S–6345

Sub. Code
23MIT1C1

M.Sc. DEGREE EXAMINATION, APRIL 2025.

First Semester

Information Technology

PYTHON PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define Variable assignment.
2. Enumerate Floating point numbers.
3. Quote Function in python.
4. State Variable scope.
5. Tablet Module.
6. State Object oriented programming.
7. Spell out Labels.
8. Represent Textbox.
9. How to Creating tables?
10. Give examples of Insert.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe Standard type build in functions.

Or

(b) Classify Conditional statements.

12. (a) Explain Functional programming.

Or

(b) Discuss Formal arguments.

13. (a) Interpret Importing modules.

Or

(b) Classify inheritance.

14. (a) How do you create a radio button? Explain with example.

Or

(b) Describe generic widget properties.

15. (a) Generalize insert.

Or

(b) Justify read.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain Sequences.

17. How to Create and passing values in the functions?

18. Discuss Exceptions in python.

19. Summarize Frames.

20. How to connect a database using mango DB? Explain.

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S–6352	Sub. Code
	23MIT2C1

M.Sc. DEGREE EXAMINATION, APRIL 2025.

Second Semester

Information Technology

DATABASE SYSTEMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What are some common applications of database systems?

2. Mention the components of a database schema.

3. State primary key constraint in a relational database.

4. Why is the Boyce-Codd Normal Form (BCNF) used?

5. Express the 'durability' property of a transaction.

6. Define the term 'deadlock' in the context of concurrency control.

7. Delineate the concept of data fragmentation in distributed databases.

8. Write short notes on distributed transaction.

9. How do retrieve all columns from a table named Employees?

10. Differentiate PL/SQL procedure and PL/SQL function.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Enlighten the role of database systems in data management and organization. How do they ensure data is stored efficiently?

Or

(b) Define a database schema and explain its significance in a database management system.

12. (a) Illustrate the main phases of the database design process and their significance.

Or

(b) How does normalization help in removing redundant attributes from an entity set? Discuss briefly.

13. (a) Elucidate the concept of 'transaction serializability' and its importance in ensuring correct transaction execution. How is it achieved in practice?

Or

(b) Illuminate the ARIES (Algorithm for Recovery and Isolation Exploiting Semantics) recovery algorithm, including its phases and how it ensures atomicity and durability.

14. (a) What is a 'commit protocol' in distributed transactions, and how does it help maintain data consistency?

Or

(b) Discuss the role of 'lock-based protocols' in distributed concurrency control. What are the main types of locks used, and how do they help manage concurrent transactions?

15. (a) Describe how subqueries can be used in SQL. Provide examples of different types of subqueries (e.g., scalar, row, table).

Or

(b) Discriminate implicit and explicit cursors. Provide examples of how to declare, open, fetch, and close a cursor in PL/SQL.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Illustrate the structure of relational databases.

17. How can functional dependency be used to resolve data anomalies in database design? Provide examples of how these anomalies occur and how functional dependencies help prevent them.

18. Explain the concept of a transaction log and its role in maintaining database integrity and supporting recovery operations.

19. Compare and contrast homogeneous and heterogeneous databases. Discuss their key characteristics, advantages, and challenges.

20. What is a View in SQL, and how is it created and utilized? Describe the process of creating a view, its advantages, and potential limitations. Provide examples of how views can simplify complex queries and enhance data security.

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S–6354

Sub. Code
23MIT2E2

M.Sc. DEGREE EXAMINATION, APRIL 2025.

Second Semester

Information Technology

Elective – BIOMETRIC TECHNIQUES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Differentiate biometric and traditional techniques.

2. What are the biometric key terms?

3. Mention the advantages of facial scan.

4. List out any two competing technologies of finger scan.

5. Define iris scan.

6. Mention the advantages of voice can.

7. Give a note on Bioluminescence.

8. Write down the advantages of using keystroke scan.

9. Mention any four biometric applications.

10. List out the advantages of using biometric applications.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe about biometric matching.

Or

(b) Illustrate false non-match rate with an example.

12. (a) Discuss the components of finger scan.

Or

(b) What are the emerging trends in facial scan?

13. (a) Give a short note on voice scan.

Or

(b) Explain some other physiological biometrics with an example.

14. (a) How does signature scan works? Explain.

Or

(b) Write a short note on foot dynamics.

15. (a) How does biometric applications improve user experience in PC and network access?

Or

(b) What are the challenges in deploying biometric applications for surveillance?

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Elucidate the importance of failure to enroll rate.

17. How facial scan works? Explain.

18. How does iris scanning capture the iris image?

19. Describe in detail about vein pattern.

20. What is the role of biometric applications in E-Commerce? Explain.

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S–6356

Sub. Code
23MIT2E4

M.Sc. DEGREE EXAMINATION, APRIL 2025.

