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M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Information Technology

DATABASE SYSTEMS

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. A collection of tables to represent both data and the relationships among data, is known as   (CO1, K2)

    (a) Entity Relationship model

    (b) Relational model

    (c) Object based data model

    (d) Semi–structure data model

2. The preface that converts the DML statements to normal procedure calls in the host language is known as _____   (CO1, K2)

    (a) DML Pre-executor (b) DML executor

    (c) DML compile   (d) DML–Precompile

3. The mathematical terms relations and tuples are referred to as?   (CO2, K3)

    (a) Table and Domain (b) Table and key

    (c) Table and row   (d) Table and column

4. Which of the following describe the logical design of the database? (CO2, K4)

(a) Database instance (b) Database Schema

(c) Relation schema (d) Relation Instance

5. Every weak entity set call be convened to a strong entity set by (CO3, K4)

(a) Using generalization

(b) Simply adding appropriate attribute

(c) Using aggregation

(d) Repeating the entity set several times

6. An _____ is a set of entities of the same type that share the same properties or attributes. (CO4, K2)

(a) Entity set (b) Attribute set

(c) Relation set (d) Entity model

7. a subquery that uses a correlation name from an outer query is called a (CO4, K5)

(a) derived subquery (b) induced subquery

(c) deduced subquery (d) correlated subquery

8. Which option in view is to ensure that all UPDATE and INSERTS satisfy the condition(s) in the view definition? (CO5, K5)

(a) Uncheck (b) With Check

(c) Check (d) With

9. Which of the following statement is not correct for serializability of transactions? (CO5, K6)

(a) In a serial schedule, each transaction is independent of others

(b) In non–serial schedule, we allow the two transactions to overlap their execution

(c) A non–serial schedule may not always result in an incorrect outcome

(d) Every schedule is serializable

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10. If a transaction has obtained a _____ lock, it can read but cannot write on the item (CO5, K5)

    (a) Shared mode   (b) Exclusive mode

    (c) Read only mode   (d) Write only mode

Part B   (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) What is data independence? Explain the difference between physical and logical data independence with example. (CO1, K2)

Or

    (b) What is mapping cardinalities? Explain it with real-time examples. (CO1, K2)

12. (a) What are the Disadvantages of Distributed Systems? (CO2, K3)

Or

    (b) Explain the Decision support system. (CO2, K3)

13. (a) Explain Multimedia Database Applications (CO3, K4)

Or

    (b) Explain about packing relations. (CO3, K2)

14. (a) Explain the characteristics of spatial databases. (CO4, K4)

Or

    (b) Express the spatial data model. (CO4, K5)

15. (a) Explore the concept of intermittently synchronized databases. (CO5, K6)

Or

    (b) How do these storage technologies impact database performance and reliability? (CO5, K6)

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Part C $(5 \times 8 = 40)$

Answer **all** the questions not more than 1000 words each.

16. (a) Explain the database system's 3-tier architecture with a diagram in detail.   (CO1, K2)

Or

(b) Discuss in detail about relational data model.   (CO1, K4)

17. (a) Explain OLAP in detail.   (CO2, K2)

Or

(b) Explain object-oriented DBMS in detail.   (CO2, K2)

18. (a) Define multimedia querying and explain. (CO3, K2)

Or

(b) What is an integrity constraint? Explain its types with examples.   (CO3, K3)

19. (a) Classify the Types of Spatial Queries in DBMS with examples.   (CO4, K4)

Or

(b) Explain the features of spatial Databases in detail.   (CO4, K5)

20. (a) Explain the characteristics of mobile computing.   (CO5, K5)

Or

(b) Explain the architecture of a web-based DBMS.   (CO5, K6)

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		546202

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Information Technology

DATA MINING

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. What is the purpose of data preprocessing in data mining? (CO1, K2)

