S–4176

Sub. Code
23MCE1C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Computer Science

ANALYSIS AND DESIGN OF ALGORITHMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. List the types of problems.

2. What is meant by Recurion?

3. What is the strategy behind divide and conquer technique?

4. What is Convex Hull Problem?

5. What do you mean by dynamic programming?

6. Write a note on binomial coefficient.

7. What is backtracking?

8. What is branch and bound?

9. Give an example for NP-hard problem.

10. Define NP-Complete Problem.

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

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

11. (a) Write an algorithm to find the biggest of four numbers.

Or

(b) How do you determine the efficiency of an algorithm? Explain with an example.

12. (a) How large integers are multiplied? Explain.

Or

(b) Describe greedy method to solve a problem.

13. (a) Describe knapsack problem.

Or

(b) Write and explain Floyd's Algorithm.

14. (a) Describe Hamiltonian circuit problem.

Or

(b) How do you find shortest path in a digraph? Explain briefly.

15. (a) How NP-hard problems are approximated? Explain.

Or

(b) How NP-complete optimization problems are approximated? Explain.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain asymptotic notation for algorithm analysis.

17. Explain Prim's algorithm to find minimum spanning tree in a graph.

18. Write and explain Flyd's algorithm to find shortest path in a graph.

19. Write an algorithm to solve 8-Queens problem.

20. Write an algorithm to solve Travelling Salesman Problem.

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S–4177

Sub. Code
23MCE1C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Computer Science

OBJECT ORIENTED ANALYSIS AND DESIGN

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. List two object modeling techniques.

2. What is meant by abstract class?

3. Define the terms event and state.

4. List the names of symbols used in data flow diagram.

5. What is meant by interating the analysis?

6. What is data store?

7. Define the term concurrency.

8. What is meant by boundary condition?

9. Define the term object.

10. Define the term inheritance.

Part B (5 × 5 = 25)

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

11. (a) Explain link and association concepts.

Or

(b) Write short notes on meta data and candidate keys.

12. (a) With an example, explain a nested state diagram.

Or

(b) Describe a simple functional model.

13. (a) Write short notes on dynamic modeling.

Or

(b) Give an overview of object oriented analysis.

14. (a) What is object oriented design? Explain briefly.

Or

(b) How subsystems are allocated to processes and tasks? Explain.

15. (a) Give a brief account on design optimization.

Or

(b) Explain how associations are designed.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain advanced object modeling techniques.

17. Explain advanced dynamic modeling concepts.

18. Explain object oriented design and analysis of ATM.

19. Describe the architecture and design of ATM system.

20. Explain in detail about object design model.

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S–4178

Sub. Code
23MCE1C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Computer Science

PYTHON PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. How do you write comments in python program? Give an example.

2. Write examples for strings in Python.

3. Name the collection data types in Python.

4. What is higher order function?

5. Define the term Class in Python.

6. Define the term object in Python. How do you declare it?

7. What is meant by Data Schema in Django?

8. State the purpose of Django.

9. What is meant by queryset?

10. Write the meaning of the term Detailed view.

Part B (5 × 5 = 25)

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

11. (a) Explain selection statements in Python.

Or

(b) Describe the numeric data types in Python.

12. (a) Explain string handling functions in Python.

Or

(b) Write and explain the working of a recursive function.

13. (a) How do you build a new data structure? Explain.

Or

(b) Write a simple GUI-based program to calculate factorial of a given number.

14. (a) Write steps in building an application in Django.

Or

(b) How subsystems are allocated to processes and tasks? Explain.

15. (a) How do you retrieve objects using Queryset Managers?

Or

(b) Explain how detailed views are created in Django.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the loops in Python. Illustrate with examples.

17. Explain in detail about creation and use of Lists and Dictionaries.

18. How do you structure classes with inheritance and polymorphism? Give examples.

19. Explain the steps in creating an administration site for models.

20. Explain in detail about building lists and detail views.

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S–4179

Sub. Code
23MCE1E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Computer Science

Elective – ADVANCED SOFTWARE ENGINEERING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. State the term of software project.
2. What do you meant by software engineering?
3. Define the term structured analysis.
4. What is called data dictionary?
5. Mention the term in cost estimation.
6. Write short note on personal planning.
7. State the use of coupling.
8. Define the term encapsulation.
9. What do you mean by test plan?
10. Define the term mutation testing.

