DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE – RAIGAD -402 103
Semester Winter Examination – December - 2019

Branch: Computer Science and Engineering **Sem.:- 5th**
Subject with Subject Code:-Database Systems BTCOC501 **Marks: 60**
Date:-09/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc. wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

			Marks
Q. 1	a)	Explain the difference between two-tier and three-tier architectures. Which is better suited for Web applications? Why?	(6)
	b)	Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars, and has one or more premium payments associated with it. Each payment is for a particular period of time, and has an associated due date, and the date when the payment was received.	(6)
Q. 2	a)	Let the following relation schemas be given $R = (A, B, C)$, $S = (A, D, E)$ Let relations r (R) and s (S) be given. Give an expression in SQL that is equivalent to each of the following queries. (1) $\prod_{A,E}(\sigma_{C=D}(r \times s))$ (2) $r \bowtie s$ (3) $\prod_{A}(r) \cap \prod_{A}(s)$	(6)
	b)	Consider the following database Student(name, s_no, class, major) Course(c-name, c_no, credit_hours, department) Write SQL statements to do the following update on the database schema (1) Insert a new student,<'Johnson',25,1,'Math'>,in the database. (2) Change the credit_hours of course 'Data Science' to 4.	(6)

(3) Delete the record for the student whose name is 'Smith' and whose student number is 17.

Q. 3 a) Compute the closure of the following set F of functional dependencies for relation schema (6)

r (A, B, C, D, E).

A→BC

CD→E

B→D

E→A

List the candidate keys for R.

b) Illustrating the concept of fully functional dependency, explain 2NF with example. (6)

Q. 4 a) Let relations r1(A, B,C) and r2(C, D, E) have the following properties : r1 has 20,000 tuples, r2 has 45,000 tuples, 25 tuples of r1 fit on one block, and 30 tuples of r2 fit on one block. (6)
Estimate the number of block transfers and seeks required, using each of the following join strategies for r1⋈ r2: (r1 Natural Join r2)

1. Nested-loop join.
2. Block nested-loop join.

b) Explain Query processing? Explain various steps in query processing with the help of neat sketch. (6)

Q. 5 a) Construct a B+-tree for the following set of key values: (6)
(2, 3, 5, 7, 11, 17, 19, 23, 29, 31)
Assume that the tree is initially empty and values are added in ascending order. Construct
B+ tree for the cases where the number of pointers that will fit in one node is as follows:
i. Four ii. Six

b) Define ordered indices. Differentiate between Dense and sparse indices with suitable example. (6)

Q. 6 Write short note on following : (12)
(1) ACID properties of transaction
(2) View serializable schedule

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE – RAIGAD -402 103
Semester Winter Examination – December - 2019

Branch: B.Tech Computer Science **Sem.:- V**
Subject:- Theory of Computation (BTCOC502) **Marks: 60**
Date:- 11/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

Q.1. a) What is FA(Finite Automaton)? Explain with example. Elaborate on 'Automaton and complexity'. **(06)**

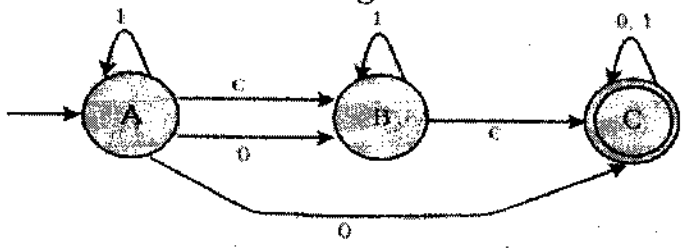
Q1. b) Convert following regular expression to their equivalent FA. **(06)**

i) ba*b
ii) (a+b) c
iii) a (bc)

Q.2. a) Let G be the grammar :
i. S→ 0B | 1A
ii. A→ 0 | 0S | 1AA
iii. B→ 1| 1S | 0BB
For the string 00110101and 11001010 find:
1) Left most derivation
2)Right most derivation **(06)**

Q.2. b) Explain Pumping Lemma and its applications. **(06)**

Q.3. a) Construct DFA for following NFA



(06)

Q.3. b) Discuss the Chomsky Hierarchy of languages by taking suitable example of each classification. (06)

Q.4 a) Convert the given Grammar into Chomsky Normal Form (CNF)

$S \rightarrow ASB$

$A \rightarrow aAS \mid a \mid \varepsilon$

$B \rightarrow SbS \mid A \mid bb$ **(06)**

Q.4. b) Explain:

1) Recursively Enumerable Language

2) Greibach Normal Form (06)

Q.5. a) Explain Turing Machine in details along with halting problem. Also state its applications. (06)

Q.5. b) Construct a PDA for language $L = \{ wcw^R \mid w = \{0, 1\}^* \}$ where w^R is the reverse of w. (06)

Q.6. a) Explain Random access Turing Machines and Non deterministic Turing Machines. (06)

Q.6. b) Define Mealy machine and Moore machine and Convert following Mealy machine into Moore machine.