    (a) To transform raw data into a suitable format for analysis

    (b) To summarize data in a compact form

    (c) To generate new data from existing data

    (d) To visualize data for easier analysis

2. Which of the following is a dimensionality reduction technique? (CO1, K2)

    (a) Apriori algorithm

    (b) K-means clustering

    (c) Principal component analysis

    (d) Linear regression

3. OLAP based on?   (CO2, K3)

    (a) one dimensional data model

    (b) two dimensional data model

    (c) multidimensional data model

    (d) all of the above

4. What does OLTP stand for?   (CO2, K2)

    (a) Offline transaction processing

    (b) Online transaction processing

    (c) Outline traffic processing

    (d) Offline transport processing

5. Which algorithm is used for frequent itemset mining?

                                                      (CO3, K3)

    (a) Decision tree algorithm

    (b) K-nearest neighbors algorithm

    (c) Apriori algorithm

    (d) Naive Bayes algorithm

6. Which of the following is a lazy learner?   (CO3, K3)

    (a) K-nearest neighbor

    (b) Linear regression

    (c) Support Vector Machine

    (d) Artificial Neural Network

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7. Which of the following is the collection of data objects that are similar to one another within the same group?
(CO4, K4)

(a) Partitioning

(b) Grid

(c) Cluster

(d) Table

8. What are the two main types of hierarchical clustering?
(CO4, K2)

(a) K-means and K-medoids

(b) Agglomerative and divisive

(c) Density-based and grid-based

(d) Model-based and graph-based

9. Interpolation is made possible by a principle called
(CO5, K5)

(a) Spatial Autocorrelation

(b) Spatial auto-correction

(c) Thematic Autocorrelation

(d) Thematic auto-correction

10. For a very large corpus, that the length of the vector might be thousands or millions of positions and each document may contain very few of the known words in the vocabulary then this results in a vector with lots of zero scores called as —————— (CO5, K6)

(a) Null vector

(b) Zero vector

(c) Sparse Vector

(d) Categorical features

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Answer **all** the questions not more than 500 words each.

11. (a) Write about Dimensionality reduction methods.
(CO1, K2)

Or

(b) Why do we preprocess the data? Discuss. (CO1, K3)

12. (a) Write in brief about schemas in multidimensional data model. (CO2, K4)

Or

(b) What are the steps in designing the data warehouse? Explain. (CO2, K3)

13. (a) How to improve the accuracy of classification? Explain. (CO3, K5)

Or

(b) What is Bayes theorem? Explain. (CO3, K2)

14. (a) What are the features of cluster analysis? (CO4, K3)

Or

(b) What is outlier detection? Explain distance-based outlier detection. (CO4, K4)

15. (a) Explain the contribution of spatial data mining in academic activities. (CO5, K6)

Or

(b) Explain the challenges of mining used in WWW.
(CO5, K5)

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Part C $(5 \times 8 = 40)$

Answer **all** the questions not more than 1000 words each.

16. (a) What is Data reduction? Discuss in detail.

(CO1, K2)

Or

(b) Write about Dimensionality reduction methods.

(CO1, K4)

17. (a) Explain the Three-tier data warehouse architecture with a neat diagram. (CO2, K3)

Or

(b) Discuss the following : (CO2, K4)

   (i)   Star schema (2)

   (ii) Snow Flake schema (2)

   (iii) Fact constellation schema. (4)

18. (a) How decision trees are used for classification? Explain the decision tree induction algorithm for classification. (CO3, K5)

Or

(b) What are the various Constraints in Constraint-based Association rule mining? Explain. (CO4, K2)

19. (a) Explain K means clustering method and algorithm.

(CO4, K4)

Or

(b) How density-based methods are used for clustering? Explain. (CO4, K6)

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20. (a) Write a short note on the following : (CO5, K3)

    (i) Text mining

    (ii) Temporal data mining.

Or

(b) Explain the multimedia data mining architecture.

(CO5, K2)

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M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Information Technology

DIGITAL IMAGE PROCESSING

(CBCS – 2022 onwards)

Time : 3 Hours　　　　　　　　　Maximum : 75 Marks

Section A　　　　　(10 × 1 = 10)

Answer **all** the following objective questions by choosing
the correct option.

