

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY-JUNE, 2025

Paper Code: BCAT-214

Subject: Introduction to Artificial Intelligence

Time: 3 Hours

Maximum Marks: 60

Note: Attempt any Five questions including Q.No.1 which is compulsory. Select one question from each unit.

Q 1 Write short notes of the following:

(2x10=20)

- What is state space representation in problem solving?
- What are heuristic reasoning methods?
- What is the difference between predicate logic and propositional logic?
- What are a fuzzy set and a Membership function? What is the difference between a crisp set and a fuzzy set?
- Discuss the advantages of using context-free grammars in design of practical natural language parsers.
- Explain how an instance and IS-A relationship is represented in Artificial intelligence.
- Write various Knowledge Representation issues. Provide the solution of any of two issues.
- What is the purpose of discourse integration in Natural Language Processing?
- What is Conceptual Dependency?
- Define how prolog programming language is a good language for robot programming.

UNIT-I

- Q2 (a) Discuss the criteria for success in AI. (6)
(b) Discuss the history of artificial intelligence briefly (4)

- Q3 (a) Using constraint satisfaction procedure solves the following cryptarithmic problem: (6)

SAVE
+ MORE

MONEY

- (b) Write down the steps of breadth first search. Illustrate with example.

(4)

UNIT-II

- Q4 (a) What are the qualities of a good knowledge representation system? (5)
(b) Explain in detail about forward chaining and backward chaining with algorithms. (5)
- Q5 Discuss the expert system in domain of medicine using suitable case study? Explain its architecture describing its components. (10)

P.T.O.

P-1/2

UNIT-III

- Q6 (a) What is Bayesian reasoning? How does an expert system rank potentially true hypotheses? Give an example (4)
- (b) Discuss the syntax and semantics of propositional logic. List the rules of inference for propositional logic. Consider the following facts and construct a step-by-step proof by resolution of the statement "John likes peanuts". (6)
- John likes all kinds of food.
 - Apple and vegetable are foods.
 - Anything anyone eats and is not killed by is food.
 - Anil eats peanuts and is still alive.
 - Harry eats everything that Anil eats.
- Q7 What is Natural Language Processing? What are the steps in the process of Natural Language Processing? Discuss with an example. (10)

UNIT-IV

- Q8 (a) Explain various types of learning in problem solving. (5)
- (b) Explain learning in Decision Tree with example (5)
- Q9 (a) Explain in detail about Active and Passive Reinforcement learning. (5)
- (b) Differentiate between Deductive and Inductive learning. (5)

P-2/2

(Please write your Exam Roll No.)

Exam Roll No. 00219401023

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY-JUNE, 2025

Paper Code: BCAT-212

Subject: Introduction to Data Science

Time: 3 Hours

Maximum Marks: 60

Note: Attempt any five questions including Q.No.1 which is compulsory.
Select one question from each unit.

Q1 Write short notes of the following:

- a) What is Data Science? (2)
- b) Differentiate between Data Analytics and Data Science? (3)
- c) How is Data Science different from traditional application programming? (3)
- d) Why is Python favored over other languages for Data Science? (2)
- e) How can we handle missing data? (2)
- f) How are Data Science and Machine Learning related to each other? (2)
- g) Why we need Data Frames? Give an example? (2)
- h) How we perform indexing and slicing? Give an example? (2)
- i) Does Data Science have power to predict the future? Justify? (2)

UNIT-I

Q2 (a) What are the factors involve in increases the evolution of Data Science? (5)

(b) Discuss the applications of Data Science in various fields? (5)

Q3 (a) What are Data collection strategies? (4)

(b) Elaborate all stages of Data Pre-processing in data Science? (6)

UNIT-II

Q4 (a) Define the following terms:- (Any Three) (6)

- i) Skewness and Kurtosis,
- ii) Box plots,
- iii) pivot table,
- iv) Linear regression

(b) How central tendencies and Dispersion provides benefits to Data Science? (4)

Q5 (a) Explain two types of statistics with an example? (4)

(b) How does matplotlib and seaborn describes the functionality of stats in Data Science. (6)

UNIT-III

Q6 (a) Explain the following libraries: (Any Three) (6)

- i) Pandas,
- ii) Numpy,
- iii) Scipy,
- iv) Tensor flow

(b) Write a code to upload a CSV file by using pandas and Data Frames? (4)

UNIT-IV

Q8 a) How forecasting demand can be analyzed in data Science? (5)

b) What are different patterns in data? Elaborate with an example? (5)

P.T.O.

P-1/2
BCAT-212

[-2-]

- Q9 (a) Differentiate between categorical features and numerical feature with help of example? (4)
- (b) Perform case study on investigating clinical data by the following tasks- (6)
- (Assume values)
- Load the data
 - Feature selection the dataset
 - Censoring.

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY-JUNE, 2025

Paper Code: BCA-204

Subject: Software Engineering

Time: 3 Hours

Maximum Marks: 60

Note: Attempt any five questions including Q.No.1 which is compulsory.
Assume missing data if any. Internal choice is indicated.

