN and form the final clusters. Take Eps = 2.5 and MinPts = 3.	12	4	4	2
18	(A) Explain the concept of outlier analysis? Give the challenges in detecting outliers? Discuss in detail about various methods used for detecting outliers with the help of an example?	12	4	5	2

(OR)

	(B) Describe the Statistical approaches for Data Mining. Describe in detail the role of Data Mining in Intrusion Detection system?	12	4	5	2

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SRM Institute of Science and Technology
Department of Computer Science and Engineering
Delhi – Meerut Road, Sikri Kalan, Ghaziabad, Uttar Pradesh – 201204

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DELHI-NCR CAMPUS, GHAZIABAD (U.P)

Academic Year: 2024-25 (EVEN)

Test : **Internal Examination I**
Course Code & Title : **21CSC304J-Compiler Design**
Year & Sem : **III/VI**

Date & Session : 03/02/25-AN
Duration : 1 Hour
Max. Marks: 30

Part - A

Answer all questions **(10Q x 1M = 10 Marks)**

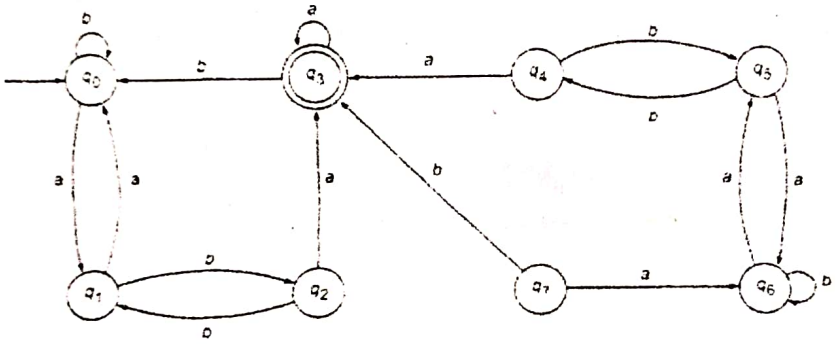
Q. No	Question	Marks	BL	CO	PO
1	Suppose there is a compiler for C language that can generate code for Computer A. Which of the following statements is true a) It can be used for Computer A only b) It can be used for any computer c) It can be used only for computers with similar processor and operating system d) It can be used only for computers with similar processor, operating system and peripherals	1	1	1	2
2	Task of a compiler is to a) Translate the whole program to machine language b) Translate one statement of the program at a time c) Translate one statement at a time and execute it d) Both a and c	1	1	1	2
3	Lex specification file sections are demarcated by a) % b) {% c) %} d) %%	1	1	1	2
4	Which of these is not true about Symbol Table a) All the labels of the instructions are symbols b) Table has entry for symbol name address value c) Perform the processing of the assembler directives d) Created during pass 1	1	1	1	2
5	Error recovery helps to a) Report multiple errors b) Rectify multiple errors c) Both report and rectify multiple errors d) Neither rectify nor report	1	1	1	1
6	What is the language accepted by following regular expression? 0*(1(01*0)*1)*0*0 a) Binary representation of multiples of 6 b) Binary representation of multiples of 4 c) Binary representation of multiples of 3 d) Binary representation of multiples of 2	1	2	1	1
7	The output of lexical analyzer is a) A set of regular expressions b) Syntax tree c) Set of tokens d) String of characters	1	1	1	1
8	Intermediate code helps in a) Program Analysis b) Code optimization c) Retargeting code d) Code check	1	1	1	1
9	Regular expression for the language L = {w ϵ {0, 1}* | w has no pair of consecutive zero} is a) (1 +010)* b) (01 + 10)* c) (1 +01)*(0 + Ɛ) d) (1 + 010)*(0 + Ɛ)	1	2	1	2
10	Which of the following is true? a) A language accepted by a regular expression is also accepted by some NFA and some DFA. b) A language accepted by a regular expression is also accepted by some NFA but not necessarily accepted by a DFA. c) A language accepted by a regular expression may not be accepted by any NFA or DFA. d) A language accepted by a regular expression is accepted by some DFA but not necessarily accepted by an NFA.	1	1	1	1

Part B
Answer any three questions — **3Q x 4M = 12 Marks**

11	Elaborate the various phases of compilation process with a suitable example.	4	3	1	1
12	How do you group the various phases of compiler? Will this have any advantage on compilation of source program.	4	1	1	2
13	What is input buffering? How it is been done?	4	3	1	1
14	Design a regular expression for a language L={a^{m}b^n:m,n>=0 } i. m+n is even ii. m+n is odd	4	2	1	2

Part C
Answer all questions — **1Q x 8M = 8 Marks**

15.	(A) Design a Deterministic Finite Automata for a given regular expression- **(a+b)*a(a+b)(a+b)** using Syntax Tree method.	8	2	1	2
	(OR)				
	(B) Minimize the given Finite Automata:	8	2	1	1



Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	0	5

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DELHI NCR CAMPUS, GHAZIABAD (U.P)

Academic Year: 2024-25 (EVEN)

