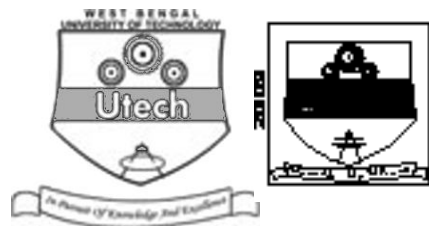


CS/B.TECH (CSE) (SUPPLE)/SEM-7/CS-702/09
ARTIFICIAL INTELLIGENCE (SEMESTER - 7)



1.
Signature of Invigilator

2.
Signature of the Officer-in-Charge

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Roll No. of the
Candidate

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

CS/B.TECH (CSE) (SUPPLE)/SEM-7/CS-702/09
ENGINEERING & MANAGEMENT EXAMINATIONS, JULY – 2009
ARTIFICIAL INTELLIGENCE (SEMESTER - 7)

Time : 3 Hours]

[Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
b) For **Groups – B & C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

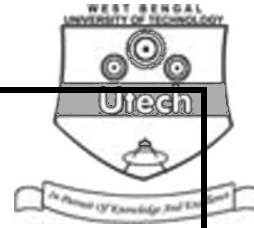
FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B					Group – C					Total Marks	Examiner's Signature
Question Number																						
Marks Obtained																						

.....
Head-Examiner/Co-Ordinator/Scrutineer

S-53010 (27/07)



**DO NOT WRITE
ON THIS PAGE**



CS/B.TECH (CSE) (SUPPLE)/SEM-7/CS-702/09
ARTIFICIAL INTELLIGENCE
SEMESTER - 7



Time : 3 Hours]

[Full Marks : 70

GROUP – A**(Multiple Choice Type Questions)**

1. Choose the correct alternatives for the following :

10 × 1 = 10

i) Computers are better than human beings in the matter of non-numeric symbolic processing.

a) Always

b) Sometimes

c) Never

d) Most of the times.

ii) A I does not overlap with

a) linguistics

b) psychology and philosophy

c) both (a) and (b)

d) none of these.

iii) Which of the following is appropriate ?

a) $\forall P P(x) \rightarrow Q(x)$ is a valid wffb) $\text{Man}(\text{John})$ is a valid wff

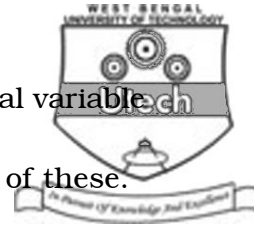
c) Both (a) and (b) are valid wff

d) None of (a) and (b) are valid wff.



iv) The variable “quality of restaurant” is a

- a) nominal variable b) ordinal variable
c) binary variable d) none of these.



v) Knowledge consists of

- a) concepts and procedures b) facts and rules
c) all of these d) none of these.

vi) Find out the most appropriate representation for “Alive means not dead”.

- a) $\forall x : \exists y : [\text{alive}(x, y) \rightarrow \neg \text{dead}(x, y)]$
b) $\forall x : \forall y : [\text{alive}(x, y) \rightarrow \neg \text{dead}(x, y)]$
c) $\forall x : \forall y : [\text{alive}(x, y) \rightarrow \neg \text{dead}(x, y)] \wedge [\neg \text{dead}(x, y) \rightarrow \text{alive}(x, y)]$
d) $\exists x : \forall y : [\text{alive}(x, y) \rightarrow \neg \text{dead}(x, y)] \wedge [\neg \text{dead}(x, y) \rightarrow \text{alive}(x, y)]$

vii) What will be the output of the following Prolog program segment ?

$f(0, 1)$

$f(F, G) : Y \text{ is } F - 1, f(Y, U), G \text{ is } F + U.$

for

$?f(3, X).$

- a) $X = 0 \ 1 \ 1$ b) $X = 1 \ 1 \ 2$
c) $X = 2$ d) none of these.



viii) Searching techniques are used for

- a) goal nodes earching
- b) optimization of search space
- c) finding goal distance of the goal node from start node
- d) all of these.

d

ix) Prolog is mainly used for

- a) numerical data manipulation
- b) representing different functions and their relations
- c) database handling
- d) both (a) and (b).

x) Network representations provide means of

- a) structuring and exhibiting the structure in knowledge
- b) exhibiting the structure in knowledge
- c) structuring the structure in knowledge
- d) none of these.

a

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. Define search space, goal distance, heuristics, goal and explored node.
3. List two distinguishing features between procedural knowledge and declarative knowledge. Also give an example of each type of knowledge.

4 + 1

S-53010 (27/07)



4. Represent the following facts using FOPL :

- i) Rammohan is a Bengali
- ii) All Bengalis are Indians
- iii) All Bengalis either speak to Rammohan or smile at him.

5. Write schemata for default reasoning using the following statements :

- i) If someone is an adult and it is consistent to assume that adults can vote, infer that the person can vote.
- ii) If one is at least 18 years old and it is consistent to assume that one who is physically fit and who passes a test may obtain a driving licence, infer that such a person can obtain a driving licence.

6. Convert the following wff into set of clause :

$$\forall x (\exists y \text{ postman}(y) \wedge \text{bite}(x, y) \rightarrow \text{dog}(x)).$$

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following.

3 × 15 = 45

7. a) Write a PROLOG program to find out the n^{th} Fibonacci number.

Assume the series starts with 1, 1, 2, 3, 5,

b) Assume the following facts ;

- i) Amit only likes easy courses.
- ii) Science courses are hard.
- iii) All the courses in the basket weaving department are easy.
- iv) BK-304 is a basket weaving course.

Use resolution to answer the question :

“What courses would Amit like ?”

5 + 10



8. a) What is the “means-end-analysis” technique ? Explain this with the help of an example. 12 + 3
- b) Write the A^* algorithm. What is graceful decay of admissibility ?
9. a) Convert the following statement into a well-formed formula (wff) :
 “Any person who is respected by every person is a truly respected person.”
- b) Write down the difference between the following :
- Associative network and conceptual graph
 - Frame and script
 - Forward and backward reasoning.
- c) Can a system engaged in purely numeric computation be called a non-intelligent system ? Explain with suitable arguments. 3 + 9 + 3
10. a) Translate the following into clausal form :
- $$(\forall x)(\forall y)((\exists z)(P(x, z) \& P(y, z)) \rightarrow (\exists u)Q(x, y, z))$$
- b) Transform the following conceptual graph into equivalent FOPL statement.
- (Past) \rightarrow [[Comel : Sonu] \leftarrow (AGENT) \leftarrow [DRINK]
- \rightarrow (OBJECT) \rightarrow [WATER]
- \rightarrow (ATTRIBUTE) \rightarrow [LOVELETTERS]]
- c) Transform the following into conjunctive normal form :
- $$P \rightarrow (N (Q \rightarrow R))$$
- 5 + 5 + 5
11. Write short notes on any *three* of the following : 3 × 5
- Inductive learning
 - Knowledge acquisition
 - Alpha-beta pruning
 - Hill climbing search
 - Analogical inference.

END