



Faculty of Engineering

End Semester Examination May 2025

ME3EL23 Fundamentals of AI

Programme	: B.Tech.	Branch/Specialisation	: ME
Duration	: 3 hours	Maximum Marks	: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Section 1 (Answer all question(s))

Marks CO BL
1 1 1

Q1. What is AI?

Rubric	Marks
Making a machine intelligent	1

- ☐ Putting your intelligence into computer
☒ Making a machine intelligent

☐ Playing a game
☐ Programming with your own intelligence

Q2. Which of the following is not a component of the production system?

1 1 1

Rubric	Marks
None of these	1

- ☐ Set of rules
☐ Control strategy

☐ Knowledge base
☒ None of these

Q3. What is the name of an informed search strategy?

1 1 1

Rubric	Marks
Heuristic search	1

- ☐ Simple search
☐ Online search

☒ Heuristic search
☐ None of the above

Q4. Which search is complete and optimal when $h(n)$ is consistent?

1 1 1

Rubric	Marks
Metalevel state space	1

- ☐ Best-first search
☒ Metalevel state space

☐ Depth-first search
☐ None of the mentioned

Q5. First-order logic is also known as-

1 1 1

Rubric	Marks
All of the above	1

- ☐ First-order predicate calculus
☐ Lower order calculus

☐ Quantification theory
☒ All of the above

Q6. Which is used to compute the truth of any sentence?

1 1 1

Rubric	Marks
Semantics of propositional logic	1

- ☒ Semantics of propositional logic ☐ Alpha-beta pruning
☐ First-order logic ☐ Both semantics of propositional logic and alpha-beta pruning

Q7. In which agent does the problem generator present?

1 2 1

Rubric	Marks
Learning agent	1

- ☒ Learning agent ☐ Reflex agent
☐ Observing agent ☐ None of the above

Q8. Which is used to improve the agent's performance?

1 2 1

Rubric	Marks
Learning	1

- ☒ Learning ☐ Perceiving
☐ Observing ☐ None of the above

Q9. One of the main challenges of NLP is-

1 3 1

Rubric	Marks
Handling ambiguity of sentences	1

- ☒ Handling ambiguity of sentences ☐ Handling tokenization
☐ Handling POS-tagging ☐ All of the above

Q10. The fundamental unit of the Neural network is-

1 3 1

Rubric	Marks
Neuron	1

- ☐ Brain ☐ Nucleus
☒ Neuron ☐ Axon

Section 2 (Answer all question(s))

Marks CO BL

Q11. What are the advantages and disadvantages of artificial intelligence?

4 2 1

Rubric	Marks
Advantage 2 marks Disadvantage 2 marks	4

Q12. (a) What is an intelligent agent? Explain model based intelligent agent with diagram.

6 1 1

Rubric	Marks
Definition of intelligent agent 2 marks Model based agent 2marks neat diagram 2 marks	6

(OR)

(b) Explain the concept of production systems in artificial intelligence.

Rubric	Marks
Production system 3 marks Components 3 marks	6

Section 3 (Answer all question(s))

Marks CO BL

Q13. Explain the difference between A* and AO* algorithms.

4 2 1

Rubric	Marks
Difference in points 3 marks Difference via diagram 1 mark	4

Q14. (a) What is Alpha-Beta pruning in the context of game playing? Explain with the help of a suitable game tree.

6 3 2

Rubric	Marks
Alpha-beta pruning in the context of game playing. 3 marks Explain with the help of a suitable game tree. 3 marks	6

(OR)

(b) Explain the min-max algorithm with an example.

Rubric	Marks
Minimax 3 marks Example 3 marks	6

Section 4 (Answer all question(s))

Marks CO BL

Q15. Write a short note on inferencing and its types.

4 2 1

Rubric	Marks
short note 2 marks types 2 marks	4

Q16. (a) Difference between propositional logic and first-order predicate logic.

6 1 1

Rubric	Marks
1 mark for each difference	6

(OR)

(b) What is Knowledge representation and issues with representing knowledge ?

Rubric	Marks
About knowledge representation. 3 marks Issues. 3 marks	6

Section 5 (Answer all question(s))

Marks CO BL

Q17. Explain agent communication. Explain point to point communication.

4 2 1

Rubric	Marks
definition 2 marks point to point communication 2 marks	4

Q18. (a) What are various types of Agent architecture? Explain any one. Also state its limitations.

6 3 2

Rubric	Marks
Various types of Agent architecture 2 marks explanation of one 3 marks limitation 1 marks	6

(OR)

(b) Differentiate fuzzy and crisp sets.

Rubric	Marks
Each difference for 1 mark	6

Section 6 (Answer all question(s))

Marks CO BL

Q19. What is NLP in AI? Write its advantages and applications.

4 3 1

Rubric	Marks
NLP 2 marks Advantages 1 mark Application 1 mark	4

Q20. (a) Explain machine learning and different types of machine learning.

6 2 1

Rubric	Marks
Explain machine learning 2 marks type of machine learning. 4 marks	6

(OR)

(b) Explain speech recognition and sentiment analysis.

Rubric	Marks
speech recognition 3 marks Sentiment Analysis 3 marks	6
