S–0915

Sub. Code
23MCI1C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

First Semester

Computer Science and Information Technology

DATA STRUCTURES AND ALGORITHMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Describe the successor in a linked list.

2. Define a list traversal.

3. Give a note on the basic operations on the stack.

4. What is the circular queue?

5. State and explain the binary search tree.

6. Mention the advantages of Hashing.

7. Explain divide and conquer.

8. List out the advantages of merge sort.

9. Define time complexity.

10. Brief note on big oh notation.

Part B (5 × 5 = 25)

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

11. (a) What are the characteristics of a good Data Structure?

Or

(b) Explain how a list can be implemented using an array.

12. (a) Differentiate between a circular queue and a linear queue.

Or

(b) Write a note on a singly linked and doubly linked list.

13. (a) Brief note on the key properties of binary trees.

Or

(b) Describe non-linear data structure and linear data structure.

14. (a) Give a brief note on quick sort with examples.

Or

(b) Write a note on time complexity analysis in quick sort.

15. (a) Mention the characteristics of an algorithm.

Or

(b) Briefly discuss Omega notation and Theta notation.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Write an algorithm to insert an element in an array at a given position.

17. Illustrate the operations of doubly linked list with an example.

18. Discuss different hashing techniques in detail.

19. Write an algorithm for selection sort and bubble sort.

20. Explain Big-O, Omega and Theta notations with examples.

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S–0916

Sub. Code
23MCI1C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

First Semester

Computer Science and Information Technology

ADVANCED JAVA PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define Object.

2. What is thread?

3. What is exception handling?

4. What is string buffer?

5. What are different types of JDBC Drivers?

6. What is JDBC Statement?

7. What is a servlet?

8. What is JSP?

9. What is a Lambda Expression?

10. What is functional interface in Java?

Part B (5 × 5 = 25)

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

11. (a) Describe the characteristics of object oriented programming concepts.

Or

(b) Describe the features of java programming language.

12. (a) Evaluate the Java Generics using map concept using suitable program.

Or

(b) Define package Discuss its advantages. Write different types of packages.

13. (a) Explain the different types of JDBC Drivers.

Or

(b) Discuss about networking in java in detail.

14. (a) Explain the Life Cycle of a servlet.

Or

(b) Write the advantages of using JSP. How does JSP work?

15. (a) Explain the Functionalities of Lambda Expression in detail.

Or

(b) Discuss about the Structure of Lambda Expression. Explain its Parameters.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about the Lifecycle and States of a Thread in Java.

17. List the different types of inheritance in java? Write each of them in detail.

18. What is JDBC Connection? Explain steps to get Database connection in a simple java program.

19. What is a Java Serviet? Explain about Java Servlet Architecture.

20. Explain the benefits of using lambda expressions. What is type inference in lambda expressions? How does it work in Java?

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S–0917

Sub. Code
23MCI1C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

First Semester

Computer Science and Information Technology

STATISTICAL COMPUTING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is Correlation?

2. How to find the Correlation Coefficient?

3. What is regression analysis?

4. Define standard error of estimate.

5. What are random variables?

6. Define probability.

7. Define sampling.

8. What are sampling distributions?

9. What is inference?

10. What is interval in statistical inference?

Part B (5 × 5 = 25)

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

11. (a) Calculate the correlation coefficient of the given data.

X	50	51	52	53	54
Y	3.1	3.2	3.3	3.4	3.5

Or

(b) Explain about (i) Coefficient of linear correlation (ii) Coefficient of determination.

12. (a) Fit the straight line to the following data.

X	1	2	3	4	5
Y	1	2	3	4	5

Or

(b) Discuss about the properties of regression coefficients in detail.

13. (a) Let X be a random variable with probability distribution

X	0	1	2	3
f(x)	1/3	1/2	0	1/6

Find the expectation of X, $X^2$and $(X - 1)^2$. Also find the variance of X.

Or

(b) Define 'random variable'. How do you distinguish between 'discrete' and 'continuous' random variables? Illustrate your answer with examples?

14. (a) Explain in detail about the limitations of sampling.

