B.E. (Computer Technology) Seventh Semester (CBS)

Artificial Intelligence

P. Pages : 2 **AHK/KW/19/2326**

Time : Three Hours * 1 6 6 1 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain the various problem characteristics with suitable example. **9**

b) Explain application of Artificial intelligence. **5**

OR

2. a) What are intelligent agents? Draw and explain generic architecture of intelligence agents. **7**

b) What do you mean by control strategies? What are requirement of good control strategies? **7**

3. a) Explain simple hill climbing algorithm. What are the problems of hill climbing. **7**

b) Explain mean – end analysis with the help of example. **6**

OR

4. a) Differentiate between. **6**
i) Predicate & propositional logic. ii) Generate test & hill climbing.

b) Write and explain various steps used in conversion of wffs. Into clause form. **7**

5. a) Explain the following **any three**. **9**
i) Scripts.

ii) Frames.

iii) Fuzzy logics.

iv) Semantic Networks.

b) Explain Bayes Theorem. **4**

OR

6.	a)	Explain in brief how Bayes' theorem can be used to uncertainty handling in A-I problem.	**7**
	b)	Write short note on fuzzy logic. Explain the application of fuzzy logic.	**6**
7.	a)	What is expert system? Explain the architecture of rule – based expert system.	**7**
	b)	What is learning? Name and explain any four types of learning.	**7**

OR

8.	a)	Draw and explain block diagram of learning system.	**7**
	b)	Explain with the help of block diagram, knowledge acquisition process.	**7**
9.	a)	What are types of grammar? Explain each of them.	**6**
	b)	Explain minimax search procedure.	**7**

OR

10.	a)	List the levels of NLP and explain each with suitable example.	**6**
	b)	What are the types of grammar? Explain each of them.	**7**
11.	a)	What do you mean by ANN? Give various applications of ANN.	**7**
	b)	Write a short note on Genetic algorithm based machine learning.	**6**

OR

12.	a)	Explain the knowledge representation in artificial neural networks.	**6**
	b)	Draw and explain the basic neuron model with example.	**7**

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B.E. (Computer Technology) Seventh Semester (C.B.S.)

Artificial Intelligence

P. Pages : 2 **NJR/KS/18/4617**

Time : Three Hours * 0 2 6 5 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
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7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What are different Artificial Intelligence problem domain? Discuss different examples for each domain and analyze these examples with the help of seven characteristics of AI problem. **10**

b) Explain Application of Artificial Intelligence? **4**

OR

2. a) What are the different issues in the design of search program. **7**

b) What do you mean by control strategies? What are requirement of good control strategies. **7**

3. a) Explain mean- end analysis with the help of example. **6**

b) Explain generate and test search technique. How it differs from hill climbing. **7**

OR

4. a) Write and explain various steps used in conversion of wffs. Into clause form. **7**

b) What is Heuristic search? Discuss the importance of heuristic search over conventional search. **6**

5. a) Write a script on travelling from source to destination. **7**

b) Write a note on fuzzy logic. **6**

OR

6. a) Represent the following statement using semantic net. **6**

a) Every dog in the city bites the constable.

b) Ram was wearing a dark Coloured suit.

c) Radha gave some flowers to Sita.

b) Explain in brief how Baye's theorem can be used to uncertainty handling in AI problem. **7**

7. a) Give the general learning model, also give the role of each component in learning model. **7**

b) Draw and explain the architecture of rule-base expert system. **7**

OR

8. a) What is learning? Name and explain any four types of learning? **7**

b) Explain with the help of block diagram, knowledge acquisition process. **7**

9. a) Enlist and explain various used knowledge levels in natural language understanding. **6**

b) Explain minimax search procedure. **7**

OR

10. a) What is parsing? Explain any two types of parsing in NLU. **6**

b) What are the type of grammar? Explain each of them? **7**

11. a) Explain in detail knowledge representation in ANN. **7**

b) Write short note on Genetic Algorithm based machine learning. **6**

OR

12. a) Draw and explain the basic neuron model with example. **7**

b) Define with example: **6**

a) Artificial Neural Network.

b) Neural learning.

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B.E. (Computer Technology) Seventh Semester (C.B.S.)

Artificial Intelligence

P. Pages : 2 **NRJ/KW/17/4617**

Time : Three Hours * 0 9 4 6 * Max. Marks : 80

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7. Solve Question 11 OR Questions No. 12.
8. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Describe Turing test. If Turing test is passed, does it shows that computer exhibits intelligence? Justify your answer. **7**

b) What is production system? What are the requirements of good control strategy? **6**

OR

2. a) Two jugs are given, a 4 liter one and 3 liter one. Neither has any measuring marks on it. There is a pump that can be used to fill jugs with water. Get exactly 2 liter of water into 4 liter jug. Initially both jugs are empty. **7**
i) What are the initial and goal states of problem?
ii) Give the solution to solve this problem.
iii) List the set of rules which governs the problem.
iv) Draw a state space representation.

b) Draw and explain different components of Intelligent agent. **6**

3. a) Discuss the steepest Ascent Hill Climbing search technique. Explain problems associated with Hill climbing and also explain how to overcome those hurdles. **8**

b) Write the difference between :- **6**
i) Procedural and Declarative Knowledge.
ii) Blind search and Heuristic search Technique.