Second Semester

Information Technology

Elective – SOFTWARE ENGINEERING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What do you mean by system software?

2. Write one of the key features of spiral model.

3. Define feasibility study.

4. What is requirement elicitation?

5. Define ER diagram.

6. Define modularity.

7. What is data abstraction?

8. Define coupling.

9. What are the fundamentals of software testing?

10. Define risk management.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write a short notes on spiral model. What are the advantages of spiral model?

Or

(b) Discuss in brief the inputs and outputs of each phase of waterfall model.

12. (a) Explain the various requirement validation techniques with suitable examples.

Or

(b) Write a short note on behavioural modelling.

13. (a) Write a short note on stepwise refinement.

Or

(b) What is a design model? What are the components required to design a complete design model?

14. (a) Define testability. Write the characteristics of testability.

Or

(b) Discuss the difference between black box and white box testing.

15. (a) How will you identify the risk in software projects?

Or

(b) What is software quality assurance? Explain it.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Design a simple Software for Student Information Management System which can perform the following operations:

    (a) Store the First name of the student.

    (b) Store the Last name of the student,

    (c) Store the unique Roll number for every student.

    (d) Store the CGPA of every student.

    (e) Store the courses registered by the student.

17. What are the requirements modelling approaches? Write the significance of data modelling.

18. Discuss in detail about data flow architecture with neat diagram.

19. What are software testing strategies? How will you develop a software testing strategy?

20. Define software reliability and explain in detail with suitable example.

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S–6359

Sub. Code
23MIT2S1

M.Sc. DEGREE EXAMINATION, APRIL 2025.

Second Semester

Information Technology

WEB DESIGN

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A ($10 \times 2 = 20$)

Answer **all** the questions.

1. How will you design a navigation bar in a website? Explain.

2. Write short note on Home page layout

3. Compare web 1.0, web 2.0 and web 3.0.

4. How does the World Wide Web work?

5. What is a Tag in HTML?

6. What is an Anchor tag in HTML?

7. What is the use of Cascading Style Sheet?

8. How do you change background color by using CSS?

9. List the popular web design software's.

10. What is meant by web hosting?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Briefly explain how to design a webpage? Give steps.

Or

(b) What is Web 3.0? What are its typical characteristics? What are the potentials and pitfalls of web 3.0?

12. (a) Briefly explain the evolution of Internet.

Or

(b) Explain the method of adding images in your Web page with an example.

13. (a) Discuss on HTML Table and List with example.

Or

(b) How will you design HTML forms and its controls? Explain with examples.

14. (a) Discuss on CSS Selectors.

Or

(b) How do you set background color and image in CSS? Explain.

15. (a) How will you create the structure of website? Explain.

Or

(b) What is web server? Explain client server communication.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. What are the principles involved in developing a web site? Explain.

17. Briefly discuss the evolution of internet.

18. Discuss in detail about various frames and controls in HTML with suitable example.

19. How will you create page layout and site designs using CSS? Explain.

20. Design a simple web page for Tourism information system by using HTML tags.

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S–6366

Sub. Code
23MIT4C1

M.Sc. DEGREE EXAMINATION, APRIL 2025

Fourth Semester

Information Technology

.NET WITH C# PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** Questions

1. What is the purpose of C#?
2. When was the first version of C# released?
3. How will you define client side programming?
4. What is the file extension for C#?
5. Name the two components of .NET framework.
6. What are web farms?
7. Expand ADO.NET
8. What type of operators are 'GroupBy' and 'ToLookup'.
9. List the use of ADO.NET.
10. Provide the two ways by which data can be filtered.

Part B

$(5 \times 5 = 25)$

Answer **all** questions choosing either (a) or (b).

11. (a) List the uses of C#.

Or

(b) With examples, explain the various types of data types in C#.

12. (a) Write the disadvantages of .NET framework.

Or

(b) Why should you use ASP.NET? Explain.

13. (a) Name any five server controls in ASP.NET.

Or

(b) Write a ASP program to show the use of hidden control.

14. (a) Explain the join operators in LINQ.

Or

(b) Show the properties of the Login Control.

15. (a) Why should we use ADO.NET? Discuss.

Or

(b) Explain simple data binding.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Describe in detail the types, objects and namespaces in C#.

17. With coding snippets, explain cookies in ASP.NET

18. Explain in detail the AdRotator control using programming examples.

19. Provide a detailed note on password recovery control in ASP.NET.

20. List out the features of ADO.NET and explain.

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S–6369	Sub. Code
	23MIT4E3

M.Sc. DEGREE EXAMINATION, APRIL 2025

Fourth Semester

Information Technology

Elective – VIRTUAL AND AUGMENTED REALITY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What is Virtual Reality?