Or

(b) Discuss about the principles of sampling in detail.

15. (a) Explain about the significance of mean.

Or

(b) What is hypothesis? Explain about testing of hypothesis.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Calculate correlation of the following data using Karl Pearson's method.

X	112	114	108	124	145	150	119	125	147	150
Y	200	190	214	187	170	170	210	190	180	181

17. Calculate the regression coefficient and obtain the lines of regression for the following data.

X	1	2	3	4	5	6	7
Y	9	8	10	12	11	13	14

18. If a coin is tossed 3 times, then find the probability of getting exactly two heads.

19. Discuss about the Important Terminologies in Sampling Distribution.

20. A sample of 100 items, draw from a universe with mean value 4 and S.D 3, has a mean value 63.5. Is the difference in the mean significant?

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S–0918

Sub. Code
23MCI1E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

First Semester

Computer Science and Information Technology

Elective – MULTIMEDIA AND ITS APPLICATIONS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is multimedia?

2. Where to use multimedia?

3. Define bitmap image.

4. What is vector image?

5. What is MIDI?

6. What is digital audio?

7. Define animation.

8. What is multimedia hardware?

9. Define internetworking.

10. Define internet.

Part B (5 × 5 = 25)

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

11. (a) List the components of multimedia system.

Or

(b) Explain five desirable features in multimedia systems.

12. (a) Explain about the working principle of color palettes in images.

Or

(b) Explain the image fundamentals and its objectives.

13. (a) In what way sounds can be added in multimedia project?

Or

(b) Explain the different components of MIDI.

14. (a) Convey how animation can be done in multimedia project.

Or

(b) List out the skills needed in developing animation files.

15. (a) Explain how text, image and sound helps in producing effective multimedia with an example.

Or

(b) Explain (i) Animation for the web (ii) Sound for the web.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about Hypermedia and hypertext in multimedia.

17. Explain about the various color models and its applications in multimedia systems.

18. What are MIDI devices? Why MIDI devices are required in multimedia systems?

19. Discuss about multimedia authoring systems in animation handling.

20. Explain how the world web is helpful in designing the multimedia systems.

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S–0921

Sub. Code
23MCI2C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Second Semester

Computer Science and Information Technology

ADVANCED DATABASE MANAGEMENT SYSTEMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is Relational database design?

2. Define 1NF.

3. What is protocol?

4. Define concurrency control.

5. What is database Query?

6. What is Recursive query processing?

7. What is Database?

8. What is XHTML?

9. What is Intervals?

10. What is Temporal database?

Part B (5 × 5 = 25)

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

11. (a) Explain about Inter query parallelism.

Or

(b) Discuss about Intra query parallelism.

12. (a) Write a short note on Array and Multiset.

Or

(b) Discuss about Table inheritance.

13. (a) List out the techniques of spatial data base query.

Or

(b) Write a short note on spatial data model.

14. (a) Describe the functions of XML schema.

Or

(b) Explain about detective database systems.

15. (a) Explain about Database design.

Or

(b) Discuss about Integrity constraints.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss about Interoperation parallelism in detail.

17. Write a detailed note on Distributed data storage.

18. Discuss about Logic based databases.

19. Explain about XHTML and its uses.

20. Explain about generalizing the relational operators and its functions.

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S–0922

Sub. Code
23MCI2C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Second Semester

Computer Science and Information Technology

OPEN SOURCE TECHNOLOGIES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is open source software?

2. Name two popular open source operating systems.

3. What does PHP stand for?

4. Is PHP a client-side or server-side scripting language?

5. Which command is used to retrieve data from a MySQL database?

6. Can MySQL be used with PHP?

7. What is the file extension for Python files?

8. Is Python case-sensitive?

9. Give two examples of open source programming languages.

10. What is IDE platform?

Part B (5 × 5 = 25)

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

11. (a) Explain the advantages of Open Source Software.

Or

(b) Discuss about the Key Characteristics of open source.

12. (a) Explain in detail about working with forms.

Or

(b) Discuss about form validation in PHP.

13. (a) Discuss in detail about record selection technology.

