S–3014

Sub. Code
23BAI1C1

B.Sc. DEGREE EXAMINATION, APRIL 2026

First Semester

Artificial Intelligence

PROGRAMMING FOR PROBLEM SOLVING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is a program?

2. Define continuous data.

3. What do you mean by a keyword?

4. Write down the logical operators in 'C'.

5. Provide a definition of a two dimensional array.

6. Show an example of defining an array.

7. How will you declare a function in C?

8. Give an example of declaring a variable in a 'C' function?

9. Write the general form of a 'C' structure.

10. What does a pointer store internally?

Part B (5 × 5 = 25)

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

11. (a) Discuss about computer software.

Or

(b) Write a note on types of programming languages.

12. (a) With suitable examples, explain constants in 'C'.

Or

(b) How will you declare variables in 'C?

13. (a) Provide a note on searching algorithms.

Or

(b) Write a 'C' program for linear sort.

14. (a) Bring out a study on defining a function in 'C'.

Or

(b) Explain call by value in 'C'.

15. (a) Create a pointer in 'C'.

Or

(b) How will you access the members of a structure in 'C'?

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain the steps involved in developing a 'C' program with an example.

17. Define in detail with examples, conditional operators in 'C'.

18. With programming examples, explain string manipulation in 'C'.

19. How does recursion works? Explain in detail with code examples.

20. Use a program to explain the entire aspects of a structure in 'C'.

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S–3017	Sub. Code
	23BAI2C1

B.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Artificial Intelligence

PYTHON PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define a variable and give one example of an assignment statement in Python.

2. What will be the result of the following expression?

   a = 10

   b = 3

   print(a/b, a//b)

3. What is the purpose of the math module in Python? Give one example.

4. What does short-circuit evaluation mean in Python?

5. What will be the output of the following code?

   text = “Python”

   print(text[2])

6. Which function is used to open a file in Python? Write its syntax.

7. What is the difference between a list and a tuple in Python?

8. Show the difference between aliasing and copying a list?

9. Differentiate between a class and an object.

10. What is polymorphism in object-oriented programming?

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

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

11. (a) Describe the process of editing, saving and running a Python script using a text editor and the command line include an example of a simple script.

Or

(b) Differentiate between string concatenation and escape sequences with suitable examples.

12. (a) Elaborate the Python function that takes two numbers as parameters and returns their product by using the Call function from the main module and print the result.

Or

(b) Differentiate between for loop and while loop with suitable examples.

13. (a) Differentiate between read() and readline() when working with text files in Python?

Or

(b) Describe the process of accessing and manipulating directories in Python using the OS module.

14. (a) Explain with examples how parameters, arguments, and the return statement work in Python functions.

Or

(b) Write a short notes on Accessing Values, Removing Keys and Traversing a Dictionary with example.

15. (a) Describe the concept of problem solving using top-down design with an example.

Or

(b) Describe a short notes on objects and classes? Explain their relationship with example.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Write a detailed note on expressions in Python and arithmetic expressions, type conversions and operator precedence with examples.

17. Explain in detail the difference between one-way selection and two-way selection (if-else) with suitable examples.

18. Explain in detail how string methods like find(), replace(), split() and join() are used in Python and provide suitable examples for each.

19. Discuss in detail List methods for Inserting and Removing Elements, Searching and Sorting a List wand explain with example for each.

20. Write a detailed notes in Python with examples:

(a) Objects and data modeling.

(b) Structuring classes.

(c) The role of inheritance and polymorphism in reducing redundancy.

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S–3018	Sub. Code 23BAI2S1

B.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Artificial Intelligence

INTRODUCTION TO HTML

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is Internet?

2. What is meant by a web page?

3. Define block-level elements.

4. What is the use of the tag?

5. Define ordered list.

6. What is the <hr> tag?

7. What is a table caption?

8. Define cell padding.

9. What is frameset?

10. What is the use of <textarea> in a form?

Part B (5 × 5 = 25)

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

11. (a) Describe the concept of web browsers with suitable examples.

Or

(b) Explain HTML basics and tags.

12. (a) Explain HTML headings and paragraph tag with examples.

