

2012

G H PATEL P.G DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

MCA - V SUBJECT: PS05CMCA01 (Artificial Intelligence)

Internal Examination, 2012

Date: 03-10-2012

Time: 1:00 pm to 2:30 pm

Marks: 30

| | | |
|--|------------------|-------------|
| Q-1 | Part - I | [10] |
| | Part - II | |
| Q-2 A Define the terms: | | [4] |
| (i) Expert task | | |
| (ii) Knowledge | | |
| (iii) Inference Engine | | |
| (iv) Knowledge structure. | | |
| B Write the simple Hill Climbing algorithm. | | [2] |
| C Explain procedural knowledge representation in detail. | | [4] |
| | | |
| Q-3 A Define knowledge Grid. Also list two advantages of it. | | [2] |
| B Draw a pictorial representation of a collaborative agent of your choice. | | [2] |
| C Explain km procedure by giving pictorial model. | | [3] |
| D Explain Hopfield model and its learning algorithm. | | [3] |

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2013 MCA - 5th

B H PATEL P G DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY
MCA - V SUBJECT: PS05CMCA01 (Artificial Intelligence)
Internal Examination, 2013

Date: 11-09-2013

Time: 11:00 to 12:30

Total Marks: 30

Q-1

Section-I

[7.5]

Section - II

Q-2 A Define the terms:

[2.5]

- (i) AI
- (ii) K-commerce
- (iii) Inference engine
- (iv) Production system
- (v) Knowledge acquisition

B Differentiate between generate & test and Hill Climbing algorithm.

[3]

C Give the production rules for following problem:

[3]

You are given two jugs, a 4 – gallon one and a 3 – gallon one. Neither has any measuring marker on it. There is a pump that can be used to fill the jugs with water. How can you exactly get 2 gallons of water into 4 – gallon jug?

D Explain frame as knowledge representation structure.

[4]

Q-3 A Define knowledge grid. Also list two advantages of it.

[2]

B Draw a pictorial representation of a collaborative agent of your choice.

[2]

C Draw a pictorial representation of typical KM process.

[2]

D Minimize a simple function $f(x)=x+x=2x$ on the integer interval [0,30] using genetic algorithm. Take the 01101, 11000, 01000, 10011 strings as individuals in the first population.

[4]

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G H PATEL P G DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY
MCA - V SUBJECT: PS05CMCA01 (Artificial Intelligence)
Internal Examination, 2014

Date: 23rd September, 2014

Time: 2:00 to 3:30

Total Marks: 30

{13}

- | | |
|---|--|
| <p>Q-1</p> <p>A Define the terms: [2.5]</p> <ul style="list-style-type: none">(i) Artificial Intelligence(ii) Modus Ponens(iii) Inference Cycle(iv) Knowledge Engineer(v) Knowledge Base <p>B List down categories of knowledge base system and explain any one in detail. [3]</p> <p>C Explain in detail difficulties in development of knowledge based system. [3]</p> <p>D Explain script as knowledge representation structure with an example to visit dentist. [3]</p> | |
| <p>Q-3 A Draw a pictorial representation of general structure of typical mobile agent. Explain its working in a few lines. [3]</p> <p>B Draw knowledge management cycle. Explain each phase in one to two lines. [4]</p> <p>C Maximize function $f(x) = x+2$, where x falls under $[0,7]$ using GA. [4] What is the value of x that optimizes the function? What is the maximum function value?</p> | |
- Note: Take encoding strategy as binary and show at least two population generations with one mutation and one crossover operations.*

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G H PATEL P G DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY
MCA - V SUBJECT: PS05CMCA01 (Artificial Intelligence)
Internal Examinations, 2015

Date: 15-09-2015

Time: 11:00 to 12:30

Total Marks: 30

| | | |
|------------------|---|-------|
| Q1 | <i>Objective questions in separate sheet.....</i> | [7.5] |
| Q2 A | Define the terms: (i) AI (ii) Inference engine (iii) Production system (iv) Hybrid agent (v) Give full forms of (i) KQML and (II) ACL. | [2.5] |
| Q2 B | List the test's to determine whether the machine is intelligent or not and explain any one of them in detail. | [3] |
| Q2 C | Give the production rules for following problem: You are given two jugs, a 4 – gallon one and a 3 – gallon one. Neither has any measuring marker on it. There is a pump that can be used to fill the jugs with water. How can you exactly get 2 gallons of water into 4 – gallon jug? | [3] |
| Q2 D | List categories of KBS and explain any one of them in detail. | [4] |
| Q3 A (i) | Define collaborative agent. Also give an example of a collaborative agent. | [2] |
| Q3 A (ii) | Describe architecture of a collaborative agent of your choice by giving its diagram. | [2] |
| Q3 B | Define mutation and crossover functions on individuals (by taking suitable examples) with (a) Binary encoding of 5 binary digits OR (b) Tree structure encoding | [2] |
| Q3 C | Explain process of knowledge management by giving knowledge management cycle in pictorial form. | [4] |

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2016

DIPATEL P.G DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY
MCA - V SUBJECT: PS05CMCA01 (Artificial Intelligence)
Internal Examinations, 2016

Date: 07.09.2016

Time: 11:00 to 12:30

Total Marks: 30

{ 11 }

[7.5]

[2.5]

Q1 Objective questions in separate sheet.....