Test : Internal Examination II
Course Code & Title : 21CSC304J,Compiler Design
Year & Sem : 3&6

Date & Session : 18.03.2025,AN
Duration: 1 Hour 30 Minutes
Max. Marks: 50

Part - A

Answer all questions **(10 x 1 = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Which one of the following is a top-down parser? a. Recursive descent parser. b. Operator precedence parser. c. An LR(k) parser. d. An LALR(k) parser	1	1	2	1
2	If a state does not know whether it will make a shift operation or reduction for a terminal is called a. Reduce conflict b. Reduce /shift conflict c. Shift conflict d. Reduce-reduce conflict	1	2	2	1
3	The left factored grammar for $A \rightarrow \propto\beta1 \mid \propto\beta2$: a. $A \rightarrow \propto A'$, $A' \rightarrow \beta1 \mid \beta2$ b. $A \rightarrow \propto A' \mid \in$, $A' \rightarrow \beta1 \mid \beta2$ c. $A \rightarrow \propto A'$, $A' \rightarrow \beta1 \mid \beta2 \mid \in$ d. $A \rightarrow A'$, $A' \rightarrow \beta1 \mid \beta2$	1	2	2	1,2
4	What is the process of finding a parse tree for a string of tokens called? a. Tokenizing b. parsing c. Recognizing d. Analyzing	1	1	2	1
5	For the grammar rules : $S \rightarrow Aa \mid Bb$, $A \rightarrow c \mid \in$,Then FIRST(S) is: $B \rightarrow a \mid b \mid \in$ a.{b,c} b.{a,b} c.{a,b,c} d. {a,b,c, ∈}	1	1	2	1,2
6	Consider the grammar E → E + n | E × n | n, For the sentence 'n + n × n',The handles are : a. n, E + n and E + n × n b. n, E + n and E + E × n c. n, n + n and n + n × n d. n, E + n and E × n	1	1	3	1,2
7	When ß (In the LR(1) item A -> ß.a, a) is not empty, the lookahead a. Will be affecting b. Does not have any affect. c. Shift will take place. d. Reduction will take place.	1	1	3	1,2
8	In which strategies, Construction of parsing table do not need the FOLLOW SET: a. SLR and Canonical LR b. Canonical LR and LALR c. SLR and LALR d. LL(1)	1	1	3	1,2

9	What is the maximum number of reduce moves that can be taken by a bottom-up parser for a grammar with no epsilon and unit-production (i.e., of type A -> ϵ and A -> a) to parse a string with n tokens? a. n/2 b. n-1 c. 2n-1 d. 2^n	1	2	3	1
10	In SLR parsing for the grammar: S→B|SabS, B→bB|∈, In state I_0 for inputs a and b : a. Both will have shift reduce conflict. b. Only a will have shift reduce conflict c. Only b will have shift reduce conflict d. No Conflicts	1	2	3	1

Part B

Answer any two questions **4M x 2Q = 8 Marks**

11	Examine Precedence and associativity among the operators in the given grammar A → A $ B |B, B→ B # C |C C→ C @ D |D, D→ d	4	2	2	1,2
12	State problems in top-down parsing. Convert following grammar to be suitable for top-down parser: S→ iCtSes/iCtS/a	4	2	2	1,2
13	Demonstrate stack implementation for Recursive Descent parser with the help of an example.	4	2	2	1,2

Part C

Answer any two questions **4M x 2Q = 8 Marks**

14	Construct the LALR parsing table for the given grammar: S →BB B→ aB / b	4	3	3	1,2
15	Define Handle and show handle pruning process with the help of example?	4	1	3	1
16	Differentiate among LR (0), SLR, Canonical LR and LALR parser.	4	2	3	1

Part D

Answer all questions **12M x 2Q = 24 Marks**

17	(A) Construct predictive parse table for the following grammar. E → E + T/T T →T *F/F F →F /a/b F → a/b (OR)	12	3	2	1,2
	(B) Differentiate between Syntax and Semantic Analysis. Illustrate types of parsers with the help of examples.	12	3	2	1,2
18	(A) Illustrate shift – reduce parser by showing its stack implementation with the help of example. (OR)	12	2	3	1,2
	(B)Construct SLR parsing table for the following grammar: S→ L = R/R L → *R/id R →L	12	3	3	1,2

Registration Number:	R	A	2	2	1	1	0	2	6	0	3	0	0	0	5

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Delhi – Meerut Road, Sikri Kalan, Ghaziabad, Uttar Pradesh – 201204

Academic Year: 2024-25 (EVEN)

Test : Internal Examination III
Course Code & Title : 21CSC304J & Compiler Design
Year & Sem : III Year / VI Sem