Or

(b) Explain the importance of working with strings.

14. (a) In what way strings and style can be performed in python?

Or

(b) Explain in detail about lists and tuples in python.

15. (a) Discuss about apache web server in open source.

Or

(b) Explain in detail about the working with web server.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about cloning and backup Linux system in detail.

17. In what way advanced PHP concepts helps in creating web pages?

18. How can emails can be send and receiving in PHP?

19. Discuss about conditionals and loops in Python.

20. Write about the importance of open source in E-Governance.

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S–0923

Sub. Code
23MCI2C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Second Semester

Computer Science and Information Technology

COMPILER DESIGN

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Give the notation that is commonly used for defining the syntax of programming languages.

2. State the limitations of a simple one-pass compiler.

3. List down the goals of parsing in the compilation process.

4. Name the types of information that can be stored in a symbol table entry.

5. How does a syntax tree differ from a parse tree?

6. What is an SDD in compiler design?

7. Name one characteristic of a good intermediate language.

8. What is call-by-value parameter passing?

9. How are loops represented in a control flow graph?

10. Describe the output of a simple code generator fro a basic arithmetic expression.

Part B

$(5 \times 5 = 25)$

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

11. (a) Explain the role of the lexical analyzer in the compilation process.

Or

(b) How are constants handled during lexical analysis?

12. (a) Describe the structure of context-free grammars.

Or

(b) Explain the process of top-down parsing using recursive descent.

13. (a) Discuss the challenges in translating complex expressions involving different operators and precedence rules.

Or

(b) Explain how translation schemes can be adapted for handling function calls and parameter passing.

14. (a) How are type declaration handled in compilers?

Or

(b) Discuss the impact of memory hierarchy on storage organization strategies in compilers.

15. (a) Discuss the role of peephole optimization in code optimization with examples.

Or

(b) State the challenges in generating code for high-level language constructs? Provide examples.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the methods used for error handling during lexical analysis.

17. Describe the construction of a predictive parsing table and its usage in the parsing process?

18. How are inherited and synthesized attributes used in syntax-directed definitions? Provide examples.

19. Describe the role of l-values and r-values in the compilation of assignment statements

20. Explain the techniques of dead code elimination and constant folding and their role in the optimization of basic blocks.

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S–0928

Sub. Code
23MCI3C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Third Semester

Computer Science and Information Technology

DATA SCIENCE AND MACHINE LEARNING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. State the significance of datafication.

2. Define population and sample in the context of statistical analysis.

3. Name the commonly used plots in EDA.

4. What is data analysis in the context of data science?

5. Define a recommendation system.

6. What is dimensionality reduction in machine learning?

7. Define concept learning in machine learning.

8. Write the candidate elimination algorithm.

9. What is the Maximum Likelihood Estimation principle?

10. Define Bayes' Theorem.

Part B (5 × 5 = 25)

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

11. (a) Differentiate between discrete and continuous probability distributions.

Or

(b) State the challenges in fitting a model to data.

12. (a) How does the K-Nearest Neighbors algorithm classify data points?

Or

(b) Describe the key steps in Exploratory Data Analysis.

13. (a) Explain the decision trees and their advantages in classification problems.

Or

(b) Discuss different strategies to improve user retention using data analytics.

14. (a) State the role of heuristics in machine learning and search algorithms.

Or

(b) What is the significance of inductive bias in machine learning models?

15. (a) Discuss the relevance of mistake bound model in computational learning.

Or

(b) Compare and contrast finite and infinite hypothesis spaces in machine learning.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the role of statistical inference in data science with suitable examples.

17. Explain the working of linear regression with an example.

18. Explain Singular Value Decomposition with real-world applications.

19. Describe the decision tree learning algorithm with example.

20. Explain the Naïve Bayes Classifier with example and give its strength and weakness.

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S–0929

Sub. Code
23MCI3C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Third Semester

Computer Science and Information Technology

ADVANCED WEB TECHNOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What are HTML elements?