Part B (5 × 5 = 25)

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

11. (a) Briefly explain on the prototyping model.

Or

(b) Write short note on step in a development.

12. (a) Explain the concept of formal system specification.

Or

(b) Discuss in detail about requirement process in SRS.

13. (a) Briefly the concept of on size estimation.

Or

(b) What is project scheduling? Explain in detail.

14. (a) Explain the concept of design notation and specification.

Or

(b) Describe the concept of OOA and OOD.

15. (a) Explain the issues in testing classes.

Or

(b) Discuss the concept of control flow based criteria in structural testing.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the characteristics of a software process.

17. Discuss the concept of requirement analysis.

18. Discuss the classification of risks in a project.

19. Explain the concept of functional modules.

20. Define the term testing. Briefly explain the maintenance process.

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S–4180	Sub. Code
	23MCE1E2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Computer Science

Elective – EMBEDDED SYSTEMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write the purpose of serial port.

2. State the uses of external memory.

3. What is the use of JUMP instruction?

4. What is the use of CALL instruction?

5. What is RTOS-task?

6. Define the term message queue.

7. Define the term semaphore.

8. Expand the terms RTL and QNX.

9. Name any two embedded software development tools.

10. What is the purpose of instruction set simulator?

Part B (5 × 5 = 25)

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

11. (a) Explain the working principle of counters.

Or

(b) Explain the working principle of timer.

12. (a) Explain about keyboard interface.

Or

(b) Explain about display interface.

13. (a) Explain how interprocess communication take place in RTOS.

Or

(b) Write short notes on mail boxes and pipes.

14. (a) Describe the scheduling process in RTOS.

Or

(b) What are the measures to consider to save memory space and power in RTOS based embedded system?

15. (a) How an embedded software is deployed to target systems? Explain briefly.

Or

(b) Debugging Techniques – Discuss.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Describe the architecture of 8051 Microcontroller.

17. Explain in detail about instruction sets and addressing modes.

18. Explain the operating system services RTOS.

19. Describe the basic design of RTOS.

20. Explain in detail about embedded system software development tools.

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S–4181

Sub. Code
23MCE2C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Computer Science

DATA MINING AND DATA WAREHOUSING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Mention the different repositories on which mining can be performed.

2. Mention the basic properties of the standard deviation.

3. What do you meant by non volatile data?

4. Mention the three tiers of data warehouse.

5. Mention the two step process of Association rule mining.

6. List the criteria to evaluate classification methods.

7. What is density based cluster?

8. What is an outlier?

9. Mention the types of measures in a spatial data cube.

10. What do you meant by phishing web page?

Part B (5 × 5 = 25)

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

11. (a) What motivated Data mining? Explain.

Or

(b) Specify the data mining primitives.

12. (a) Differentiate operational data systems and data warehouse.

Or

(b) Draw and explain an integrated QLAM and OLAP architecture.

13. (a) Explain support and variance with example.

Or

(b) Give an account on "classification by back propagation".

14. (a) Write the algorithm of K-means.

Or

(b) How clustering performed with Rock?

15. (a) Explain the basic measures for text retrievel.

Or

(b) Give an account on web log 'who is' server.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss the basic methods of data cleaning.

17. Exemplify indexing OLAP data.

18. Demonstrate mining frequent item sets without candidate generation.

19. Discuss the types of data in cluster analysis shortly.

20. How to mining the web's link structure to identify authoritative web pages?

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S–4182

Sub. Code
23MCE2C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Computer Science

PRINCIPLES OF COMPILER DESIGN

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Section A (10 × 2 = 20)

Answer **all** the questions.

1. Differentiate between compliers and translators

2. What is finite automata?

3. What is LR in LR parser?

4. List out parsing techniques.

5. Draw Syntax Tree for the expression a + b * c – d.

6. What is meant by 3-address code in compiler design?

7. State the purpose of symbol table.

8. What is meant by semantic error?

9. Write any two sources of optimization in compiler design.

10. What is meant by object code?

Section B (5 × 5 = 25)

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

11. (a) Explain briefly about Error handling.

