

Exam Code: 112905

Paper Code: 5238

Programme: Bachelor of Vocation (Artificial Intelligence and Data
Science) Semester V

Course Title: Research Methodology

Course Code: BVIL-5111

Time Allowed: 3 Hours

Max. Marks: 60

Note: Candidates are required to attempt 5 questions selecting at least one question from each section. Fifth question can be attempted from any section. Each question carries 12 marks.

Section - A

1. a) Define research and explain its purpose. Discuss the significance of ethical conduct in research. (8)
b) Differentiate between Basic Research and Applied Research with examples. (4)
2. a) Describe the purpose and importance of Action Research. (4)
b) Explain the classifications of research based on its purpose, including evaluation research. (8)

Section - B

3. a) Compare and contrast the narrative and phenomenological approaches to research. (6)
b) Describe the case study approach in research and discuss its key features. (6)
4. a) Explain the role of interviews and focus groups as data sources in qualitative research. (6)
b) Describe the process of coding in qualitative data analysis. Why is coding important? (6)

Section - C

5. Outline the typical layout of a research paper. What are the essential components? (12)

6. a) What ethical issues are associated with publishing? Describe plagiarism and self-plagiarism. (8)

b) Discuss the importance of oral presentations in research and provide key points for effective presentation. (4)

Section - D

7. a) Define intellectual property rights (IPR) and explain its importance in research. (8)

b) Describe copyright and royalty. How do they relate to academic and research work? (4)

8. a) Explain the IMRAD format used in research papers. What are its key components? (6)

b) Discuss the role of citations and acknowledgments in scholarly publishing. (6)

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Paper Code: 5239

**Programme: Bachelor of Vocation (Artificial Intelligence and Data
Science) Semester V**

Course Title: Principles of Artificial Intelligence

Course Code: BVIL-5112

Time Allowed: 3 Hours

Max. Marks: 80

Note: Candidates are required to attempt 5 questions selecting at least one question from each section. Fifth question can be attempted from any section. Each question carries 16 marks.

Section - A

1. Define Artificial Intelligence (AI) and explain its foundations and history. (16)
2. a) What are problem-solving agents? Explain their role in AI with suitable examples. (10)
b) Describe the structure of an intelligent agent. (6)

Section - B

3. Explain Breadth-First Search (BFS) and Depth-First Search (DFS) strategies with examples. (16)
4. a) Explain the concept of a knowledge-based agent. Describe its working with the Wumpus World as an example. (10)
b) What is propositional logic? (6)

Section - C

5. a) Describe the syntax and semantics of First Order Logic (FOL). How does it differ from propositional logic? (10)
b) Explain the difference between propositional and First Order inference. (6)
6. Discuss the concepts of forward chaining and backward chaining in FOL with examples. (16)

Section - D

7. a) What is uncertainty in AI? Discuss how an agent acts under uncertainty. (10)
b) Explain Bayes' Rule and its significance in probabilistic reasoning. (6)
8. a) Describe basic probability notation and inference using full joint distributions. (10)
b) Revisit the Wumpus World and explain how uncertainty is managed within it. (6)

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Paper Code: 5240

**Programme: Bachelor of Vocation (Artificial Intelligence and Data
Science) Semester V**

Course Title: Machine Learning - II

Course Code: BVIL-5113

Time Allowed: 3 Hours

Max. Marks: 80

Note: Candidates are required to attempt 5 questions selecting at least one question from each section. Fifth question can be attempted from any section. Each question carries 16 marks.

Section - A

1. Explain Thompson Sampling. (16)
2. What do you mean by Reinforcement Learning? Explain Genetic algorithm for Genetic Learning. (16)

Section - B

3. What do you mean by LDA? Explain mathematical explanation of Linear Discriminant Analysis (LDA). (16)
4. A. Explain Generalized Discriminant Analysis (GDA)? (8)
- B. Explain Low Rank Approximations. (8)

Section - C

5. A. Explain Bias and variance. (8)
- B. What is over fitting and under fitting? (8)
6. What do you mean by Feature Mapping? Explain extra tree classifier for feature selection. (16)

Section - D

7. What is tokenization? What is its significance? How is it achieved in NLP? (16)
8. What is Language Modelling and what are its challenges? Name some applications of where language modelling is used. (16)

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Paper Code: 5241

Programme: Bachelor of Vocation (Artificial Intelligence and Data
Science) Semester V

Course Title: Soft Computing

Course Code: BVIL-5114

Time Allowed: 3 Hours

Max. Marks: 80

Note: Attempt five questions, selecting one question from each section. The fifth question may be attempted from any section. Each question carries 16 marks.

(Section A)

Q1) What is soft computing? Why it is required?

Q2) Explain the need of soft computing in the field of research and prediction system.

(Section B)

Q3) What is Fuzzy Logic System? Explain its architecture in detail.

Q4) What do you mean by fuzzy relation? How two fuzzy relations are composed together? Explain with suitable examples.

(Section C)

Q5) What do you mean by ANN? How it is trained and implemented for prediction? Explain with suitable example.

Q6) Explain:-

- a) Hebbian and correlation learning rules
- b) MADALINE network

(Section D)

Q7) Explain history and working principles of Genetic Algorithms.

Q8) Explain in Genetic Algorithms:-

- a) Fitness Function
- b) Multilevel Optimization

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Paper Code: 5242

**Programme: Bachelor of Vocation (Artificial Intelligence and Data
Science) Semester V**

Course Title: Project Management

Course Code: BVIL-5115

Time Allowed: 3 Hours

Max. Marks: 60

Note: Candidates are required to attempt 5 questions selecting at least one question from each section. Fifth question can be attempted from any section. Each question carries 12 marks.

Section - A

1. (a) What is Project Management? Discuss its importance. (6)
(b) Discuss the activities covered by Software Project management. (6)
2. (a) Write a note on Waterfall model. What are its drawbacks? (6)
(b) Explain Resource Allocation in detail. (6)

Section - B

3. Explain "Management and Management control". (12)
4. What is "Project Management Life Cycle"? Explain. (12)

Section - C

5. What do you mean by "Objectives of Activity Planning"? Also discuss "Time Planner". (12)
6. Discuss various 'Network Planning Models' in detail. What is activity of arrow network? (12)

Section - D

7. (a) What do you mean by "Software Quality in Project Planning"? (6)
(b) Discuss importance of Software quality. (6)
8. (a) What do you mean by Process Capability Model? Explain. (8)
(b) What are quality plans? (4)