2. Mention the input devices of Virtual Reality.

3. What is meant by Rendering Pipeline?'

4. Mention any four traditional applications of VR.

5. Write any working principle of Augmented Reality.

6. Why Digital Enhancement of the real world rather than Physical Enhancement?

7. Write the roles of sensors.

8. List any four tools of AR Technology.

9. What are the three basic types of visual content for AR applications?

10. What is Mobile AR?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write a brief note on Gesture Interfaces.

Or

(b) Discuss briefly about Early commercial VR Technology.

12. (a) Briefly explain on computer architecture for VR.

Or

(b) Explain in brief about VR programming.

13. (a) What is meant by Virtuality? And Explain about the Virtuality Continuum.

Or

(b) Explain Metaverse in a brief manner.

14. (a) Describe briefly the primary classes of visual displays utilized in AR applications.

Or

(b) Describe briefly the two primary software categories for creating and editing 3D graphics.

15. (a) Give a brief note on creating content for Audio.

Or

(b) Explain the disadvantages of Mobile AR.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain in detail about the Components of VR System.

17. Explain in detail about the emerging applications of VR.

18. Discuss in detail about the ingredients that make for an Augmented reality experience.

19. Give a detailed description of the processor system architectures utilized in AR applications.

20. Give a detailed note on the three primary categories of Interaction with the virtual world.

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S–6370	Sub. Code
	23MIT4S1

M.Sc. DEGREE EXAMINATION, APRIL 2025

Fourth Semester

Information Technology

PROFESSIONAL COMPETENCY FOR UGC NET/SLET

(CBCS – 2023 onwards)

Time : 3 Hours Maximum :75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. State the term "logical equivalence" and provide an example of two logically equivalent propositions.

2. What are a logic gate, and its purpose in digital circuits? Give an example of a basic logic gate and its function.

3. Write the concept of data abstraction in programming language design. Why is it important?

4. Differentiate primary key and a foreign key in a relational database.

5. Name the function of an operating system kernel.

6. Delineate software bug and how does 'debugging' involve.

7. Specify the term "halting problem" in computation theory.

8. Define regular language. Provide an example.

9. Discriminate narrow AT and general AI.

10. Mention the basic components of Genetic Algorithm.

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

Answer **all** questions, choosing either (a) or (b).

11. (a) Consider the following undirected graph:

Vertices : A, B, C, D, E

Edges : (A, B),(A, C),(B, C),(B, D),(C, D),(D, E)

(i) Draw the graph.

(ii) Determine if the graph is connected. Justify your answer.

(iii) Find the degree of each vertex.

Or

(b) Perform the following binary operations and provide the result in binary:

(i) $1011_2 + 1101_2$

(ii) $11010_2 - 1011_2$.

12. (a) Describe the Bresenham's line drawing algorithm.

Or

(b) Elaborate the concept of normalization in relational databases. Discuss its objectives and benefits.

13. (a) Discuss the concept of process synchronization and state the problems and its addresses.

Or

(b) Discriminate P and NP classes in complexity theory. Enlighten the significance of the P vs. NP problem and provide examples of problems that are known to be in P and NP.

14. (a) Explicate the closure properties of context-free languages. What operations on context-free languages result in context-free languages?

Or

(b) Enlighten the role of Hypertext Transfer Protocol (HTTP) in the World Wide Web. How does HTTP facilitate communication between clients and servers?

15. (a) Elucidate the concept of "tokenization" in NLP and its importance.

Or

(b) Explain the difference between declarative and procedural knowledge representation. Provide an example of each.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Prove by mathematical induction that for all positive integers n, the following statement holds:

$1 + 3 + 5 + \cdots + (2n - 1) = n^2$.

(a) Verify the base case where $n = 1$.

(b) Assume that the formula holds for some positive integer k, i.e., assume:

$1 + 3 + 5 + \cdots + (2k - 1) = k^2$.

Prove that the formula holds for k+1, i.e., show that:

$1 + 3 + 5 + \cdots + (2k - 1) + (2(k + 1) - 1 = (k + 1)^2$

(c) Conclude the proof.

17. Illustrate the various types of database architectures and their characteristics. Discuss in briefly.

18. Discuss the role of Software Quality Assurance (SQA) in software engineering. Explain different SQA activities and techniques used to ensure software quality.

19. Elucidate the concept of Error Detection and Correction in data communication. Explain how checksums and cyclic redundancy checks (CRC) are used to detect errors.

20. Briefly describe the concept of Neural Networks in AI and their basic structure.