Or

(b) Write short notes on regular expressions.

12. (a) How predictive parser works? Explain briefly.

Or

(b) How to construct LALR parsing table?

13. (a) Brief on Intermediate code.

Or

(b) With an example, explain translation of source code by top down parser.

14. (a) Write short notes on simple stack allocation scheme.

Or

(b) Elaborate on Data structures used in symbol table.

15. (a) Analyze the Principle sources of optimization.

Or

(b) Express Problems encountered in code generation.

Section C (3 × 10 = 30)

Answer any **three** questions.

16. With an example, illustrate NFA to DFA conversion.

17. Explain in detail about operator precedence parsing.

18. Describe Syntax-directed translation.

19. How to recover from errors? Explain in detail.

20. Explain code generation phase of a compiler.

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S–4183

Sub. Code
23MCE2C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Computer Science

ADVANCED JAVA PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Section A (10 × 2 = 20)

Answer **all** the questions.

1. What is a Thread?

2. Define : Java Media Framework.

3. What is the purpose of the java.rmi.Remote interface?

4. What is meant by binding in RMI?

5. What is the role of DriverManager in JDBC?

6. Difference between execute( ). exeeuteQuerv( ) methods.

7. What is the difference between doGet( ) and doPost( )?

8. Define : URL Encoding.

9. What is Internationalization in Java?

10. Difference between a Window and a Frame.

Section B (5 × 5 = 25)

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

11. (a) How can you synchronize threads in Java? Explain.

Or

(b) Discuss the purpose of the InetAddress class in Java.

12. (a) Difference between RMI and local method invocation in Java.

Or

(b) Difference between RMI and socket programming in Java.

13. (a) Discuss the various types of JDBC drivers available in Java.

Or

(b) Describe the basic steps involved in connecting to a database using JDBC.

14. (a) Difference between servlets and JSP.

Or

(b) Write in detail about JSP implicit objects.

15. (a) Explain the difference between internationalization and localization in Java.

Or

(b) Explain how you can handle events in Java Suing.

Section C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Describe the steps involved in creating a UDP server and client in Java.

17. Explain the role of serialization in RMI.

18. Write a Java program to store the student mark details.

19. Explain JSP directives with an example.

20. Discuss the layout managers in Java Swing and provide examples of their usage.

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S–4184

Sub. Code
23MCE2E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Computer Science

Elective — ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is Artificial Intelligence?

2. What production system consists of?

3. Use of Heuristic Search.

4. Differentiate simple hill Climbing and Steepest Hill climbing.

5. Define resolution procedure.

6. What is control knowledge in AI?

7. Define Bigdata.

8. What is statistical Machine Learning?

9. What is data preparation for machine learning?

10. List out any four machine learning applications.

Part B (5 × 5 = 25)

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

11. (a) Explain briefly the various problem characteristics.

Or

(b) Explain the issues in design of search.

12. (a) Discuss the memory bounded heuristic search.

Or

(b) Explain the approaches knowledge representation.

13. (a) Discuss the importance of isa and instance of knowledge representation with example.

Or

(b) Compare and contrast forward and backward reasoning in AI.

14. (a) Discuss in detail about big data in context with machine learning.

Or

(b) Justify the necessity for dimensionality reduction in the context of machine learning.

15. (a) Explain the applications of machine learning in industry.

Or

(b) Discuss the data preprocessing techniques in machine learning.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Enumerate Classical "Water jug Problem. Describe the state space for this problem and also give the solution.

17. Explain the various problem solving and problem reduction methods with algorithm and example.

18. Illustrate the use of predicate logic to represent the knowledge with suitable example.

19. Explain the leverage power of machine learning techniques with example.

20. Explain the impact of machine learning on applications in detail.

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S–4185

Sub. Code
23MCE2E2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Computer Science

Elective — BLOCK CHAIN TECHNOLOGIES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Section A (10 × 2 = 20)

Answer **all** the questions.

1. What is bitcoin?

2. Write the meaning of the term block chain regulators.

3. What is meant by distributed database?

4. Define the term block chain network.

5. What is called cryptography?

6. State the uses of digital signatures.

7. What is called block market?

8. Mention the term global economy.

9. Write short note on data management.

10. What is block chain property?

Section B (5 × 5 = 25)

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

11. (a) Brief the benefits of using block chain applications.