Q2 A Define the terms:

- ✓(i) Knowledge engineer 14
- ✓(ii) Modus tollens 36
- ✓(iii) Knowledge based shell 45
- ✓(iv) Supervised learning
- (v) Fitness function

Q2 B Differentiate between (i) Generate and test V/S Hill climbing (ii) KBS 19 [3]
V/S CBIS

Q2 C Draw the general structure of KBS and explain its component in brief. 55 [3]

Q2 D Write a note on types of knowledge. 6 3 [4]

OR

Discuss in detail existing techniques for knowledge acquisition. 6 2

Q3 (i) Draw outline of genetic algorithm with proper labels in it. 218 to 219 [2]
Draw natural neuron and artificial neuron. Also explain working of artificial neuron. 192 to 193 192 [2]

(iii) Given following two valid routes of travelling sales person problem, 3 [3]
create adjacency table and two new routes via the table. 228
Route 1: (34125); Route 2: (25134)

OR

Minimize $f(x) = 2x+5$; where x belongs to $[0,7]$. Take initial population as (101, 110, and 100). Show at least one cross over and one mutation operation.

(iv) Draw architecture of a multi layer perceptron with proper labels. Explain each component in one to two lines. 3 [3]

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P.T.O.

G.H.PATEL P.G DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY
MCA - V SUBJECT: PS05CMCA01 (Artificial Intelligence)
Internal Examinations, 2016

Date: 07-09-2016

Time: 11:00 to 12:30

Total Marks: 30

Q1

Objective questions in separate sheet.

Q2 A

Define the terms:

[7.5]

- (i) Knowledge engineer
- (ii) Modus tollens
- (iii) Knowledge based shell
- (iv) Supervised learning
- (v) Fitness function

[2.5]

Q2 B

Differentiate between (i) Generate and test V/S Hill climbing (ii) KBS V/S CBIS. [3]

Q2 C

Draw the general structure of KBS and explain its component in brief. [3]

Q2 D

Write a note on types of knowledge. [4]

OR

Discuss in detail existing techniques for knowledge acquisition.

Q3 (i)

Draw outline of genetic algorithm with proper labels in it. [2]

(ii)

Draw natural neuron and artificial neuron. Also explain working of artificial neuron. [2]

(iii)

Given following two valid routes of travelling sales person problem, create adjacency table and two new routes via the table. [3]

Route 1: (34125); Route 2: (25134)

OR

Minimize $f(x) = 2x+5$; where x belongs to $[0,7]$. Take initial population as {101, 110, and 100}. Show at least one cross over and one mutation operation.

(iv)

Draw architecture of a multi layer perceptron with proper labels. Explain each component in one to two lines. [3]

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INTERNAL EXAMINATIONS

Date: Friday, 22nd September 2017

Mark: 30

Time: 11:00 to 12:30

Note: Questions of both the sections are to be written in separate sheets.

Section I

Q1 Select the most appropriate answer.

1 Game playing is example of _____.

- a. Formal task.
- b. Mundane task.
- c. Expert task.
- d. Scientific task.

2 Chinese room experiment is to check _____ of machine.

- a. Operability.
- b. Intelligence.
- c. Performance.
- d. Strength.

3 The example of CBIS is _____.

- a. KBS
- b. Intelligent system.
- c. Decision support system.
- d. none of these

Q2 Short Questions

1 Differentiate between BFS and DFS.

2 Write algorithm for hill climbing method.

3 Explain Turing test in brief.

Q3 Long Questions

1 Draw general structure of KBS and explain its component in detail.

2 List categories of KBS and explain any one in detail.

Section II

Q4 Select the most appropriate answer.

1 The principle of genetic algorithm is based on _____.

- a. Survival of the fittest
- b. Blind search.
- c. Stored program concept
- d. None of these

2 _____ is an entity that works on behalf of its user.

- a. Function
- b. Class library
- c. Object
- d. None of these

3 Knowledge of a neural network is stored in its _____.

- a. Weights
- b. Nucleus
- c. Structure
- d. Connections and weights

Q5 Short Questions

1 Define mobile agent. Also explain its working in brief.

2 Define perceptron by giving its diagram. Also state when it is useful.

3 What are the typical stopping criteria of genetic algorithms?

Q6 Long Questions

1 Explain collaborative agent by giving an example with diagram. Also state role of each component in it.

2 Explain how multi layer perceptron (MLP) works. Also provide structure of it.

Best of Luck

M (06/03)

SARDAR PATEL UNIVERSITY
M.C.A Master of Computer Applications
Semester -V External Examinations, October 2018
PS05CMCA01 – Artificial Intelligence

Time: 2:00 p.m to 05:00 p.m.

