

St. Thomas' College of Engineering & Technology

B. Tech. 6th Semester, 1st Internal Examination, March 2022

Database Management Systems (PCC CS 601)

Full Marks : 50

Time : 1 ½ Hour.

Group - A

Choose the correct option(s) from the list of options provided with each part of the following question.

(1X5=5)

1. i) An example of a TCL command is
 - a) INSERT
 - b) SAVEPOINT
 - c) DROP
 - d) GRANT
- ii) The narrowest view of the database is provided by the data abstraction at the
 - a) physical level
 - b) logical level
 - c) view level
 - d) none of the above
- iii) Naïve users interact with the database by invoking programs written by Application Programmers – the statement is
 - a) TRUE
 - b) FALSE
 - c) Can't say
- iv) Input to the Query Evaluation Engine is the output generated by
 - a) DDL Interpreter
 - b) DML Compiler
 - c) Transaction Manager
 - d) Data Dictionary
- v) A concept of abstraction treating relationship set as higher level entities is called
 - a) specialization
 - b) generalization
 - c) attribute inheritance
 - d) aggregation

Group - B

Attempt any THREE from the questions given below.

5X3=15

2. Discuss database Models.
3. Explain in detail the Two – Tier & Three – Tier architecture of DBMS.
4. Explain with example the different types of keys.

Attempt any TWO from the following.

2x15=30

5) Consider the following tables (fields given in brackets) and answer the questions that follow:

- i) Employee (EmpID, EmpName, BirthDate, Salary, DeptNo)
- ii) Department (DeptID, DeptName, Location)
- iii) Dependent (DepID, Name, BirthDate, EmpID)

- a) Identify the primary keys and foreign keys in the above tables. 3
- b) Write SQL for the following: 6 x 2
 - i) Select all pairs of employees who work in same department along with the names of the corresponding departments.
 - ii) Select names and IDs of employees who have no dependent.
 - iii) Select names and EmpID of employees who work in Kolkata and have a salary less than 7000.
 - iv) Select department wise maximum salary paid to an employee.
 - v) Select names and date of birth of employees who are born before 1970 but do not work in Kolkata.
 - vi) Select those employees whose salary is greater than their department's average salary.

6) Consider the insurance database given below:

(5X3=15)

person(driver-id#, name, address)

car(license, model, year)

accident(report-number, date, location)

owns(driver-id#, license)

participated(driver-id#, car, report-number, damage-amount)

where primary keys are underlined. Construct the following SQL queries for this relational database:

- i) Find the total number of people who owned cars that were involved in accidents in the year 1989.
- ii) Find the number of accidents in which the cars belonging to "Richard Barker" were involved.
- iii) Add a new accident to the database; assume any values for required attributes.
- iv) Delete the BMW belonging to "Richard Barker".
- v) Update the damage amount for the car with license number "IARB5909" in the accident with report number "RC3528" to \$3500.

Question No.	Q1	Q2	Q3	Q4	Q5a	Q5b	Q6
Course Outcome	C311.1	C311.1	C311.1	C311.3	C311.2	C311.1	C311.1
Bloom's Level (in fig)	1	2	2	2	4	4	4

Signature
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St. Thomas' College of Engineering & Technology

B. Tech. 6th Semester, 1st Internal Examination, March 2022

Data Warehousing and Data Mining [PEC-IT602B]

Full Marks : 50

Time : 1 1/2 Hour.

Group A

5 X 1

1. Multiple choice type questions
 - i) Which of the following refers to the problem of finding abstracted patterns (or structures) in the unlabeled data?
 - a) Supervised learning b) Unsupervised learning c) Hybrid learning d) Reinforcement learning
 - ii) Which of the following is an essential process in which the intelligent methods are applied to extract data patterns?
 - a) Warehousing b) Data Mining c) Text Mining d) Data Selection
 - iii) What is KDD in data mining?
 - a) Knowledge Discovery Database b) Knowledge Discovery Data c) Knowledge Data definition d) Knowledge data house
 - iv) What are the functions of Data Mining?
 - a) Association and correctional analysis classification b) Prediction and characterization c) Cluster analysis and Evolution analysis d) All of the above
 - v) Which of the following statement is true about the classification?
 - a) It is a measure of accuracy b) It is a subdivision of a set c) It is the task of assigning a classification d) None of the above

Group B

3 X 5

2. What is Information Gain, Gain ratio, Gini index? 2+2+1
3. Explain the Algorithm for Decision Tree Induction 5
4. Describe entropy and conditional entropy.

Group C

2 X 15

5. Define Decision tree. What are the advantage and disadvantage of Decision tree over the other approach for data mining? Discuss briefly the tree construction principle. 2+4+5+4
6. a) What is the use of regression? What may be the reason for not using the linear regression model to estimate the output data?
- b) What is time series data? How it is used in data mining? (2+3) + (2+2) + 6
- c) Explain the Bayesian classification.