State	Input	
	a	b
Q_0	$Q_{2,1}$	$Q_{3,0}$
Q_1	$Q_{0,0}$	$Q_{1,1}$
Q_2	$Q_{1,1}$	$Q_{2,0}$
Q_3	$Q_{2,0}$	$Q_{0,1}$

(06)

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – December - 2019

Branch: B. Tech.(COMPUTER ENGINEERING) **Sem.:- V**
Subject with Subject Code:- MACHINE LEARNING (BTCOC503) **Marks: 60**
Date:- 13/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. a) Define Machine Learning and Enlist Applications of Machine Learning (4)
b) Differentiate between Supervised and Unsupervised Learning (4)
c) List the issues in basic ID3 Decision Tree Algorithm. (4)
Interpret the algorithm with respect to overfitting the data

Q.2. a) Classify Fruit={Yellow, Sweet, Long} using Bayes learning , Data as given in table (6)

Fruit	Yellow	Sweet	Long	Total
Orange	350	450	0	650
Banana	400	300	350	400
Other	50	100	50	150

OR

a) Predict the class of new data point x=1 and y=1 using K-NN algorithm assume k=3 (6)

x	y	class
-1	1	-
0	1	+
0	2	-
1	-1	-
1	0	+
1	2	+
2	2	-
2	3	+

b) Discuss Maximum Likelihood and Least Square Error Hypothesis. (6)

Q.3. a) How does SVM works? (6)
b) What is logistic regression? Differentiate between Linear and Logistic Regression (6)

Q.4. a) Explain the concept of a Perceptron with a neat diagram (4)
b) What is back propagation? (4)
c) Explain how to learn Multilayer Networks (4)

Q.5. a) What is PAC learning model?
Explain the sample complexity for Finite hypothesis spaces (6)
b) Define and explain "Shattering a set of Instances" with suitable example. (6)

Q.6. a) What is Hierarchical Clustering? Consider following distance matrix and apply hierarchical clustering to cluster the objects u,v,w,x,y (6)

	u	v	w	x	y
u	0	1	2	2	3
v	1	0	2	4	3
w	2	2	0	1	5
x	2	4	1	0	3
y	3	3	5	3	0

b) Given that the Observations are already clustered in two clusters C1 and C2 as shown in table (6)

Cluster C1			Cluster C2		
Obs.	X1	X2	Obs.	X1	X2
A	2	4	C	9	3
B	8	2	E	8.5	1
D	1	5			

Apply K-Mean clustering algorithm to find and Plot initial and final distribution of observations in C1 and C2

Paper End

Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY
LONERE – RAIGAD - 402 103
Winter Semester Examination, December - 2019

Branch: B.Tech. In Computer Engineering | **Semester: V**
Subject with Subject Code: Cyber Law (BTCOE504B) | **Marks: 60**
Date:-16/12/2019 | **Time: 3 Hr.**

Instructions to the Students:
1. Each question carries 12 marks.
2. Attempt **any FIVE** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

(Marks)

Que. 1 Attempt the following questions. **[12]**

A) (i) Define E-commerce and describe various players in E-commerce.
(ii) Explain problems of Internet jurisdiction and suggest possible solutions.

B) (i) Describe basic laws of digital and electronic signature in India.
(ii) Explain operating mechanism of Internet.

Que. 2 Attempt any TWO of the following questions. **[12]**

A) Explain relevance of domain names in intellectual property rights.

B) (i) Explain rules of confidential information. Also describe how confidential information get accessed using various ways.
(ii) Explain the process of verifying electronic records in India.

C) Explain central government's power to make rule in India.

Que. 3 Attempt the following questions. **[12]**

A) (i) Explain the various measures could be taken at national level for offenses against confidentiality, integrity and computer data system.
(ii) Write in detail domestic measures taken against offenses related to child pornography.

B) (i) Write in detail the functions of ICANN.
(ii) Differentiate between World Trade Organization and World Intellectual Property Rights?

Que. 4 Attempt Any Two of the Following **[12]**

A) What are the functions of cyber Appellate tribunal?

B) Explain in detail Indian evidence act 1872.

C) Under what circumstances one can is eligible to appeal in high court under IT act.

Que. 5 Attempt the following questions. **[12]**

A) Explain the powers of central government and state government to make rules under IT act.

B) Explain in detail sensitive information rule 2011.

Que. 6 Solve the following. **[12]**

A) What are the security threats to cyber space? Define and explain electronic signature and copyright.

B) What do you mean by cyber crime? Who appoint controller of appellate tribunal in India and explain his functions.

----------Paper End----------

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – Dec - 2019

Branch: Computer Engineering **Sem.:- 5TH**
Subject: - Business Communication, BTCOE505B **Marks: 60**
Date: 18/12/2019 **Time: - 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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(Marks)

Q.1. Solve any two of the following questions. **(12)**

a) What is Business Communication? Discuss its main features.
b) Define Communicative Competence and explain its various aspects.
c) Explain the main objectives of Business Communication.

Q.2. Solve any two of the following questions. **(12)**

a) How to solve the problem of translation?
b) Explain the factors which affect thought and speech.
c) What is Inter Cultural Communication? How to manage it?

Q.3.a) Discuss the barriers in communication. **(12)**
b) Explain the various communication rules in detail.

Q.4. a) How to become an effective Interpersonal Communicator? **(12)**
b) Discuss the importance of Organizational Communication.

Q.5. Solve any two of the following questions. **(12)**

a) What is Collaboration? Explain the elements of Collaboration.
b) Explain the effective Persuasive Communication.
c) Discuss the importance of Team Communication.

Q.6.a) Discuss the Ethics in Business Communication. **(12)**
b) Why is Business Communication important for leaders and managers?

PAPER END