Or

(b) Discuss the different font style elements used in HTML.

13. (a) Illustrate the nested list with examples.

Or

(b) Demonstrate the use of the marquee tag and image insertion in HTML.

14. (a) Explain the process of table creation and the various table elements in HTML.

Or

(b) Explain and apply table alignment and the use of the colspan attribute with examples.

15. (a) Explain frames and noframe.

Or

(b) Illustrate form elements with special reference to input and option tags.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain Internet, web pages, web browsers and structure of HTML document.

17. Elaborate the HTML document structure and block-level text elements with examples.

18. Explain and demonstrate the use of lists, hyperlinks, images in HTML.

19. Construct and analyze HTML tables with suitable examples using rowspan and colspan attributes.

20. Illustrate frames and forms in HTML with examples.

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S–3019	Sub. Code
	23BAI2S2

B.Sc. DEGREE EXAMINATION, APRIL 2026

Second Semester

Artificial Intelligence

MULTIMEDIA SYSTEMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define Multimedia.

2. What is ASCII in computers and text representation?

3. Give two examples of color image file formats.

4. What is MIDI?

5. Define digital audio.

6. Mention one way to add sound to a multimedia project.

7. Define “Keyframes’ in computer animation.

8. Mention any two principles of animation.

9. Give two examples of intangible needs in multimedia development.

10. Who are the members of a multimedia production team?

Part B (5 × 5 = 25)

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

11. (a) Describe different categories of fonts with examples.

Or

(b) List and explain any four font editing and design tools.

12. (a) Describe the process of planning and approaching the creation of still images for multimedia projects.

Or

(b) Compare digital audio and MIDI audio in terms of their creation, storage and application in multimedia.

13. (a) Write a short note on multimedia system sounds with examples.

Or

(b) List and explain the steps for adding sound to a multimedia project.

14. (a) Illustrate the principle of timing in animation.

Or

(b) Classify the key factors to consider when choosing a digital video container for a project?

15. (a) Discover the importance of intangible needs in a multimedia project.

Or

(b) Write a short note on authoring systems in multimedia.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail the role of text in multimedia, including fonts, faces and computer representation.

17. Compare MIDI audio and digital audio in terms of structure, storage, quality and applications.

18. Compare different audio file formats (WAV, MP3, AAC, MIDI, etc.) with their advantages and limitations.

19. Elaborate in detail the 12 principles of animation and their significance in creating effective animations.

20. Discuss in detail the stages of a multimedia project with examples.

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S–3020	Sub. Code
	23BAI3C1

B.Sc. DEGREE EXAMINATION, APRIL 2026

Third Semester

Artificial Intelligence

OBJECT ORIENTED PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define recursion.

2. What is the use of the return statement in a function?

3. Label the purpose of the super keyword in Java?

4. What is an interface in Java?

5. What is an exception in Java?

6. Define multi-threading.

7. How do you write output to the console in Java?

8. What is a bounded type in Java generics?

9. What is the first phase of the software development process?

10. Give one example of a Swing user interface element.

Part B (5 × 5 = 25)

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

11. (a) Describe arrays in Java including declaration and initialization.

Or

(b) Describe the concept of scope and storage class in Java with examples.

12. (a) Describe the difference between nested classes and inner classes.

Or

(b) Explain the use of the super keyword with an example.

13. (a) Write short notes on uncaught exceptions.

Or

(b) Explain the steps for creating a thread in Java.

14. (a) Describe the process of reading console input and writing console output with example.

Or

(b) Describe bounded types in Java generics and their significance.

15. (a) Explain the Iterator pattern and its use in Java with an example.

Or

(b) Explain the key phases of the software development process.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Elaborate on the use of operators and control statements in Java including examples of arithmetic, relational and looping constructs with suitable examples.

17. Discuss inheritance in Java in detail including member access, method overriding, and dynamic method dispatch with examples.

18. Elaborate on exception handling in Java including try-catch, throw, throws, finally and handling uncaught exceptions with an example.