OUTCOME BASED EDUCATION (OBE)						
CO mapping With Bloom's Level						
Question No.	Q1	Q2	Q3	Q4	Q5	Q6
Course Outcome	1	4	4	3	4	4, 5
Bloom's Level (in fig)	1	2	4	2	5	5

Bloom's Level: Remember = 1, Understand = 2, Apply = 3, Analyze = 4, Evaluate = 5, Create = 6

St. Thomas' College of Engineering & Technology

B. Tech. 6th Semester, 1st Internal Examination, March 2022

Computer Networks [PCC-CS602]

Full Marks: 50

Time: 1½ Hour.

Group - A

Choose the correct option(s) from the list of options provided with each part of the following question.

1. i) The frequency of failure and network recovery time after a failure are measures of the _____ of a network. (1×5=5)
- a) performance
 - b) reliability
 - c) security
 - d) feasibility
- ii) Which topology requires a multipoint connection ?
- a) Mesh
 - b) Star
 - c) Bus
 - d) Ring
- iii) Which error detection method consists of a parity bit for each data unit as well as an entire data unit of parity bits ?
- a) Simple parity check
 - b) Two dimensional parity check
 - c) CRC
 - d) Checksum
- iv) In CRC if the data unit is 111111 and the divisor 1010 what is the dividend at the transmitter ?
- a) 111111000
 - b) 1111110000
 - c) 111111100
 - d) 111111010
- v) Flow control is needed to prevent _____.
- a) bit errors
 - b) overflow of the sender buffer
 - c) overflow of the receiver buffer
 - d) collision between sender and receiver

Group - B

Answer all questions.

2. Discuss the basic topologies of computer networks. (5)
3. a) How can you connect a PC to a computer network ?
b) How does data link layer help a computer to communicate in a computer network ?
c) Why the internet is also called as the TCP/IP internet ?
d) What do you mean by an ISP ?
e) How will you identify a computer in the internet ? (1×5)

4. a) Differentiate between LAN, MAN, & WAN.
 b) An organization is granted the block 130.34.12.64/26. The organization needs to have four subnets. What are the subnet addresses and the range of addresses for each subnet? (2+3)

Group - C

Answer all questions.

5. a) An ISP is granted the block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to customers as follows:
 i. The first group has 200 medium size businesses, each needs 128 addresses.
 ii. The second group has 400 small businesses, each needs 16 addresses.
 iii. The third group has 2048 households, each needs 4 addresses.
 Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations. (8+7=15)
 b) Discuss in detail the OSI reference model for networking with a proper diagram. (5×3=15)
6. Write short notes on *any THREE* given below.
 a) CRC
 b) Loopback & Limited Broadcast Addresses
 c) Starting & ending Flags with Bit Stuffing
 d) Transmission Impairments
 e) Twisted Pair Cables

OUTCOME BASED EDUCATION (OBE)									
CO mapping With Bloom's Level									
Question No.	Q1	Q2	Q3	Q4a	Q4b	Q5	Q6	Q7a-c	Q7d-e
Course Outcome	1	1	1	1	3	3	3	3	2
Bloom's Level (in fig)	1	3	5	4	6	5	5	2	2

Bloom's Level: Remember = 1, Understand = 2, Apply = 3, Analyze = 4, Evaluate = 5, Create = 6

St. Thomas' College of Engineering & Technology

B. Tech. 6th Semester, 1st Internal Examination, March 2022

Distributed System (PEC-IT601B)

Full Marks : 50

Time : 1 ½ Hour.

GROUP-A

1X5=5

1. Multiple Choice Question

- i) A transaction management is
 - a. Maintains a log of transactions
 - b. Maintains before and after database content
 - c. Maintains appropriate concurrency control
 - d. All
- ii) A heterogeneous distributed database is said to have which of the following.
 - a. The same DBMS is used at each location and data are not distributed across all nodes.
 - b. The same DBMS is used at each location and data are distributed across all nodes.
 - c. A different DBMS is used at each location and data are not distributed across all nodes.
 - d. A different DBMS is used at each location and data are distributed across all nodes.
- iii) An instruction in process....
 - a. May be or may not be atomic.
 - b. Must be atomic.
 - c. May be partially executed.
 - d. None.
- iv) A distributed database is
 - a. A single logical database that is spread to multiple locations and is interconnected by a network
 - b. A loose collection of file that is spread to multiple locations and is interconnected by a network
 - c. A single logical database that is limited to one location.
 - d. None.
- v) Which of the following is the disadvantage of replication?
 - a. Reduced network traffic
 - b. If the database fails at one site, a copy can be located at another site.
 - c. Each site must have the same storage capacity.
 - d. None of these

GROUP-B

5X3=15

1. Draw and describe the different architecture of distributed database.
2. Describe transparency and its types.
3. Differentiate homogenous and heterogeneous distributed database.