Or

(b) Comparison between bitcoin versus crypto currencies.

12. (a) How mining mechanism facilitates block chain? Explain its use.

Or

(b) Explain the merits and demerits of block chain 2.0.

13. (a) Illustrate the concept of symmetric key cryptography.

Or

(b) Explain the benefits of high and low trust societies.

14. (a) What is roots of bitcoin? Explain with illustrations.

Or

(b) Explain the concept of legal views of bitcoin.

15. (a) Write a short note on healthcare quality.

Or

(b) How will you using healthcare data? Explain its use.

Section C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss in detail about the big picture behind block chain industry.

17. What are the issues associated with block chain? Explain with illustrations.

18. What is trust model in cryptography? Comparison between leviathan and intermediary models.

19. Explain in detail about the exchange of crypto currency.

20. Discuss in detail about the challenges and features of block chain.

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S–4186

Sub. Code
23MCE3C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Computer Science

DIGITAL IMAGE PROCESSING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

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

Answer **all** questions.

1. List out the two fields that commonly use digital image processing.

2. Define quantization.

3. Define histogram.

4. List out the gray level transformations types.

5. What is the main goal of image restoration?

6. What is inverse filtering used for in image restoration?

7. What is image compression?

8. Define lossy compression.

9. Define edge detection.

10. What is meant by region based segmentation?

Part B (5 × 5 = 25)

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

11. (a) What is the significance of image sampling?

Or

(b) Briefly explain the process of image sensing.

12. (a) Write a short notes on importance of image enhancement.

Or

(b) Briefly explain the concept of spatial filtering and its applications.

13. (a) Write a short note on restoration process and its components.

Or

(b) Briefly explain the role of geometric transformations.

14. (a) Briefly explain the need for compressing digital images.

Or

(b) Write a short notes on compression standard and applications.

15. (a) Write a short notes on applications of thresholding.

Or

(b) Briefly explain boundary detection in image segmentation.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss the various linear and non linear operations in digital image processing with example.

17. Explain the working principles of smoothing and sharpening spatial filter with examples.

18. Describe the process of periodic noise reduction using linear filtering techniques.

19. Describe the difference between lossless and lossy compression with example.

20. Explain the process of edge detection and its importance in image segmentation.

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S–4187

Sub. Code
23MCE3C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Computer Science

CLOUD COMPUTING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the primary goal of cloud computing?

2. Define cloud computing.

3. What does “Computing for everyone” mean?

4. List one benefit of cloud computing for communities.

5. What are cloud services?

6. Define project management.

7. What is the key feature of web mail services?

8. Name two popular web conferencing tool.

9. Define cloud storage.

10. What is a web based desktop?

Part B (5 × 5 = 25)

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

11. (a) Discuss the various benefits of cloud computing for businesses.

Or

(b) What are the key factors to consider when developing cloud computing services?

12. (a) Explain the concept of centralizing email communication and its advantages.

Or

(b) How can cloud computing facilitate presenting on the road for professionals?

13. (a) Discuss the advantages of cloud based event management tools.

Or

(b) Describe how cloud services can improve project management.

14. (a) Compare two popular web mail services based on their features.

Or

(b) Evaluate the features of a web conferencing tool of your choice.

15. (a) Compare the features of two online photo editing applications.

Or

(b) Compare two popular online file storage services based on their features and storage capacity.

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

Answer any **three** questions.

16. Analyze the pros and cons of cloud computing with relevant examples.

17. Describe in detail the various cloud computing solutions available for managing projects, including their features and benefits.

18. Analyze the benefits and challenges of using cloud services for managing calendars, schedules and tasks.

19. Explain the role of blogs and wikis in enhancing collaborative learning and knowledge sharing with examples.

20. Describe the various functionalities and benefits of online book marking service with examples.

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S–4188

Sub. Code
23MCE3C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Computer Science

DATA SCIENCE AND ANALYTICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Big Data.