19. Discuss in detail the file handling mechanisms in Java, including reading and writing files with examples.

20. Explain Swing programming in Java, including event handling, UI elements and painting with examples.

S–3024	Sub. Code 23BAI4C1

B.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Artificial Intelligence

R PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define a vector in R.

2. How do you install a package in R?

3. How do you access elements from a list in R?

4. What is a scalar in R?

5. What is a data frame in R?

6. How do you create an empty list in R?

7. What is a contingency table in R?

8. Define cumulative sum and which R function is used to compute it?

9. Define a generic function in R.

10. Name any two commonly used functions for data visualization in R.

Part B (5 × 5 = 25)

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

11. (a) Explain different data types in R with give one example for each.

Or

(b) What are logical operations in R? Explain with truth tables and code example.

12. (a) What are scoping rules in R? Differentiate between lexical and dynamic scoping.

Or

(b) Explain how logical subscripting works in vectors with code example.

13. (a) What are the different ways to index a list in R? Explain with examples.

Or

(b) Describe the structure of a data frame and how to access rows and columns with examples,

14. (a) Explain how to create and manipulate a table in R using table() and margin.table().

Or

(b) Explain the use of cumsum() and cumprod() functions in R with examples.

15. (a) Explain the structure of an S3 class and how it is created in R.

Or

(b) Describe the process of statistical analysis in R using built-in functions.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the essential features of the R language and discuss its advantages in data analysis.

17. Explain various control structures in R (if, else, for, while, repeat, break, next) with a code examples.

18. Discuss with a code examples how lists differ from vectors, matrices, and data frames in R.

19. Explain mathematical functions in R such as sum(), prod(), min(), max(), mean() and their applications in data analysis and include examples using both vectors and tables.

20. Discuss the concept of generic functions and method dispatch in R with a code examples.

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S–3025

Sub. Code
23BAI4S1

B.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Artificial Intelligence

QUANTITATIVE APTITUDE

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Least common multiple.

2. Find the HCF of 6 and 18.

3. Is the ratio 5:10 proportional to 1:2?

4. What is the formula for profit and loss?

5. X completes 1/15 part of a certain job in 1 day. In how many days, X will complete the full job?

6. 9 pumps working 8 hours a day can empty a reservoir in 20 days. How many such pumps needed to empty the same reservoir working 6 hours a day in 16 days?

7. In how many ways, can we select a team of 4 students from a given choice of 15?

8. Find the odd man out with proper reason 1, 8, 27, 64, 81, 125.

9. Today (05-05-2025) is Monday. In 96 days, what day will it be?

10. How many times in a day the two hands of a clock coincide?

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

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

11. (a) The average of 50 numbers is 20. If two numbers 37 and 43 are discarded, find the average of the remaining numbers?

Or

(b) How are square roots of perfect squares calculated using the prime factorisation method? Show with an example.

12. (a) A father is currently three times as old as his son. Five years ago, he was four times as old as his son. Find the current ages of the father and the son.

Or

(b) A man sold two watches at the same price, one at a 10 % profit and the other at a 10 % loss. Find his overall gain or loss percentage using long method?

13. (a) A cistern has two pipes. Both working together can fill the cistern in 12 minutes. First pipe is 10 minutes faster than the second pipe. How much time would it take to fill the cistern if only second pipe is used?

Or

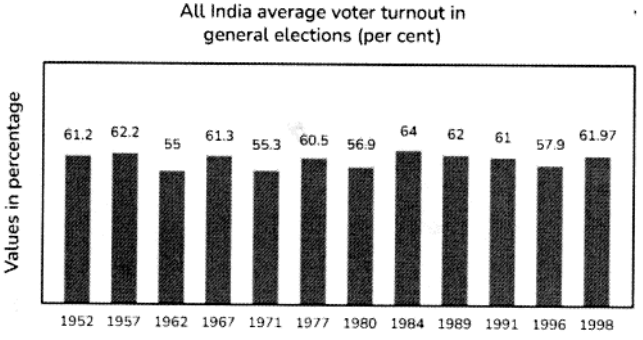
(b) Two trains 180 m and 120 m long respectively pass each other in 54 seconds when they run in the same direction and in 18 seconds when run in opposite directions. Find the speed of two trains?