Q1 Attempt any Five Questions:-

(5*4=20)

- (a) What is software crisis? Was Y2K a software crisis?
- (b) What is software engineering? Is it an art, craft or a science? Discuss
- (c) What is basic Cocomo model?
- (d) Write short note on Data dictionary.
- (e) What is System Development Life Cycle (SDLC). Explain its Phases.
- (f) What are the steps followed in testing?
- (g) What is verification and validation
- (h) Define FAST AND QFD.

- Q2 (a) Define the term "Software engineering". Explain the major differences between software engineering and other traditional engineering disciplines. (5)
- (b) What are the major phases in the water fall model and spiral model? Where is spiral model beneficial? (5)

OR

- Q3 (a) Draw a DFD for borrowing a book in a library which is explained below:
"A borrower can borrow a book if it is available else, he/she can reserve for the book if he/she so wishes. He/she can borrow a maximum of three books? (5)
- (b) What is software requirements specification (SRS)? List out the advantages of SRS standards. (5)
- List five desirable characteristics of a good SRS document. (5)
- Q4 (a) Explain the Walson & Felix model and compare with the SEL model. (5)
- (b) Suppose that a project was estimated to be 400 KLOC. Calculate the effort and development time for each of the three modes i.e., organic, semidetached and embedded. (5)

Software Project	ab	bb	cb	db
Embedded	2.4	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Organic	3.6	1.20	2.5	0.32

OR

- Q5 (a) What are various activities during software project planning? Describe any two software size estimation techniques. (5)
- (b) Compute the function point value for a project with the following information domain characteristics. (5)
- Number of user inputs = 30
- Number of user outputs = 42

P.T.O.

P-1/2

(Please write your Exam Roll No.)

Exam Roll No.

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY-JUNE, 2025

Paper Code: BCA-202

Subject: Java Programming

Time: 3 Hours

(2021 Onwards)

Maximum Marks: 60

Note: Attempt five questions in all including Q.No1 which is compulsory.
Select one question from each unit.

Q1 Answer the following:

(2x10=20)

- (a) What are the key differences between Java and C++?
- (b) Explain different types of access specifiers available in Java?
- (c) Explain the features of Java.
- (d) How Garbage Collection is achieved in Java?
- (e) State the purpose of Static block.
- (f) Explain checked and unchecked exceptions.
- (g) Explain Adapter Class.
- (h) What is the use of Super and final keyword?
- (i) Differentiate abstract class and interface.
- (j) What is the difference between int and integer.

Unit -I

- Q2 (a) What is a constructor? Write a program to show constructor overloading. (5)
(b) Write a program to show 5 string methods. What is a String Buffer class? (5)
- Q3 Explain Java architecture in brief. What are the types of applications in Java? (10)

Unit -II

- Q4 (a) What is inheritance? Write a program to show multilevel inheritance. (5)
(b) Explain the usage of interface in Java? Give an example of a class which implements interface. (5)
- Q5 (a) What is package? How to use two different packages in a Java class? Give example. (5)
(b) Explain exception handling with suitable example. Differentiate between throw and throws? (5)

Unit -III

- Q6 (a) What are the byte and character streams in file handling? (5)
(b) Write a program to read and write the content of a file in text mode. (5)
- Q7 Explain the life cycle of Thread and methods to implement thread with suitable code. (10)

Unit -IV

- Q8 (a) Create a login form using Swing Controls. (5)
(b) What are the different types of Layout Managers? (5)
- Q9 Explain the JDBC Architecture. What is JDBC Driver and Connection statement? (10)

P-1/1

(Please write your Exam Roll No.)

Exam Roll No.

END TERM EXAMINATION

SIXTH SEMESTER [BCA] MAY-JUNE, 2025

Paper Code: BCA-306

Time: 3 Hours

Subject: Internet of Things

Maximum Marks: 75

Note: Attempt all questions as directed. Internal choice is indicated.

- Q1 Attempt **any Five** of the following questions: (5×5=25)
- What are the sources of IoT?
 - Explain the technology behind IoT.
 - Differentiate between CoAP and MQTT.
 - What are sensors? Classify the sensors based on input, output and data types.
 - Define Actuators. Specify the types of actuators with their advantages and disadvantages.
 - Explain the architecture of basic embedded system.
 - What are the different sensor deployment strategies? Explain using examples.
 - List the components and communication technologies required to automate smart cards using IoT.
- Q2 a) Define Internet of Things. What are the visions and characteristics of IoT? (5)
- b) With the help of neat diagrams, describe the levels of IoT with an example each. (5)
- c) Differentiate between M2M and IoT. (2.5)

OR

- Q3 a) Diagrammatically explain the architectural view of IoT. Also explain the stages or layers of IoT architecture. (6.5)
- b) Explain the wired and wireless communication technologies used in IoT. (6)
- Q4 a) What is Wireless Sensing Networks(WSN). Explain the components and each layer of WSN architecture. (6.5)
- b) Write short notes on **(Any Two)**: (6)
- Arduino uno
 - Raspberry Pi
 - Beagle Bone

OR

- Q5 a) Explain the principle of RFID using neatly labelled diagram. Also specify the advantages and disadvantages of RFID in IoT applications. (6.5)
- b) Differentiate between **(Any Two)**: (6)
- Embedded Systems and IoT
 - Microcontroller and Microprocessor
 - Sensor and Smart sensor

P.T.O.