OR

4. a) Represent the following sentences into predicate logic and convert them into clause form. **6**
i) Vijay likes all kind of food.
ii) All engineering courses are difficult.
iii) You will gain weight unless you exercise.

b) Explain Unification algorithm for predicate logic. **4**

c) Explain briefly the term 'Combinatorial Explosion'. **4**

5. a) Construct semantic network for the following sentences. **6**
i) Mary gave red book to her favorite cousin.
ii) A batsman hits every ball in an over.
iii) Every dog in the town has bitten the constable.

b) Write short note on. **7**

i) Certainty factor. ii) Fuzzy logic.

iii) Conceptual Dependency.

OR

6. a) What is a frame? Give a frame structure and construct a frame for a "car". **7**

b) What is the importance of using Bayes Theorem? Explain, the joint probability and conditional probability with suitable example. **6**

7. a) Give a general learning model and describe role of each components of a general learning model and why it is needed for learning process. **7**

b) Explain the following types of Learning with example:- **6**

i) Learning by analogy. ii) Learning by taking advice.

iii) Induction learning.

OR

8. a) What do you mean by expert system shell? draw neatly the architecture of expert system. **7**

b) Demonstrate the use of knowledge engineer in Expert system with suitable diagram. Why knowledge base is kept separated from the control module in knowledge base system. **6**

9. a) Explain Syntatic and semantic processing in Natural Language processing with proper example. **6**

b) List different levels of Natural language understanding and explain each of them with suitable example. **4**

c) What are the different types of ambiguity in natural Languages? Explain each of them. **4**

OR

10. a) Discuss Min-Max search procedure. Also explain the concept of Alpha and Beta cutoffs. **10**

b) Write the importance of Game playing concept in Artificial Intelligence. **4**

11. a) Trace and explain different components of biological neuron structure. Also discuss about the basic unit of artificial neuron model. **7**

b) State simple genetic algorithm Illustrate various stochastic operators used in genetic algorithm. **6**

OR

12. a) Draw and explain the complete lifecycle of Genetic Algorithm. **5**

b) Explain different Neural learning technique with suitable example. **4**

c) State various applications of neural network and explain any two of them. **4**

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B.E. (Computer Technology) Seventh Semester (C.B.S.)

Artificial Intelligence

P. Pages : 2 **NRT/KS/19/3562**

Time : Three Hours * 0 2 6 8 * Max. Marks : 80

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7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.

1. a) Write and explain various AI problem characteristics. **9**

b) What do you mean by control strategies ? What are requirements of good control strategies. **5**

OR

2. a) What are intelligent agents ? Draw and explain generic architecture of intelligence agents. **7**

b) What are the different issues in the design of search programs. **7**

3. a) Write the algorithm for Best-first search. **7**

b) Why we need heuristic function ? Explain the heuristic function to solve Tic-Tac-Toe problem or 8-puzzle problem. **6**

OR

4. a) Differentiate between : **6**
i) Procedural and declarative knowledge.
ii) Forward and Backward reasoning.

b) Explain generate and test search technique. How it differs from hill climbing. **7**

5. a) Explain the following : **9**
i) Scripts
ii) Frames
iii) Conceptual dependency

b) For the following statement, construct a conceptual graph : **5**
"If a dog is on a mat, then it is a happy pet".

OR

6.	a)	Explain in brief how Baye's theorem can be used for uncertainty handling in AI problem.	**7**
	b)	Write short note on fuzzy logic. Explain the application of fuzzy logic.	**7**
7.	a)	Draw and explain the architecture of rule-base expert system.	**7**
	b)	Draw and explain general learning model.	**6**

OR

8.	a)	Draw and explain block diagram of learning system.	**7**
	b)	Explain with the help of block diagram, knowledge acquisition process.	**6**
9.	a)	What are the types of grammar ? Explain each of them.	**6**
	b)	Explain minimax search procedure.	**7**

OR

10.	a)	What do you mean by NLP ? Explain the following components of NLP. i) NLU (Natural Language Understanding) ii) NLG (Natural Language Generation)	**7**
	b)	List the levels of NLP and explain each with suitable example.	**6**
11.	a)	Explain the life cycle of Genetic Algorithm.	**7**
	b)	Draw and explain the basic neuron model with example.	**6**

OR

12.	a)	Explain the knowledge representation in artificial neural networks.	**6**
	b)	List the genetic operators and explain each of them with suitable example.	**7**

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B.E. (Computer Technology) Seventh Semester (C.B.S.)