1.　What is the quantity that is used to measure the total amount of energy flowing from the light source? (CO1, K1)

　　(a)　Brightness　　　　(b)　Intensity

　　(c)　Luminance　　　　(d)　Radiance

2.　A continuous image is digitized at ——————points. (CO1, K2)

　　(a)　random　　　　　(b)　vertex

　　(c)　contour　　　　　(d)　sampling

3.　What is the maximum area of the cluster that can be eliminated by using an $n \times n$ median filter? (CO2, K2)

　　(a)　n^2　　　　　　(b)　$\dfrac{n^2}{2}$

　　(c)　$2*n^2$　　　　　(d)　n

4. ——————— enhance Image Differentiation.   (CO2, K3)

   (a) Pixel Density

   (b) Contours

   (c) Edges

   (d) None of the mentioned

5. What is the basis for numerous spatial domain processing techniques?   (CO3, K1)

   (a) Transformations

   (b) Scaling

   (c) Histogram

   (d) None of the Mentioned

6. A spatial averaging filter having all the coefficients equal is termed ———————.   (CO4, K3)

   (a) A box filter

   (b) A weighted average filter

   (c) A standard average filter

   (d) A median filter

7. The function of filters in Image sharpening in frequency domain is to perform reverse operation of which of the following Lowpass filter?   (CO3, K4)

   (a) Gaussian Lowpass filter

   (b) Butterworth Lowpass filter

   (c) Ideal Lowpass filter

   (d) None of the Mentioned

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8. Which is not a type of mean filter? (CO4, K2)

   (a) Harmonic mean filter

   (b) Arithmetic mean filter

   (c) Geometrical mean filter

   (d) Sequence mean filter

9. Images usually gets corrupted during (CO5, K4)

   (a) Restoration

   (b) Acquisition

   (c) Transmission

   (d) Degradation

10. Information per source is called (CO5, K1)

    (a) sampling

    (b) quantization

    (c) entropy

    (d) normalization

Section B $(5 \times 5 = 25)$

Answer **all** the questions not more than 500 words each.

11. (a) Describe in detail about psychovisual model.

    (CO1, K2)

    Or

    (b) Discuss in detail about image sensing and acquisition devices. (CO1, K4)

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12. (a) Explain about intensity transformations and spatial filtering. (CO2, K2)

Or

(b) Explain fourier transformation and its properties. (CO2, K3)

13. (a) Discuss the density slicing with an example. (CO3, K2)

Or

(b) Explain histogram modification and specification with a suitable example. (CO3, K5)

14. (a) Explain the linear, position-invariant degradations with examples. (CO4, K6)

Or

(b) Illustrate restoration in the presence of noise only using spatial filtering. (CO4, K6)

15. (a) Explain the wavelet coding with an example. (CO5, K2)

Or

(b) Explain the LZW coding with a suitable example. (CO5, K3)

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Section C $(5 \times 8 = 40)$

Answer **all** the questions not more than 1000 words each.

16. (a) Explain the basic relationships between pixels in a digital image. (CO1, K1)

Or

(b) Discuss about digital image representation and resolution of a digital image. (CO1, K2)

17. (a) Explain about sharpening spatial filters. (CO2, K4)

Or

(b) Compare the various image transformation techniques. (CO2, K5)

18. (a) Discuss the following spatial enhancement techniques :

(i) Spatial averaging

(ii) Median Filter. (CO3, K2)

Or

(b) Explain point operation in detail with a neat diagram. (CO3, K3)

19. (a) Describe minimum mean square error (wiener) filtering with an example. (CO4, K5)

Or

(b) Explain constrained least squares filtering with an example. (CO4, K3)

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20. (a) Solve and find a Huffman code and average length of the code and its redundancy for the source emits letters from an alphabet A = {a1, a2, a3, a4, a5} with probabilities P(a1) = 0.2, P(a2) = 0.4, P(a3) = 0.2, P(a4) = 0.1 and P(a5) = 0.1. (CO5, K6)

Or

(b) Discuss in detail about run length encoding with an example. (CO5, K5)

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M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Information Technology

Elective – VIRTUALIZATION AND CLOUD COMPUTING

(CBCS – 2022 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct options.