2. What is the difference between structured and unstructured data?

3. What is the primary goal of machine learning?

4. Define supervised learning.

5. What is R and why is it used in data analytics?

6. How do you import a CSV file in R?

7. Define a Naïve Bayes classifier.

8. How do you evaluate a decision free model?

9. What is linear regression?

10. Define “Inverse document frequency”.

Part B (5 × 5 = 25)

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

11. (a) Describe the role of data scientist in a big data project.

Or

(b) Explain the importance of data cleaning in the data science process.

12. (a) Explain the difference between descriptive and predictive analytics.

Or

(b) How does unsupervised learning differ from supervised learning?

13. (a) Explain the difference between data import and data export in R.

Or

(b) Compare and contrast data exploration and data presentation.

14. (a) Describe the key components of a decision tree algorithm.

Or

(b) Discuss the advantages and disadvantages of using decision trees for classification.

15. (a) What are the challenges associated with text analysis?

Or

(b) Explain the process of representing text data for machine learning.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss the various stages of the data science process with relevant examples.

17. Describe the data analytics life cycle in detail with example of each phase.

18. Discuss various R graphical user interfaces and their features.

19. Explain Bayes' theorem and demonstrate how the Naïve Bayes classifier uses it for classification, providing a practical example.

20. Describe the process of building and evaluating a linear regression model.

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S–4189

Sub. Code
23MCE3E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Computer Science

Elective : NETWORK SECURITY AND CRYPTOGRAPHY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Crypt analysis.
2. Define diffusion and confusion.
3. What is message authentication?
4. Differentiate MAC and Hash function.
5. Define Kerberos.
6. What is S/MIME?
7. What is behavior blocking software?
8. What is worm?
9. What is security audit?
10. Define steganography.

Part B (5 × 5 = 25)

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

11. (a) Briefly explain the classical encryption technique with symmetric cipher model.

Or

(b) Explain the design principles of block cipher.

12. (a) Discuss about the key management of public key encryption in detail.

Or

(b) Enumerate the Idea behind elliptic curve cryptosystems.

13. (a) Explain the format of X.509 certificate.

Or

(b) Write a brief note on E-mail security.

14. (a) Elucidate about SSL/TLS protocol.

Or

(b) What is firewall? Discuss about its types.

15. (a) Elucidate about quantum cryptography.

Or

(b) Enumerate about the features of water marking.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Enumerate in detail the key generation in AES algorithm.

17. Explain RSA algorithm in detail with example.

18. Discuss about the operational description of PGP.

19. Elucidate source electronic transaction with neat diagram.

20. Enumerate about DNA cryptography.

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S–4190	Sub. Code
	23MCE3E2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Computer Science

Elective – ADVANCED INTERNET OF THINGS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define the IoT.

2. Mention the security challenges in IoT.

3. What is a microcontroller?

4. List two components commonly used in IoT devices.

5. How do you install and setup the Arduino IDE on your computer?

6. What is the purpose of the setup( ) and loop ( ) function in Arduino?

7. Define actuator.

8. What is the difference between analog and digital sensor?

9. What is the Arduino IDE used for?

10. What is the purpose of sending sensor data over the internet?

Part B (5 × 5 = 25)

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

11. (a) Describe the main components of IoT architecture.

Or

(b) Discuss the important of security in IoT.

12. (a) Describe the difference between A/C and D/C current.

Or

(b) Explain the components of multipurpose computer.

13. (a) How do you use the serial begin( ) and serial.print( ) function to display data on the serial monitor?

Or

(b) Write a program that reads a sensor value and prints it to the serial monitor. Explain each step.

14. (a) Explain the working principle of a temperature sensor.

Or

(b) Describe the process of interfacing an ultrasound sensor with Arduino.

15. (a) How to transmit data from temperature sensor to open source IoT cloud platform?

Or

(b) Explain briefly about programming NODEMCU using Arduino IDE.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Analyze the various applications of IoT in the health care industry and their impact on patient care.

17. Explain the generation of PWM signals using micro controller and their applications in various fields.

18. Describe the importance of the Arduino library functions for various operations.

19. Explain in detail the interfacing of an ultrasound sensor with Arduino.

20. Explain the process of using ESP 8266 NODEMCU WIFI module in sounding data over interrupt.

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