P-1/2
BCA-306

(Please write your Exam Roll No.)

Exam Roll No. 0174402022

END TERM EXAMINATION

SIXTH SEMESTER [BCA] MAY-JUNE, 2025

Paper Code: BCAT-316

Subject: IT Act and Cyber Laws

Time: 3 Hours

Maximum Marks: 75

Note: Attempt all questions as directed. Internal Choice is indicated.

Q1. Attempt any Five of the following questions. (5x5=25)

- (a) Differentiate between cybercrime and conventional crime.
- (b) Explain the concept of e-governance. How has it been implemented in India and what challenges does it face?
- (c) Define "Cyber Jurisdiction."
- (d) How is privacy protected under cyber law?
- (e) What is e-taxation?
- (f) What is reverse domain name hijacking?
- (g) Name any two cybercrimes related to IPR.

Q2. a. Explain the concept of the cyber world. How does it differ from the physical world in terms of crime, privacy, and access? (6)

b. Explain the role and importance of cyber forensics in investigating cybercrimes. What tools are used in cyber forensic analysis? (6.5)

OR

Q3. a. Discuss the various types of cybercrimes such as phishing, identity theft, cyberstalking, salami attack, and DoS attacks. Provide examples. (6)

b. Define cybercrime. Discuss the classification of cybercrimes with suitable examples. (6.5)

Q4. a. Discuss the importance of online safety, especially for women and children. (4)

b. What are the penalties and offences under the IT Act, 2000? Discuss the authorities and their powers under this Act. (8.5)

OR

Q5. a. Describe the evolution and salient features of the Information Technology Act, 2000. How does it address cybercrimes? (8.5)

b. Explain the concepts of privacy violation and data trafficking. (4)

Q6. a. Who is a Certifying Authority? What is its role in ensuring secure digital transactions in India? (6)

b. What are Cyber Tribunals and Appellate Tribunals? Explain their structure, functions, and role in resolving cyber disputes. (6.5)

OR

Q7. a. What is an e-contract? Explain the types and legal validity of e-contracts under Indian law. (6)

b. Define digital/electronic signature. How are they recognized in Indian law? Discuss the role of digital certificates. (6.5)

Q8. a. What are Cyber Tribunals and Appellate Tribunals? Explain their structure, functions, and role in resolving cyber disputes. (6.5)

P.T.O.

P-1/2

(Please write your Exam Roll No.)

Exam Roll No.

END TERM EXAMINATION

SIXTH SEMESTER [BCA] MAY-JUNE, 2025

Paper Code: BCA-302

Subject: Data Ware Housing & Mining

Time: 3 Hours

(Batch 2021 onwards)

Maximum Marks: 75

Note: Attempt any five questions in all including Q.No1 which is compulsory. Select one question from each unit.

(5x5=25)

Q1 Attempt **any Five** of the following questions:

- What is data mart? Explain types of data mart.
- Briefly explain the ETL process.
- List different components of DW.
- Explain information package diagram(IPD) with an example.
- Differentiate between MOLAP and ROLAP.
- Briefly explain what is understood by Data Mining and KDD?
- What do you mean by data transformation and data discretization?
- What is a Recommender System?

Unit-I

Q2 Explain three tier Architecture of DataWare house and How this architecture helps in better analysis of Business. (12.5)

OR

Q3 Why do big organizations and companies need a data warehouse system? Explain its compelling need and also write differences in a database system and a data warehouse system. (12.5)

Unit-II

Q4 What is Multidimensional modeling in DW and Explain star , snowflake and fact constellation Schema for multidimensional data model with their advantages and disadvantages. (12.5)

OR

Q5 What are the fundamental differences between OLAP and OLTP? What are the key operations involved in OLAP, and how do these operations facilitate efficient data analysis and decision-making in business intelligence systems? (12.5)

Unit-III

Q6 (a) Explain all Phases used for Data Preprocessing. (7.5)
(b) List Various technologies used for Data Mining and what kind of pattern can be mined. (5)

OR

Q7 Discuss Apriori Algorithm and Association Rule Mining. What are the key steps involved Min the Apriori algorithm for association rule mining, discuss with an example and how does it contribute to efficient market basket analysis? (12.5)

Unit-IV

Q8 Explain the significant role of data mining in the retail and telecommunication industries, supporting your explanation with examples from each sector. (12.5)

OR

Q9 (a) Explain the difference between classification and clustering technique, Write steps to classify the IRIS dataset. (7.5)
(b) Explain any two open source data mining tools. (5)

P

BCA-302