1. ————————— is a cloud computing service model in which hardware is virtualized in the cloud.   (CO1, K2)

   (a)   IaaS

   (b)   CaaS

   (c)   PaaS

   (d)   None of the mentioned

2.   Which of the following can be identified as cloud?
                                                    (CO1, K1)

   (a)   Web Applications

   (b)   Intranet

   (c)   Hadoop

   (d)   Alt of the mentioned

3. Which of the following SaaS platform is with an exposed API? (CO3, K4)

   (a) salesforce.com

   (b) amazon.com

   (c) flipkart.com

   (d) all of the mentioned

4. A ————— service provider gets the same benefits from a composable system that a user does (CO3, K2)

   (a) CaaS

   (b) AaaS

   (c) PaaS

   (d) All of the mentioned

5. Which of the following type of virtualization is found in hypervisor such as Microsoft's Hyper-V? (CO2, K2)

   (a) paravirtualization

   (b) full virtualization

   (c) emulation

   (d) none of the mentioned

6. Which of the following component is called hypervisor?

   (CO3, K3)

   (a) VGM

   (b) VMc

   (c) VMM

   (d) All of the mentioned

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7. Amazon Machine Images are virtual appliances that have been packaged to run on the grid of ———————— nodes. (CO5, K3)

    (a) Ben   (b) Xen

    (c) Ken   (d) Zen

8. A service provider reselling a ———————— may have the option to offer one module to customize the information. (CO4, K3)

    (a) CaaS   (b) AaaS

    (c) PaaS   (d) SaaS

9. Which of the following are a common means for losing encrypted data? (CO4, K4)

    (a) lose the keys

    (b) lose the encryption standard

    (c) lose the account

    (d) all of the mentioned

10. Which of the following is the standard for interoperable cloud-based key management? (CO4, K5)

    (a) KMIP

    (b) PMIK

    (c) AIMK

    (d) None of the mentioned

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Answer **all** the questions note more than 500 words each

11. (a) Illustrate the differences of distributed and parallel computing. (CO1, K5)

Or

(b) Explain the cloud computing service models. (CO1, K1)

12. (a) Explain the virtualization of CPU, Memory and I/O devices. (CO2, K2)

Or

(b) Distinguish between of full virtualization and para-virtualization. (CO2, K6)

13. (a) Describe the cloud storage with an example. (CO3, K2)

Or

(b) Express any two third party cloud services. (CO3, K4)

14. (a) Explain cloud computing security architecture with example. (CO4, K3)

Or

(b) Compare and contrast the security challenges in cloud computing. (CO4, K5)

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15. (a) Explain the major cloud features of Google applications engine. (CO5, K6)

Or

(b) Classify the terms Hadoop and Microsoft Azure. (CO5, K5)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Explain NIST cloud reference architecture with neat diagram. (CO1, K2)

Or

(b) Explain the characteristics of cloud computing. (CO1, K4)

17. (a) Explain the implementation levels of virtualization. (CO2, K6)

Or

(b) Discuss in detail about Desktop virtualization. (CO2, K4)

18. (a) Discuss about peer to peer architecture in detail. (CO3, K5)

Or

(b) Explain REST ful web services with a suitable example. (CO3, K2)

19. (a) Explain global exchange of cloud resources in detail. (CO4, K2)

Or

(b) Describe in detail about the virtual machine security. (CO4, K3)

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20. (a) Discuss how map reduce framework executes user job with suitable example. (CO5, K6)

Or

(b) Mention the components of Eucalyptus Architectures. (CO5, K5)

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