Tuesday, 23rd October, 2018

Max Marks: 70

Q1. Choose the most appropriate option for each question.

[8]

- I. _____ test determines whether the given program is intelligent or not.

| | |
|-----------------|-----------|
| A) Covering | B) Turing |
| C) Partitioning | D) Fuzzy |
- II. _____ approach is also called as goal directed/driven approach.

| | |
|---------------------|----------------------|
| A) Forward chaining | B) Backward chaining |
| C) BFS | D) All of these |
- III. The rule $\sim P \Rightarrow \sim Q$ and Q is true, then P is true is _____.

| | |
|-----------------|------------------|
| A) Modus Ponens | B) Modus Tollens |
| C) Chain Rule | D) None of these |
- IV. Quantifiers are not present in _____ logic.

| | |
|-----------------|------------------|
| A) Predicate | B) Proposition |
| C) Both A and B | D) None of these |
- V. _____ is an artificial neural network model that uses parallel relaxation.

| | |
|---------------------|------------------|
| A) Perceptron model | B) Kohonen model |
| C) Hopfield model | D) All of these |
- VI. The principle of genetic algorithm is based on _____.

| | |
|----------------------|-----------------|
| A) Natural evolution | B) Fine logic |
| C) Statistics | D) Binary logic |
- VII. _____ is the characteristic of an agent.

| | |
|-------------------|-----------------|
| A) Pro-activeness | B) Co-operation |
| C) Autonomy | D) All of these |
- VIII. _____ method of learning in ANN requires datasets.

| | |
|---------------|------------------|
| A) supervised | B) Unsupervised |
| C) Parallel | D) None of these |

[14]

Q2. Answer the following questions (Any Seven):

- a. Differentiate between CBIS and KBS.
- b. Write only algorithm for generate – and – test method.
- c. Define fuzzy set and give one example of fuzzy set.
- d. List any four components of predicate logic.
- e. Give any two activation functions of ANN.
- f. Define knowledge management process. Also list its advantages.
- g. Explain (i) mutation and (ii) crossover in binary encoding in GA.
- h. Define soft computing. Also list constituents of soft computing.
- i. List any two applications of AI that make the Web intelligent.

(P.T.O.)

(1)

Q3. Answer the following questions:

- a. Define AI. List the domain areas of AI. Discuss advantages and disadvantages of AI. [6]
- b. Explain hill climbing search method by giving its algorithm and its variation in detail. [6]
- b. Draw the general structure of KBS. Also list and explain any one category of KBS in detail. [6]

Q4. Answer the following questions:

- a. Write a detailed note on fuzzy rule based system. [6]
- b. For Fuzzy sets $A = \{(x_1, 0.3), (x_2, 0), (x_3, 0.7)\}$ and $B = \{(x_1, 0.6), (x_2, 1), (x_3, 0.7)\}$ Find [6]
- (1) $\bar{A} \oplus \bar{B}^c$
 - (2) $(\bar{A} \oplus \bar{B}) \cap \bar{B}$

OR

- b. Define fuzzy prepositions and discuss fuzzy connectives with their use in detail by taking suitable examples. [6]

Q5. Answer the following questions:

- a. Draw biological neuron and an artificial neuron. Also explain how an artificial neuron is working. [6]
- b. Explain in detail how a perceptron solves a linearly separable problem. [6]

OR

- b. Design a neural network to select a course based on following data. [6]

| | X1 | X2 | X3 | X4 | X5 | O1 | O2 | O3 |
|---------|---------------|-------------------|-------------------|---------------------|-------------------------|------------|------------|------------|
| Sr. No. | Job Prospects | Personal Interest | Successes History | Available Resources | Availability of Teacher | Elective 1 | Elective 2 | Elective 3 |
| 1 | Very high | Good | Acceptable | Acceptable | Good | 1 | 0 | 0 |
| 2 | Very high | Less | Good | Good | Acceptable | 0 | 1 | 0 |
| " | ... | ... | ... | ... | ... | " | " | " |

Q6. Answer the following questions:

- a. Define mobile agent. Explain working of a typical mobile agent by giving its diagram. [6]

- b. Minimize $f(x) = x + 2$; where x belongs to $[1, 31]$ with help of genetic algorithms. [6]

Take the initial population as $\{11011, 01101, 10011\}$.

What is the value of x that optimizes the function?

What is the minimum function value?

OR

- b. Draw outline of typical genetic algorithm cycle. Also explain its working in detail. [6]

