R-20

Code: 20A562T

III B.Tech. II Semester Regular & Supplementary Examinations May/June 2024

Data Mining and Data Warehousing

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

    2. In Part-A, each question carries **Two marks.**

    3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

1. Answer all the following short answer questions (5 X 2 = 10M)   CO   BL

		CO	BL
a)	Describe about data mining functionalities	CO1	L2
b)	What is data cube?	CO2	L1
c)	List out methods to improve accuracy of classification.	CO3	L1
d)	What is a dendrogram?	CO4	L1
e)	Summarize about spatial data mining	CO5	L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL

UNIT–I

			Marks	CO	BL
2.	a)	Illustrate Data integration process with an example.	6M	CO1	L2
	b)	Explain the Major Issues in Data Mining	6M	CO1	L2

OR

			Marks	CO	BL
3.	a)	What is data cleaning? Describe the approaches to fill missing values.	6M	CO1	L2
	b)	Explain what kind of data can be mined.	6M	CO1	L2

UNIT–II

4. a) A database has four transactions. Let min_sup=60% and min_conf=80%.

TID	Date	items_bought
T100	10/15/99	{K,A,D,B}
T200	10/15/99	{D,A,C,E,B}
T300	10/19/99	{C,A,B,E}
T400	10/22/99	{B,A,D}

			Marks	CO	BL
		Find all frequent item sets using Apriori algorithm.	6M	CO2	L3
	b)	Write the differences between OLTP and OLAP	6M	CO2	L2

OR

5. a) Explain the components in data warehouse architecture models.   6M CO2 L2

    b) Illustrate FP growth algorithm with an example   6M CO2 L3

UNIT–III

6. a) Write about Rule Based classification   6M CO3 L2

    b) Why is tree pruning useful in decision tree induction? What is a drawback of using a separate set of tuples to evaluate pruning?   6M CO3 L2

OR

7. a) What is meant by Bayesian classifier? How Bayes theorem is used for classification.   6M CO3 L2

    b) Discuss how information gain is used in decision tree induction.   6M CO3 L2

UNIT–IV

8. a) Compare k-means with k-medoids algorithms for clustering.   6M CO4 L2

    b) Discuss about key issues in Hierarchical clustering.   6M CO4 L2

OR

9. a) Discuss the similarity measures and distance measures frequently used in clustering the data.   6M CO4 L2

    b) What are the challenges of outlier detection   6M CO4 L2

UNIT–V

10. a) Discuss the principles underlying text clustering.   6M CO5 L2

    b) What are the different types of web mining? How is web usage mining different from web structure mining?   6M CO5 L2

OR

11. Explain in detail about mining complex data types   12M CO5 L2

*** End ***

R-20

Code: 20A563T

III B.Tech. II Semester Regular & Supplementary Examinations May/June 2024

Internet of Things

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
     2. In Part-A, each question carries **Two marks.**
     3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		Marks	CO	BL
1.	Answer *all* the following short answer questions (5 X 2 = 10M)		CO	BL
	a) Describe the needs for Communication APIs in IOT?		CO1	L1
	b) Write the difference between IoT and M2M?		CO2	L3
	c) What is the difference between stub and transit networks?		CO3	L1
	d) Define Functions of Python?		CO4	L1
	e) Explain about Exemplary device?		CO5	L2

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT–I			
2.		Explain about Logical Design of IoT in detail?	12M	CO1	L2
		OR			
3.	a)	Discuss Home Automation Application in IoT?	6M	CO1	L2
	b)	Discuss about IoT Level 1 and level 3 with example?	6M	CO1	L2
		UNIT–II			
4.	a)	Explain about Purpose and Requirement Specification in IoT design methodology?	6M	CO2	L2
	b)	What are the differences between Machines in M2M and Things in IOT?	6M	CO2	L1
		OR			
5.		Describe the following steps involved in IoT system design methodology: (i) Process Specification (ii) Domain model specification.	12M	CO2	L2
		UNIT–III			
6.	a)	Discuss various protocols used in Wireless Personal Area networks?	6M	CO3	L2
	b)	Write short notes on basic 6LOWPAN format. ?	6M	CO3	L3
		OR			
7.	a)	With a neat sketch explain about Wireless RFID Infrastructure?	6M	CO3	L2
	b)	Describe the features of uIPv6?	6M	CO3	L2
		UNIT–IV			
8.	a)	Write short notes on Python Data types?	6M	CO3	L3
	b)	Discuss about File handling in python?	6M	CO3	L3
		OR			
9.		Explain the various Control Flow statements in python and write the difference between Python module and Package?	12M	CO4	L2
		UNIT–V			
10.	a)	Write a snippet for simple LED Blink using Raspberry Pi?	6M	CO5	L2
	b)	Explain in detail about Exemplary device: Raspberry Pi?	6M	CO5	L2
		OR			
11.		Explain about Raspberry Pi board and discuss about the Programming Raspberry Pi with python with an example?	12M	CO5	L2