GROUP-C

1. a. Define Distributed database with example. What are the advantages of distributed database of centralized database?
b. Describe the features of distributed database.
c. Describe transaction in DBMS. Explain the ACID property of a transaction.
5+5+5=15
2. a. Describe the objective of distributed database.
b. Explain different types of fragmentation in DDB with example.
c. Explain serializability in transaction. "Serial schedule is always consistent"....justify the statement.
5+5+5=15

		GR-C	
GR-A	GR-B	Q1	Q2
Q1-Q5	Q1-Q5	CO3,CO2,	CO1,CO2,CO3
CO1,CO2,CO3,CO4,CO5	CO1,CO2,CO3	Analyze, understand	Remember, analyze
Remember, Analyze	Understand, remember		

St. Thomas' College of Engineering & Technology

B. Tech. 6th Semester, 1st Internal Examination, March 2022

Image Processing (PEC-IT601D)

Full Marks : 50

Time : 1 1/2 Hour.

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Group A

1. Choose the correct alternatives for the following:

1x5=5

- i) A digital image is composed of a finite number of elements, each of which has a particular location and value. These elements are called
 - a) dot b) pixel c) Point d) none of these
- ii) The total amount of energy that flows from the light source and it is usually measured in watts (W) is called
 - a) Radiance b) Luminance c) Reflectance d) none of these
- iii) Digitizing the intensity values of an image is called
 - a) Quantization b) Sampling c) Segmentation d) Compression
- iv) The transform which possesses the 'multi-resolution' property is
 - a) Fourier transform b) Hough transform c) Cosine transforms d) Wavelet transform
- v) An image of 1024×1024 pixels, in which the gray scale is $[0, 255]$. How much storage space is required if the image is not compressed?
 - a) $1024 \times 1024 \times 256$ bits b) $1024 \times 1024 \times 255$ bits c) $1024 \times 1024 \times 8$ bits d) None of these.

Group B

(Short answer type questions)

2. Calculate the output image after using the median filter of the given 4×3 image?

[5]

6	56	12
100	23	10
12	6	34
90	23	12

3. What are the differences between uniform and non-uniform sampling and quantization?

[5]

4. A gray scale image is 1200 pixels wide and 1200 pixels high. The image was scanned at 300 dpi. What is the physical size of the image? Also, calculate the same for color image. [3+2]

Group C

(Long answer type questions)

5. a) Explain neighbors of a pixel. Discuss 4-adjacency, 8-adjacency and m-adjacency in this context.
- b) Consider the image segment shown below.
- i) Let $V = \{0, 1\}$ and compute the D_4 , D_8 , and D_m distances between p and q.
- ii) Repeat for $V = \{1, 2\}$

3	1	2	1(q)	
2	2	0	2	
1	2	1	1	
(p)	1	0	1	2

$[(3+4)+(4+4)]$

6. a) How does single derivative and double derivative perform as sharpening spatial filter? Compare their performances. For the one-dimensional image shown in given below, compute the single and double derivative. Comment on both the image and its single and double derivative.

5	5	4	3	2	1	0	0	0	6	0	0	0	0	1	3	1	0	0	0	7	7	7
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$[3+4+6+2=15]$

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St. Thomas' College of Engineering & Technology
B. Tech. 6th Semester, 1st Internal Examination, March 2022
Human Resource Development and Organizational Behavior (OEC-IT601 B)
Full Marks : 50

Time : 1 ½ Hrs.



SECTION - A
(Attempt all the questions)

(5x1)

1. Identify the behavioral science contributing to group dynamics
 - a. Psychology
 - b. Sociology
 - c. Social Psychology
 - d. Anthropology
2. An employee is always at work before everyone and leaves after everyone. He may be considered as productive and hard-working. This judgement is based on which of the following interpretation biases?
 - a. Projection
 - b. Halo Effect
 - c. Stereotyping
 - d. Contrast Effect
3. _____ will be the major issue arising while managing a diverse workforce
 - a. Favoritism
 - b. Pragmatism
 - c. Poor time management
 - d. Lack of morale
4. In this decision-making technique the replies of all the members to the questionnaires are summarized and feedback to them is sent for review. Which technique are we referring here?
 - a. Delphi
 - b. Consensus
 - c. Devil's Advocate
 - d. Brainstorming
5. A situation, wherein a perceiver tends to see in others the traits he himself possesses, is called _____.
 - a. Repetition
 - b. Contrast
 - c. Rejection
 - d. Projection

SECTION B
(Answer any 3 questions)

(3x5)

2. McDonald's examines its employees as the primary source of progress in the field of quality and productivity. This organisation has based its success on the motivation theories having altered only some aspects of them. The 'McDonalds' company applies three components of the motivation system: **financial encouragement, non-financial encouragement, and social policy**. Identify which motivation theory does McDonald's use and give reasons for your choice.

3. Differentiate psychology, sociology and social psychology with necessary examples.

4. List the factors influencing the behavior of an individual in an organization and explain any one with example.

5. What are the disadvantages of brainstorming session.

SECTION C
(Answer any 2 questions)

(15x2)

6. Explain Theory X and Y and give its relation to that of Maslow's need theory.

7. Compare the definitions, symptoms and implications of four different types of attitudes with suitable examples.

8. What are the factors that affect our perception? Relate it with suitable examples.

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Understand	Understand	Analyze	Understand	Understand	Knowledge	Analyze	Apply
CO2	CO3	CO4	CO3	CO2	CO1	CO4	CO5