2. What is Java Script?

3. What is Construction?

4. Define Interface.

5. What is DOM?

6. Define PHP.

7. What is API?

8. What is Node JS?

9. What is angular?

10. Define bootstrap.

Part B (5 × 5 = 25)

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

11. (a) Explain in detail about Document Object Model.

Or

(b) Explain how to find and change HTML elements.

12. (a) Discuss about :

(i) Introspection

(ii) Serialization.

Or

(b) Explain about advanced database techniques in object oriented programming.

13. (a) Discuss about XML document structure in detail.

Or

(b) Explain the concept of PHP framework.

14. (a) Explain about rich module ecosystem in detail.

Or

(b) Discuss about Serving JSON in Node js.

15. (a) In what way angular environment can be set in angular?

Or

(b) Bring out the core concepts of angular in detail.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss how native mobile apps can be build using javaScript.

17. Explain about constructors and destructors in PHP.

18. Enumerate the working of AJAX web application model in detail.

19. Discuss about front-end versus back-end javascript in node js.

20. Bring out how the communication is handled in parent and child communication.

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S–0930

Sub. Code
23MCI3C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Third Semester

Computer Science and Information Technology

DISTRIBUTED OPERATING SYSTEM

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write down the strategies for handling deadlocks.

2. Define reusable resources with an example.

3. State the issues in distributed operating systems.

4. Define a distributed operating system.

5. What is a distributed file system?

6. Define distributed shared memory

7. Write a note on fault tolerance in computing?

8. Define a two-phase commit protocol.

9. Outline the role of memory management in multiprocessor systems?

10. Define threads in the context of an operating system.

Part B (5 × 5 = 25)

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

11. (a) Compare and contrast monolithic and microkernel design approaches.

Or

(b) Explain the critical section problem with an example.

12. (a) State the importance of global state in distributed systems.

Or

(b) Differentiate between token-based and non-token-based distributed mutual exclusion algorithms.

13. (a) Explain the primary functions of distributed resource management.

Or

(b) State the mechanisms used in distributed file systems.

14. (a) Discuss the advantages and disadvantages of dynamic voting protocols.

Or

(b) What are non-blocking commit protocols, and how do they improve system reliability?

15. (a) Compare and contrast user-level threads and kernel-level threads.

Or

(b) Explain the features and functionalities of database operating systems.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss in detail how systems handle reusable and consumable resources with real-world examples.

17. State the significance of the different agreement protocols used in distributed computing.

18. Illustrate the architecture of distributed shared memory with a neat diagram.

19. Explain the various approaches to recovery in distributed systems in detail.

20. Outline the different processor scheduling techniques used in multiprocessor operating systems.

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S–0931

Sub. Code
23MCI3E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Third Semester

Computer Science and Information Technology

Elective: BLOCK CHAIN TECHNOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. List out the types of Block chain.
2. Write down the benefits of block chain.
3. What is meant by Cryptography?
4. Define Private key.
5. Write a note on Namecoin.
6. Expand Primecoin.
7. Describe Ethereum 101.
8. What is data mining?
9. Write a note on Internet of Things.
10. How does Block chain Security is work?

Part B (5 × 5 = 25)

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

11. (a) Write a short note on CAP theorem in block chain.

Or

(b) How Decentralization is used in block chain?

12. (a) Difference between Symmetric and Asymmetric Cryptography.

Or

(b) Discuss the Financial marketing and trading with an example.

13. (a) Explain Bitcoin Limitation in detail.

Or

(b) Elaborate Litecoin in block chain with an example.

14. (a) Write a brief note on Pre-compiled contracts.

Or

(b) List out the application developed on Ethereum.

15. (a) Explain how block chain improves security in financial transactions.

Or

(b) Define Internet of Things (IoT), and how does block chain supports?

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Write down the benefits and limitation of block chain with an example.