*** End ***

Code: 20A3062T

III B.Tech. II Semester Regular & Supplementary Examinations May/June 2024

Machine Learning

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
　　　2. In Part-A, each question carries **Two marks.**
　　　3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

1. Answer **all** the following short answer questions　　(5 X 2 = 10M)　　CO　BL

		CO	BL
a)	Define what constitutes a well-posed learning problem in the context of machine learning.	CO1	L1
b)	Identify two common issues encountered in decision tree learning.	CO2	L1
c)	Define the minimum description length principle.	CO3	L1
d)	Discuss two advantages of explanation-based learning (EBL).	CO4	L2
e)	Discuss the concept of generalizing from examples in the context of reinforcement learning.	CO5	L2

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks　CO　BL

UNIT–I

2. a) Describe the Find-S algorithm for finding a maximally specific hypothesis consistent with the training data. Explain the iterative process of Find-S and how it progressively refines the hypothesis space based on observed examples.　　　6M　CO1　L2

　b) Consider a concept learning task where the attribute space consists of three binary attributes: A, B, and C. The training data is as follows:

Example | A | B | C | Target Concept
1　　　 | 0 | 1 | 1 | Positive
2　　　 | 1 | 0 | 0 | Negative
3　　　 | 1 | 1 | 0 | Positive

Apply the Find-S algorithm to find the maximally specific hypothesis.　　　6M　CO1　L3

OR

3. a) Define inductive bias in the context of machine learning and discuss its significance in guiding hypothesis search and generalization. Explore different forms of inductive bias.　　　6M　CO1　L2

b) Discuss the computational complexity of version spaces and candidate elimination and strategies for efficient hypothesis search in large hypothesis spaces. 6M CO1 L2

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UNIT–II

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4. a) Consider a dataset with the following attributes (A, B, C) and target class (Positive or Negative):

Example

	A	B	C	Target
1	0	1	1	Positive
2	1	0	0	Negative
3	1	1	0	Positive

Calculate the information gain for each attribute (A, B, C) based on the target variable. 8M CO2 L3

b) Describe the backpropagation algorithm for training multilayer neural networks. 4M CO2 L2

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OR

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5. Given a feedforward neural network with one input layer (2 neurons), one hidden layer (3 neurons), and one output layer (1 neuron), and the following weights and biases:

Input Layer:
- Neuron 1: w1 = 0.5, w2 = 0.3, b1 = 0.2
- Neuron 2: w3 = 0.1, w4 = 0.4, b2 = -0.1

Hidden Layer:
- Neuron 1: w5 = 0.2, w6 = -0.3, b3 = 0.4
- Neuron 2: w7 = -0.1, w8 = 0.5, b4 = -0.2
- Neuron 3: w9 = 0.3, w10 = -0.2, b5 = 0.1

Output Layer:
- Neuron 1: w11 = 0.3, w12 = -0.1, b6 = 0.5

If the target output for a given input is 0.7, and the actual output of the network is 0.65, calculate the error gradients for each weight and bias using the backpropagation algorithm. 12M CO2 L3

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UNIT–III

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6. a) Compare different models of evolution and learning used in GAs. 6M CO3 L5

b) Explain strategies for parallelizing GAs to improve efficiency and scalability. 6M CO3 L2

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OR

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7. a) Discuss how Bayes' theorem is applied in Bayesian learning to make predictions. 4M CO3 L2

b) In a binary classification problem, the prior probability of the Positive class is 0.4. Given a training dataset with 80 instances, where 45 instances belong to the Positive class and 35 instances belong to the Negative class, calculate the maximum likelihood estimate of the class conditional probabilities P(A=1|Positive) and P(A=1|Negative). | 8M CO3 L3