14. (a) Find the true discount on a bill of \$2,000 due in 9 months at an annual rate of 8%.

Or

(b) The shadow of a tree decreases by 15 m when the sun's altitude changes from 45° to 60°. Find the length of the tree.

15. (a) Study the following graph and answer the questions carefully.



(i) In which of the years, the numeric difference in voters turnout (in percentage) was nearly equal to 5%?

(ii) Average voter turnout (in percentage) between 1952 to 1998 was approximately?

(iii) In which year was the growth in the average voter turnout (in percentage) to be the second highest in comparison to the previous elections?

Or

(b) At what time between 12 PM and 1 PM would the two hands of the clock be together?

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Find the cube root of 2744 by using prime factorization and long division methods.

17. The ages of A, B and C together is 65 years. B is 2/3 of A and C is 9 years older than A. Then, what is the ratio of the respective age of C, A and B?

18. A sum of money placed at compound interest doubles itself in 3 years. In how many years will it amount to 8 times itself?

19. What is the present value, true discount, banker's discount and banker's gain on a bill of 2,00,000 due in 1 year at a% rate of interest of 10% per annum.

20. For a science camp, students from different states have enrolled. Construct a pie chart for the given table.

States	Number of Students
Tamilnadu	10
Kerala	5
Karnataka	5
Maharashtra	10
Andhra	10

S–3026

Sub. Code
23BAI4S2

B.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Artificial Intelligence

INTRODUCTION TO DATA COMMUNICATION AND NETWORKING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the role of a protocol in data communication?

2. Define network topology.

3. How is error controlled in datalink controlled protocol?

4. What is meant by flow control?

5. Define Token passing.

6. Write any two advantages of code division multiple access.

7. What is an internet protocol?

8. How does a router differ from a bridge?

9. Mention the four groups of HTTP header.

10. What is a post office protocol?

Part B (5 × 5 = 25)

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

11. (a) What are the three types of signals transmitted through unguided media? Explain.

Or

(b) List out the principles involved in the transmission of data through optical fibers.

12. (a) Briefly explain any two redundancy checks used in data communications.

Or

(b) Give a brief note on Hamming code.

13. (a) Enlighten the features of multiple access protocols.

Or

(b) Write short notes on CSMA access modes.

14. (a) Show the advantages and disadvantages of UDP.

Or

(b) List the characteristics of IPv4.

15. (a) How does DNS work? Explain.

Or

(b) Briefly explain the services provided by E-mail system.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe the functions of the layers in the OSI reference model.

17. Illustrate the Go-Back-N ARQ sliding window protocol.

18. Distinguish FDMA, TDMA and CDMA.

19. Explain the features and working principle of transmission control protocol.

20. How does FTP work? Explain with neat diagram.

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S–3034

Sub. Code
23BAI6C1

B.Sc. DEGREE EXAMINATION, APRIL 2026

Sixth Semester

Artificial Intelligence

DEEP LEARNING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Which network mimic complex human brain functions?

2. State the capabilities of neural networks.

3. Can deep learning autonomously uncover patterns?

4. Write any two disadvantages of deep learning.

5. To extract features from grid-like matrix datasets, which technique do we use?

6. Define convolution.

7. How does RNN process information?

8. Provide the function of overall function in RNN.

9. What is object detection and recognition?

10. Define natural language processing.

Part B (5 × 5 = 25)

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

11. (a) List the process of learning in neural networks.

Or

(b) Discuss about adaptive learning.

12. (a) How deep earning works? Explain.

Or

(b) Provide the role of AI in deep learning.

13. (a) Explain the working of activation layer in CNN.

Or

(b) Write a note on AlexNet.

14. (a) Express briefly RNN unfolding.

Or

(b) How is hidden state calculated in RNN?

15. (a) Provide a brief note on computer vision.

Or

(b) Discuss about gathering image captions.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Bring out a detailed study on training a neural network.

17. Elaborate on the applications of deep learning applications in detail.

18. Elucidate on training of Convolutional Neural Network (CNN) in TensorFlow in detail.

19. Discuss in detail deep reinforcement learning.

20. Describe sentiment analysis in detail.

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S–3035

Sub. Code
23BAI6C2

B.Sc. DEGREE EXAMINATION, APRIL 2026

Sixth Semester

Artificial Intelligence

COMPUTER VISION

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is 2D sampling?