17. Explain Cryptography and Technical Foundation in detail.

18. What is bitcoin? Explain, how it works in bitcoin?

19. Describe Ethereum and explain the elements of Ethereum block chain.

20. How block chain is used outside of cryptocurrencies, with examples for government, healthcare, and finance?

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S–0932

Sub. Code
23MCI3E2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Third Semester

Computer Science and Information Technology

Elective: WEB SERVICES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Name the tools that are used to test web services.
2. What is a Web Service Provider?
3. What are the three 3 main parts of web services?
4. What is the architecture of web services?
5. What is reliable messaging?
6. Define document navigation.
7. What is WSDL binding?
8. What are WSDL elements?
9. Define service discovery.
10. What is integration in web services?

Part B (5 × 5 = 25)

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

11. (a) Explain the tools and technologies which enables web services.

Or

(b) Discuss about the challenges in distributed computing.

12. (a) Explain the core building blocks of web services in detail.

Or

(b) Discuss the basic steps of implementing web services.

13. (a) Bring out the service roles in a SOA in detail.

Or

(b) Explain in detail about the structure if a SOAP message.

14. (a) List out the limitations of WSDL with a neat sketch.

Or

(b) Explain in detail about WSDL document.

15. (a) Discuss about UDDI data models with a neat diagram.

Or

(b) Describe the functions of discovery and integration in servicing the web.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the concept of evolution and emergence of web services in detail.

17. Explain about web service Architecture in details.

18. Explain about Simple Object Access Protocol with a neat diagram.

19. Differentiate WSDL 1.1 versus WSDL 2.0 with necessary points.

20. Discuss about UDDI architecture with a neat diagram.

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S–0933

Sub. Code
23MCI3E3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Third Semester

Computer Science And Information Technology

Elective : DIGITAL IMAGE PROCESSING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is digital image processing?

2. Define sampling.

3. Define Histogram.

4. What is High pass filter?

5. Define restoration.

6. What is inverse filtering?

7. Define Inter pixel.

8. What is Image pixel?

9. What is pattern recognition?

10. Define Bayes classifier.

Part B (5 × 5 = 25)

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

11. (a) Explain about Hotelling transforms in detail.

Or

(b) Discuss about Karhunern-Leove transforms.

12. (a) Briefly discuss about frequency domain methods in detail.

Or

(b) Explain about spatial domain methods with neat sketch.

13. (a) What is image degradation and restoration? Explain them with example.

Or

(b) Explain the inverse filtering with suitable example.

14. (a) What is image compression? Explain any four variable length coding compression schemes.

Or

(b) Explain about Lossy compression?

15. (a) Discuss about linear discrimination function in detail.

Or

(b) Explain the role of relaxation algorithm in detail.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. In detail explain the fundamental steps involved in digital image processing Systems.

17. Show the various techniques in frequency domain to enhance a image with examples.

18. Explain the process of filtering and Compare all filtering methods.

19. Differentiate between lossless and lossy compression and explain transform coding system with a neat diagram.

20. List out the basic problems in problem recognition system design in detail.

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S–0934

Sub. Code
23MCI3S1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Third Semester

Computer Science And Information Technology

E - COMMERCE

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. List out the cards available in E-commerce.

2. What is E-commerce framework?

3. What is a Distribution network?

4. What is global information distribution network in e-commerce?

5. What is Internet governance?

6. What is Internet terminology?

7. Why is e-payment important?

8. What is Credit card?

9. What is mobile and wireless computing?

10. Define personal communication service.

Part B (5 × 5 = 25)

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

11. (a) Discuss about the different types of E-Commerce.

Or

(b) Write the advantages and disadvantages of E-Commerce.

12. (a) Briefly discuss network access equipment in E-Commerce.

Or

(b) List out the ways of forces influencing the I-Way.

13. (a) Explain about the internet terminology in detail.

Or

(b) Briefly discuss about the Last Mile in Electronic commerce.

14. (a) Discuss about risk and electronic payment system.

Or

(b) Explain the Disadvantages of Electronic Payment System.

15. (a) Explain about personal communication service.

Or

(b) Explain about mobile computing applications.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss about the anatomy of Electronic Commerce applications.

17. Write a detailed note on public policy issues shaping the I-Way.

18. Discuss about NSFNET its architecture and components.

19. Discuss about Digital Token-Based Electronic Payment system in detail.

20. Describe about mobile computing framework.

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