UNIT–IV

8. a) Discuss the FOIL (First-Order Inductive Learner) algorithm for learning sets of first-order rules. | 6M CO4 L2

b) Compare FOIL with other rule learning algorithms in terms of efficiency and scalability. | 6M CO4 L5

OR

9. a) Explain the concept of sequential covering algorithms and their role in learning sets of rules. | 6M CO4 L2

b) Describe the sequential covering process and how it iteratively refines rule sets to cover different instances in the dataset. | 6M CO4 L2

UNIT–V

10. a) Compare and contrast RL with traditional dynamic programming approaches | 6M CO5 L5

b) Define TD learning and how it combines elements of dynamic programming. | 6M CO5 L3

OR

11. a) Describe the Q-learning algorithm and how it learns the value of state-action pairs. | 6M CO5 L3

b) Explain how Q-learning updates Q-values based on observed rewards and future state-action values. | 6M CO5 L3

*** *End* ***

R-20

Code: 20A33M04

III B.Tech. II Semester Honors Regular Examinations May/June 2024

Natural Language Processing
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		CO	BL
1. Answer *all* the following short answer questions (5 X 2 = 10M)			
a) List the phrase structures of English Syntax		CO1	L1
b) Define parsing.		CO2	L1
c) Define Context Free Grammar.		CO3	L1
d) What is semantic and logical form?		CO4	L1
e) List the possible approaches of machine translation.		CO5	L1

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL

UNIT–I

2.	a)	Explain evaluating language understanding system.	6M	CO1	L2
	b)	Discuss representations and understanding of language systems.	6M	CO1	L2

OR

3.	a)	List the applications of Natural Language Understanding. Explain.	6M	CO1	L1
	b)	Explain Verb Phrases and simple sentences in English syntax.	6M	CO1	L2

UNIT–II

4.	a)	Explain feature systems and augmented grammars.	6M	CO2	L2
	b)	What is Top-Down parser? Explain with example.	6M	CO2	L2

OR

5.	a)	Define Bottom-up parser. Explain with example.	6M	CO2	L2
	b)	Explain augmented transition network with example.	6M	CO2	L2

UNIT–III

6. a) How can you be handling questions in context free grammars? Explain. 6M CO3 L1

   b) Explain Gap Threading. 6M C03 L2

OR

7. Write an algorithm for shift-reduce parsers and draw transition graph and obtain oracle table for the given grammar.

2.1 $S \rightarrow NP\ VP$	2.3 $VP \rightarrow AUX\ V\ NP$
2.2 $NP \rightarrow ART\ N$	2.4 $VP \rightarrow V\ NP$

   12M CO3 L3

UNIT–IV

8. List the types of language models. Explain 12M CO4 L1

OR

9. a) How can you be encoding ambiguity in the logical form? Explain. 6M CO4 L1

   b) Explain verbs and states in logical form. 6M CO4 L2

UNIT–V

10. a) Explain how to build a summarizer. 6M CO5 L2

    b) Discuss MLIR. 6M CO5 L2

OR

11. a) List different approaches to summarization. Explain. 6M CO5 L1

    b) Discuss document preprocessing in detail. 6M CO5 L2

*** End ***

III B.Tech. II Semester Regular & Supplementary Examinations May / June 2024

Cryptography and Network Security
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

1. Answer *all* the following short answer questions (5 X 2 = 10M)	CO	BL
a) Define security attacks.	CO1	L1
b) What is Digital signature?	CO2	L1
c) What is the purpose of X.509 standard?	CO3	L1
d) What do you mean by Security Association? Specify the parameters that identifies the Security Association.	CO4	L1
e) Define Intruders.	CO5	L1