2. Which quantizing does analog signals use?

3. How will you identify distinctive structures within an image?

4. Write about Harris Corner detector.

5. Provide the work of image segmentation.

6. Define shape representation.

7. What does motion tell us?

8. Show the other name of optical computing.

9. Does automated visual inspection systems detect deformities?

10. Expand ADAS and define.

Part B (5 × 5 = 25)

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

11. (a) Write a note on optical systems.

Or

(b) Explain about orthographic projection.

12. (a) Why dimensionality reduction in Image Processing Important?

Or

(b) Discuss about Sobel, Prewitt and Roberts Operators.

13. (a) Describe about semantic segmentation.

Or

(b) Briefly explain the Fourier descriptor.

14. (a) Define stereo vision briefly.

Or

(b) How will you explain optical flow?

15. (a) In what way does automatic visual inspection systems work?

Or

(b) Write a note on CBIR.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Bring out a detailed study on auto-caliberation.

17. Elaborate on Phong model in detail.

18. Elucidate on the Edge based approaches to segmentation in detail.

19. Describe in detail motion parameter estimation.

20. Discuss activity recognition in detail.

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S–3036

Sub. Code
23BAI6E1

B.Sc. DEGREE EXAMINATION, APRIL 2026

Sixth Semester

Artificial Intelligence

Elective – ROBOTICS AND ITS APPLICATIONS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Who is Isaac Asimov?

2. How will you define robot?

3. Define actuators.

4. Write the purpose of sensors.

5. Provide the definition of localization in robotics.

6. What is pose estimation?

7. How does path planning help in robotics?

8. What do you mean by ‘roadmap?

9. Is ariel robots considered as drones?

10. Where are ‘orbiters’ used?

Part B (5 × 5 = 25)

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

11. (a) Provide a brief history about robots.

Or

(b) Discuss about the components of robots.

12. (a) Write a note on the types of sensors.

Or

(b) Describe about the importance of internal sensors.

13. (a) What is SLAM? Explain.

Or

(b) Bring out the challenges of localizations.

14. (a) Write a note on roadmap construction.

Or

(b) Explain briefly on the obstacle avoidance.

15. (a) Discuss about ariel robots.

Or

(b) How are robots used in mining explorations?

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Elaborate in detail on the role of AI in Robotics.

17. Bring out a detailed study on differential wheel mobile robot.

18. Write an elaborate note on ultrasonic based localization.

19. Elaborate in detail on the working of Robotic Vision.

20. Describe the application of robots in military applications.

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S–3039

Sub. Code
23BAI6E4

B.Sc. DEGREE EXAMINATION, APRIL 2026

Sixth Semester

Artificial Intelligence

Elective – INTRODUCTION TO DATA SCIENCE

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. To find patterns in data which technique do we use?

2. Provide an example of unstructured data.

3. What do data engineers do?

4. Do we use machine learning in data science?

5. Provide any one benefit of data science.

6. Define supervised learning.

7. Write a note on open source.

8. Is Apache required for Hadoop?

9. Can data science be used in search engines?

10. Define prediction in data science.

Part B (5 × 5 = 25)

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

11. (a) By using data science what can we achieve?

Or

(b) How does a data scientist work?

12. (a) Explain the process of model deployment in data science.

Or

(b) Write a note on model building in data science.

13. (a) Provide a brief analysis of unsupervised learning in ML.

Or

(b) Discuss about linear regression.

14. (a) Describe the processing/computation layer of Hadoop.

Or

(b) How does MapReduce help in Hadoop? Explain.

15. (a) In what way data science help in predicting diseases? Discuss.

Or

(b) Discuss the method of training individual models.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Write in detail about the big data ecosystem and data science.

17. Elaborate the key components of data science process in detail.

18. Elaborate on reinforcement learning in machine learning in detail.

19. Describe in detail the working of Hadoop with examples.

20. Explain the steps involved in presentation and automation in data science.

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