Reg. No. : .....

(6 pages)

Code No. : 20395 E **Sub. Code : EMCS52**

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2025.

Fifth Semester

Computer Science — Core

DATABASE MANAGEMENT SYSTEM

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which is NOT a problem with the file system?
   (a) Data redundancy
   (b) Data inconsistency
   (c) Data independence
   (d) Difficulty in access

2. Which of the following is not a basic building block of a database?
   (a) Entity (b) Attribute
   (c) Relationship (d) Compiler

3. Integrity rules in RDBMS include:
   (a) Entity integrity and referential integrity
   (b) Primary and foreign keys
   (c) Normalization
   (d) Indexing

4. Which of these reduces data redundancy?
   (a) Denormalization
   (b) Normalization
   (c) Duplication
   (d) Indexing

5. Which command is used to retrieve data from a table?
   (a) INSERT (b) SELECT
   (c) UPDATE (d) DELETE

6. Which clause is used to combine rows from two or more tables?

(a) CONNECT (b) JOIN

(c) LINK (d) BIND

7. The clause used with GROUP BY to filter grouped results is:

(a) WHERE (b) HAVING

(c) FILTER (d) GROUPFILTER

8. Which join returns matching rows from both tables plus non-matching rows from one table?

(a) INNER JOIN (b) OUTER JOIN

(c) NATURAL JOIN (d) SELF JOIN

9. Which type of cursor is automatically created by PL/SQL?

(a) Explicit cursor

(b) Implicit cursor

(c) Parameterized cursor

(d) Cursor variable

10. Which statement is used to end a PL/SQL block?

(a) STOP; (b) COMMIT;

(c) END; (d) CLOSE;

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Distinguish between the data and information.

Or

(b) Show the importance of data models.

12. (a) Describe the tables and their characteristics in logical view of data.

Or

(b) Write a note on data redundancy revisited.

13. (a) Express the process of conversion to first normal form.

Or

(b) Indicate the procedure to creating the database.

14. (a) Illustrate the syntax and example of UNION statement.

Or

(b) Outline the JOIN ON Clause and outer joins with example.

15. (a) Elaborate the block structure of PL/SQL.

Or

(b) Identify the different types of exceptions in PL/SQL.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words.

16. (a) Determine the main functions of DBMS.

Or

(b) Express the degrees of data abstraction.

17. (a) Discuss the relationships within the relational database.

Or

(b) Demonstrate the implementation of Entity Relationship Model (ERM).

18. (a) Explain the requirements of Boyce-Codd Normal Form (BCNF).

Or

(b) What are the advanced data definition commands? Explain.

19. (a) Decide the WHERE Subqueries and IN Subqueries with example.

Or

(b) Examine the different types of string functions in SQL with example.

20. (a) Measure the different types of arithmetic operators with example.

Or

(b) Integrate the WHERE CURRENT OF clause in PL/SQL.

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Code No. : 20394 E **Sub. Code : EMCS 51**

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2025.

Fifth Semester

Computer Science — Core

SOFTWARE ENGINEERING

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Why is software engineering important?
   (a) To increase hardware speed
   (b) To make websites only
   (c) To ensure quality, reliability and maintainability
   (d) To reduce internet cost

2. What is the main difference between a program and a software product?
   (a) Software products are smaller
   (b) Programs are user-friendly
   (c) Software products are professionally developed and maintained
   (d) Programs have documentation

3. Which approach focuses on real-world objects?
   (a) Function-oriented
   (b) Object-oriented
   (c) Waterfall model
   (d) Prototyping

4. Coupling refers to:
   (a) Degree of interdependence between modules
   (b) Independence of a single module
   (c) Internal cohesion of a function
   (d) None of the above

5. DFD stands for:

(a) Data File Diagram

(b) Data Flow Diagram

(c) Data Function Description

(d) Design Flow Diagram

6. Structured Analysis is mainly used in:

(a) Object-oriented design

(b) Function-oriented design

(c) Agile development

(d) Testing

7. Personal Software Process (PSP) focuses on:

(a) Group performance

(b) Tool usage

(c) Individual developer performance

(d) Customer satisfaction

8. Which of the following is a static analysis tool?

(a) Debugger (b) Compiler

(c) Code analyzer (d) Load tester

9. CASE stands for:

(a) Computer Aided Software Engineering

(b) Code Analysis Software Engine

(c) Common Application System Editor

(d) Computer Algorithm Software Environment

10. Software maintenance includes:

(a) Only fixing bugs

(b) Adding new features, adapting and fixing bugs

(c) Writing new code

(d) Deleting old files

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain the emergence and evolution of software engineering as a discipline.

Or

(b) Discuss prototyping model in detail.

12. (a) Compare and contrast cohesion and coupling with examples.

Or

(b) State the qualities of good software design.

13. (a) Outline the key characteristics of a good user interface.

Or

(b) Explain any one user interface development methodology.

14. (a) Differentiate between black-box and white-box testing.

Or

(b) Write a note on SEI Capability Maturity Model.

15. (a) Examine reverse engineering in software maintenance.

Or

(b) Describe the various software maintenance models.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words.

16. (a) Compare all major software life cycle models.

Or

(b) State the importance of software engineering in modern computer systems.

17. (a) Describe the process of requirements gathering and analysis in detail.

Or

(b) Compare object-oriented and function-oriented design.

18. (a) Explain the levels of DFDs used in structured analysis.

Or

(b) Write in detail about function-oriented software design and its phases.

19. (a) Demonstrate the different levels of software testing in detail.

Or

(b) State the stages of debugging and their importance.