Date & Session : 06/05/25 & AN
Duration: 1 Hour 30 Minutes
Max. Marks: 50

Part - A

Answer all questions **(10Q x 1M = 10 Marks)**

Q. No	Question	Marks	BL	CO	PO
1	Design a prefix expression for the infix expression (a - b) / (c + d) and choose the correct option: a. / - a b + c d b. / a b + c d c. - / a b + c d d. / + a b - c d	1	5	4	2,4
2	Identify the correct postfix notation for the expression: if (a == b) then x = 5 else x = 10 a. a b == 5 x = 10 x = ? b. a b == x 5 = x 10 = ? c. a b == x 5 x 10 = = ? d. a b == 5 10 x = ?	1	4	4	2,4
3	Which of the following best explains why indirect triples were introduced? a. To use fewer registers b. To reduce the size of object code c. To allow easier code modification without changing references d. To use more registers	1	5	4	2,4
4	Identify the typical form of a three-address instruction? a. op = result operand1 operand2 b. operand1 = operand2 op operand3 c. result = operand1 op operand2 d. op operand1 operand2 operand3	1	4	4	2,4
5	Consider the production: A → B C If B.in = A.in and C.in = B.out, what types of attributes are involved? a. Only synthesized attributes b. Only inherited attributes c. Both inherited and synthesized attributes d. Neither inherited nor synthesized	1	4	4	23,4

6	Identify the optimization process used in the following code snippet:
	for (int i = 0; i < 10; i++)
	x = y + z;
	Optimized as:
	t = y + z;
	for (int i = 0; i < 10; i++)
	x = t;
	a. Constant folding b. Loop unrolling
	c. Loop-invariant code motion d. Strength reduction
		1	3	5	3,4

7	Design a transformation that preserves function but optimizes this code:
	for (i = 0; i < 100; i++)
	x = y + z;
	a[i] = x * 2;
	Which transformation best fits?
	a. Move x = y + z outside the loop b. Remove the loop entirely
	c. Replace a[i] = x * 2; with a[i] = y + z; d. Combine both statements into one without storing intermediate result
		1	5	5	3,4

8	Examine the instruction sequence: MUL R1, 2 replaced with: ADD R1, R1 . Which peephole optimization is used? a. Strength reduction b. Dead code elimination c. Constant propagation d. Copy propagation	1	4	5	3,4
9	x * 2 can be replaced by x << 1 is an example of? a. Algebraic expression simplification b. Accessing machine instructions c. Strength reduction d. Code Generator	1	2	5	3,4
10	The basic blocks and their link to their successors are depicted in the graph by the name a. Flow graph b. Control graph c. DAG d. Hamiltonian graph	1	2	5	3,4

Part B

Answer any two questions — **(2Q x 4M = 8 Marks)**

11	Explain inherited attribute and S-attribute along with example. Solve the SDT (1*2*3*(4+5)) using given grammar E->E+T/T, T->T*F/F, F-> num	4	2	4	2,4
12	Apply the quadruple, triple and indirect triple intermediate representation techniques and solve these expressions: (i) a= -b+(c*d) (ii) (a+(b*c))*d-e/(f+g)	4	4	4	2,4

13	Evaluate the three address code for following program code:
	(i) main()
	{
	int i;
	int a[10];
	while(i<=10)
	a[i]=0;
	
	(ii) while(a>b)
	{
	If (c<d)
	x=y+z;
	else
	x=y-z;
		4	5	4	2,4

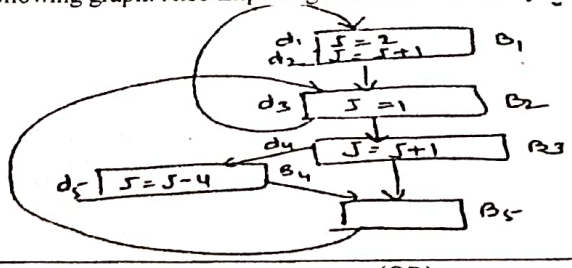
Part C

Answer any two questions — **(2Q x 4M = 8 Marks)**

14	Explain the terms Copy Propagation, Dead-Code Elimination, Code Motion, Reduction in Strength in detailed manner along with example.	4	2	5	3,4
15	Convert three address instructions into DAG: a = a + b, b=a-d, c = b + c d = a– d	4	3	5	3,4
16	Explain Loop optimization and Function preserving transformation in detailed manner.	4	2	5	3,4

Part D

Answer all questions — **(2Q x 12M = 24Marks)**

17	(A) Design Syntax directed Definition for the following grammar. S -> if E then S1| if E then S1 else S2	while E do S. And also write Translation rules for the following grammar switch E begin case V1 : S1 case V2 : S2 . . . case Vn-1 : Sn-1 default : Sn end	12	5	4	2,4
	(OR)				
	(B) Design Backpatching translation scheme for the following and also describe it in detailed manner: E -> E1 or M E2| E1 and M E2| not E1| (E1)| id1 relop id2| true|false, M -> ε	12	5	4	2,4
18	(A) Compute GEN and KILL for each block and also find IN and OUT reaching definites by considering following graph. Also Explain global data flow analysis.  	12	4	5	3,4
	(OR)				

	(B) Construct the flow graph for the following code segment. Also explain terms DAG, Basic Block, Flow graph, Peephole optimization in detailed manner along with example of each.
	fact(n)
	int f=1;
	for(i=2; i≤n; i++)
	f=f*i;
	return f;
		12	5	5	3,4