Artificial Intelligence

P. Pages : 2 **NIR/KW/18/3562**

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7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain the various problem characteristics with suitable examples. **9**

b) What do you mean by intelligent agent? Explain the architecture of intelligent agent. **5**

OR

2. a) Explain various task domains of AI **5**

b) What do you mean by control strategies? **3**

c) Give the classification of production system. Explain giving example of each. **6**

3. a) Explain simple hill climbing algorithm. What are the problems of hill climbing. **7**

b) Explain resolution in propositional logic with example. **6**

OR

4. a) Differentiate between. **6**
i) Predicate & propositional logic.
ii) Generate and test & hill climbing.

b) Explain means-ends analysis with example. **7**

5. a) Explain the following **any three.** **9**
i) Scripts ii) Frames.
iii) Fuzzy logic iv) Semantic Networks.

b) Explain Bayes' Theorem. **4**

OR

6. a) Represent following statements with semantic net. **4**
i) Every mail carrier was bitten by a dog.
ii) Radha gave a Book to Meera.

b) Write a short note on conceptual graph. **4**

c) Write a script for restaurant. **5**

7. a) What is expert system? Explain the architecture of rule-based export systems. **7**

b) What do you mean by learning? Explain various types of learning with suitable example. **6**

OR

8. a) Explain with the help of diagram, knowledge acquisition process. **6**

b) Explain the following **any two**. **7**
i) OPSS system.
ii) KEE
iii) Expert system shell.

9. a) Give & explain various knowledge levels used in natural language understanding. **6**

b) What is parsing? Explain any two types of parsing in NLU. **5**

c) Explain the importance of game playing in AI. **3**

OR

10. a) Explain Minimax search procedure with illustration of – **9**
i) One/two ply search
ii) Alpha / beta cut-off

b) Write & explain in short the types of grammars. **5**

11. a) What do you mean by ANN? Give various applications of ANN. **6**

b) Write short note on: **7**
i) Genetic algorithm based m/c learning.
ii) Genetic operators.

OR

12. a) Explain different neural learning techniques. **4**

b) Draw & explain basic neuron model with example. **5**

c) Explain the following terms **any two.** **4**
i) Genes
ii) Chromosomes
iii) Cost function

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B.E. Seventh Semester (Computer Technology) (C.B.S.)

Artificial Intelligence

P. Pages : 2 **NKT/KS/17/7478**

Time : Three Hours * 0 1 2 5 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Diagrams should be given whenever necessary.
11. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain the term AI. And write the importance of AI, and task domains of AI system. **6**

b) Why we need production system? Write the different types of production systems and write one example of each type. **7**

OR

2. a) Analyze the following problem with respect to all problem characteristics. **8**
i) Travelling salesman problem
ii) Block world problem

b) What are issues taken into consideration in the design of search programs. Suggest any optimized solution for it. **5**

3. a) Why we need heuristic function? Explain the heuristic function to solve Tic-Tac-Toe problem or 8-puzzle problem. **7**

b) Write the algorithm for Best-first search. **7**

OR

4. a) Write the difference between:- **9**
i) Procedural and declarative knowledge
ii) Predicate logic and propositional logic
iii) Forward and Backward reasoning.

b) Write the steps used for unification algorithm. **5**

5. a) For the following statement, construct a conceptual graph:- **5**
"If a dog is on a mat, then it is a happy pet".

b) Write the conceptual dependency for the statement given below:- **5**
"Mary at noodles with a fork".

c) Represent the following logic statements using semantic network nodes and links **4**
i) $(\forall x)$ [Pigeon $(x) \rightarrow$ Bird (x)]

OR

6. a) What is the importance of using Bayes theorem? Explain , the conditional probability, posterior probability and prior probability. **5**

b) Explain the following :- **9**
i) Fuzzy logic and its applications.
ii) Certainty factor.
iii) Monotonic reasoning with example.

7. a) Define the term learning. Draw and explain the general learning model. **7**

b) Explain the following types of learning with example:- **6**
i) Induction learning
ii) Learning by discovery
iii) Learning by analogy

OR

8. a) Explain the following knowledge system building tools **any two.** **9**
i) Radian Rule master
ii) KEE (Knowledge engineering Environment)
ii) OPS5 system.

b) What do you mean by expert system shell? Draw neatly the architecture of expert system. **4**

9. a) What do you mean by NLP? Explain the following components of NLP. **7**
i) NLU (Natural Language Understanding) ii) NLG (Natural Language Generation)

b) List the levels of NLP and explain each with suitable example. **6**

OR

10. a) Write the two basic parsing techniques and differentiate them. **3**

b) Write the importance of Game playing concept in AI. **4**

c) Explain the following **any one.** **6**
i) Mini Max search procedure ii) Alpha - beta pruning.

11. a) Explain the knowledge representation in artificial neural networks. **6**

b) Explain the life cycle of genetic algorithm. **5**

c) Write one application of neural network, and explain it. **2**

OR

12. a) List the genetic operators and explain each of them with suitable example. **7**

b) Explain the following terms:- **6**
i) Genes ii) Chromosomes iii) Cost function.

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