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2.	Explain the OSI security architecture and its relevance in modern network security.	12M	CO1	L2
	OR			
3.	Define attack surfaces and explain how they represent the points of vulnerability in a system or application.	12M	CO1	L1
	UNIT–II			
4. a)	Explain the fundamental principles of symmetric encryption.	6M	CO2	L2
b)	How does symmetric encryption differ from asymmetric encryption, and what are its key advantages and limitations?	6M	CO2	L2
	OR			
5.	In an RSA cryptosystem, a participant uses two prime numbers p = 3 and q = 11 to generate his public and private keys. If the private key is 7, then how will the text AITS be encrypted using the public key?	12M	CO2	L3
	UNIT–III			
6.	Explain Kerberos authentication mechanism with suitable diagram?	12M	CO3	L2
	OR			
7.	Explain the operational description of PGP.	12M	CO3	L2
	UNIT–IV			
8.	Describe the SSL Architecture in detail	12M	CO4	L2
	OR			
9.	Identify and explain the main participants involved in a Secure Electronic Transaction (SET) process.	12M	CO4	L2
	UNIT–V			
10.	Explain any two approaches for intrusion detection.	12M	CO5	L2
	OR			
11. a)	What are the types of firewalls? Explain	7M	CO5	L2
b)	Explain the characteristics of firewall.	5M	CO5	L2

*** End ***

R-20

Code: 20A561T

III B.Tech. II Semester Regular & Supplementary Examinations May / June 2024

Compiler Design
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
      2. In Part-A, each question carries **Two marks.**
      3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

1. Answer *all* the following short answer questions   (5 X 2 = 10M)   CO BL

		CO	BL
a)	Discuss the process of lexical analysis phase.	1	L2
b)	When do we say a grammar is ambiguous?	2	L3
c)	Discuss the purpose of YAAC.	3	L4
d)	Discuss the need of storage allocation for arrays.	4	L2
e)	List down the different forms of code generated by the final phase of the compiler.	5	L3

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks   CO BL

UNIT–I

2.   Divide the following code segment:
float x,y;
/* obtain values x and y from user */
scanf("%d%d",&x,&y);
x = x*y;
printf(" result is %d",x);
/* result printed in console*/
into appropriate lexemes. Which lexemes will get associated lexical values? What are those values?   12M   1 L2

OR

3.   Explain in detail about various phases of a compiler. Explain each phase in detail with suitable example.   12M   1 L2

UNIT–II

4.   Construct LL(1) parsing table for the given grammar and validate the string **aa+bb** using the generated parsing table.
    S A + B   A aA | a   B bB | b   12M   2 L4

OR

5. a) Identify the FIRST and FOLLOW for the following grammar.
    S Aa | abb   A Bb | bba   B Sa | aba   6M   2 L3

   b)   i. Eliminate left recursion for the following grammar
      S Sab | Ab | Ba   A AaB | Bab | ab   B Baa | aba
    ii. Eliminate left factoring from the following grammar.
      S ABCa | ABC | AB   A   aabA | aa
      B bbaB | bba | bb   6M   2 L3

UNIT–III

6. Compare and discuss SLR, CLR and LALR, discuss advantages and disadvantages of each parsing methodology. **12M** 3 L3

OR

7. How operator precedence parse table is constructed for an operator grammar. Also explain operator precedence parsing. **12M** 3 L4

UNIT–IV

8. Generate the Three Address Code for the following code

```
While(v2<v1)
{
V3=v3*v2;
V2=v2+1;
V4=v4*v3;
While(v4<20)
{
If (v3>30) { break; }
V2=v2*v4;
}
V1=v1+1;
}
```
12M 4 L2

OR

9. a) Discuss block structure and non-block structure storage allocation. **6M** 4 L2

   b) Discuss the need of symbol table manager.
   Provide a brief note on the construction of symbol table. **6M** 4 L2

UNIT–V

10. a) Explain different principal source of optimization technique with suitable example **6M** 5 L2

    b) Explain Peephole optimization techniques with suitable example **6M** 5 L2

OR

11. Consider the following program for matrix multiplication

```
for(i=0;i<10;i++)
  for(j=0;j<10;j++)
    c[i][j]=0;
for(i=0;i<10;i++)
  for(j=0;j<10;j++)
    for(k=0;k<10;k++)
      c[i][j]=c[i][j]+a[i][k]*b[k][j];
```
convert the given coding into a suitable form and perform the following

 i. What are the basic blocks of the code?

 ii. Construct a flow graph.

 iii. Identify the loops in the flow graph. **12M** 5 L3

*** End ***