20. (a) Illustrate the architecture and functions of a CASE environment.

Or

(b) Discuss the characteristics and phases of software maintenance.

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Code No. : 20396 E **Sub. Code : EMCS 53**

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2025.

Fifth Semester

Computer Science — Core

IMAGE PROCESSING

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Name the first step of digital image processing.
   (a) Image enhancement
   (b) Image acquisition
   (c) Image compression
   (d) Recognition

2. Digitizing the coordinate value is called _____.
   (a) Sampling (b) Segmentation
   (c) Compression (d) Quantization

3. Which filter method is used for blurring an image?
   (a) Smoothing (b) Sharpening
   (c) Gradient (d) Laplacian

4. _____ is used to generate an image that has the desired histogram.
   (a) Histogram matching
   (b) Histogram equalization
   (c) Histogram processing
   (d) Histogram intersection

5. What are the primary colors used to create the secondary color cyan?
   (a) Red, Blue (b) Blue, Green
   (c) Red, Green (d) Green, Blue

6. Which color model is used for color printing?
   (a) HIS (b) CMY
   (c) CMYK (d) RGB

7. In ———— technique, the restored data file is identical to the original.

(a) Lossy (b) Lossless

(c) Gaussian (d) Compression

8. Which morphological processing operation shrinks an image?

(a) Dilation (b) Erosion

(c) Compression (d) Reflection

9. ———— reduces the information needed to represent an image for understanding its content.

(a) Segmentation

(b) Filtering

(c) Feature extraction

(d) Edge linking

10. ———— subdivides an image into its constituent regions.

(a) Feature extraction

(b) Segmentation

(c) Edge detector

(d) Sobel Operator

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain a simple image model.

Or

(b) Explain image sampling and quantization.

12. (a) Explain histogram equalization.

Or

(b) Describe homomorphic filtering.

13. (a) Describe the conversion between color models.

Or

(b) Explain HIS color model.

14. (a) Explain inter-pixel redundancy.

Or

(b) How are logical operations involving in binary images?

15. (a) Define point and line detection.

Or

(b) What is edge linking?

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words

16. (a) Explain the components of digital image processing.

Or

(b) Define various image acquisition methods.

17. (a) Describe sharpening spatial filters.

Or

(b) Explain the smoothing frequency domain filtering.

18. (a) Explain color transformation.

Or

(b) What is pseudo-color image processing? How can a grayscale image be converted into a color image?

19. (a) Draw the image compression model and describe the work of each block.

Or

(b) What do you understand by Opening and Closing in morphological segmentation? Prove the relationship between them.

20. (a) Describe the role of thresholding in segmentation.

Or

(b) What is edge linker? Discuss Global edge linker.

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Reg. No. : .....

Code No. : 20405 E **Sub. Code : EECS 51**

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2025.

Fifth Semester

Computer Science

Elective – CLOUD COMPUTING

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Cloud computing is primarily based on _____.
   (a) Distributed computing
   (b) Local computing
   (c) Personal computing
   (d) Parallel computing only

2. Elasticity in cloud computing means:
   (a) Ability to change the network speed
   (b) Ability to scale resources up or down as needed
   (c) Flexibility in billing
   (d) Elastic cables in data centers

3. Windows Azure Table Service is a _____.
   (a) Relational database
   (b) NoSQL database
   (c) File storage system
   (d) Messaging service

4. Amazon S3 is used for _____.
   (a) Running applications
   (b) Object storage
   (c) Data analytics
   (d) Virtual machine creation

5. RESTful web services use _____.
   (a) HTTP methods (b) SMTP
   (c) FTP (d) POP3

6. MVC in application design stands for _____.

(a) Model View Controller
(b) Master Virtual Control
(c) Managed Virtual Cloud
(d) Multiple View Components

7. Data security in the cloud involves_____

(a) Securing data at rest and in motion
(b) Securing only network cables
(c) Encrypting passwords only
(d) Restricting software updates

8. Auditing in cloud security is used for_____

(a) Tracking and recording activities
(b) Encrypting files
(c) Speeding up processing
(d) Allocating more RAM

9. Cloud-based healthcare systems can improve _____.

(a) Patient data access and sharing
(b) Server load only
(c) Email marketing
(d) Physical office decoration

10. The main advantage of cloud for education and healthcare is_____

(a) Scalability and accessibility
(b) High electricity bills
(c) Manual record keeping
(d) Local storage dependency

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Review the characteristics of cloud computing.

Or

(b) Outline the cloud computing for energy systems.

12. (a) Measure the windows azure virtual machines.

Or

(b) Enumerate the Amazon simple storage service.

13. (a) Narrate the Amazon identity and access management.

Or

(b) Recall the analytics services of Amazon elastic MapReduce.

14. (a) Elaborate the RESTful Web Services for cloud applications.

Or

(b) Discover the purpose of model view controller.

15. (a) Write down the concept of Single Sign-on (SSO).

Or

(b) Identify the securing data in motion of data security.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Determine the use of Google App Engine in PaaS.

Or

(b) Express the load balancing in cloud computing.

17. (a) Discuss the notification services and media services in cloud.

Or

(b) Predict the windows azure content delivery network.

18. (a) Compare and construct the CloudStack and OpenStack.

Or

(b) Analyze the design considerations for cloud applications.

19. (a) Rephrase the IaaS, PaaS and SaaS services for cloud applications.

Or

(b) Examine the importance of Non-Relational (No-SQL) approach.

20. (a) Discover the CSA Cloud Security Architecture with diagram.

Or

(b) Appraise the key management in cloud security.

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