

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] APRIL - MAY 2019

Paper Code: ETCS-310

Subject: Artificial Intelligence

(Batch 2013 Onwards)

Time: 3 Hours

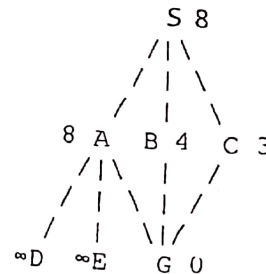
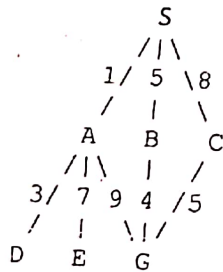
Maximum Marks: 75

Note: Attempt five questions in all including Q no.1 which is compulsory.
Select one question from each unit.

- Q1 Attempt **any five** parts from the following:- (5x5=25)
- Explain Turing Test.
 - Write state space description for 8 puzzle program. ✓ ML
 - Compare the performance of DFS and BFS considering the four evaluation criteria.
 - Given branching factor $b=9$ and $d=6$, find out the number of nodes generated in BFS and IDS.
 - You are given two jugs with measuring marks, a 4-gallon one and a 3-gallon one. There is a pump to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug? For the agent of water jug, develop a state space description.
 - Explain problem solving in AI.

UNIT-I

- Q2 (a) Consider following search space where the start state is S and the goal state is G and apply the A* Algorithm. First graph is contains edge cost and second contain the heuristic cost. (8.5)



- (b) List the order of nodes generated and expanded in the tree given in figure of part (a) using (4)
- DFS
 - BFS
 - IDS
 - Uniform cost search
- Also show whether the solution found is optimal?

- Q3 (a) Prove the optimality of A*. (5)
- (b) Explain constraint satisfaction problem. Solve the following crypt arithmetic puzzle. (7.5)

SEND
MORE

MONEY

P.T.O.

ETCS-310



UNIT-II

Q4 (a) Explain forward chaining and backward chaining with suitable example. *M2* (5)

(b) Explain algorithm for unification. Given following sentences - Find the set of substitution using unification algorithm. (7.5)

$C1 = \{\sim P(z1, a), \sim P(x, z1)\}$

$C2 = \{P(z2, f(z2)), P(z2, a)\}$

$C3 = \{P(f(z3), z3), P(z3, a)\}$

Q5 (a) Convert following in FOL- (5)

(i) Anyone who buys carrots owns either a rabbit or a grocery store.

(ii) Every dog chases some rabbit.

(iii) Mary buys carrots.

(iv) Anyone who owns a rabbit hates anything that chases any rabbit.

(v) John owns a dog.

(vi) Someone who hates something owned by another person will not date that person.

Convert above in clause form and prove by resolution following Conclusion- "If Mary does not own a grocery store, she will not date John".

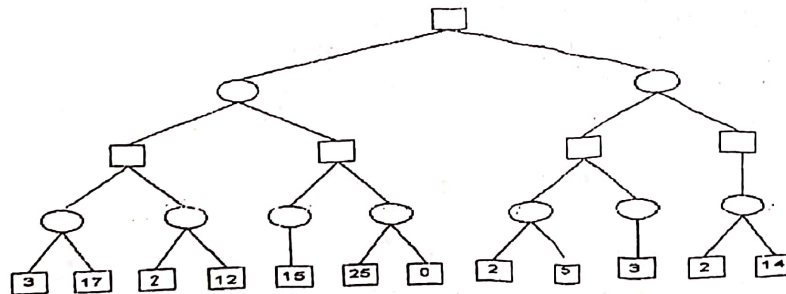
(b) Prove following:-

$$(p \rightarrow r) \vee (q \rightarrow r) \equiv (p \wedge q) \rightarrow r$$

(7.5)

UNIT-III

Q6 (a) Give a detailed description of the technique of alpha beta pruning. Illustrating your answer using the game tree above (figure - first level is max level). (7.5)



(b) What is an expert system? Explain MYCIN. (5)

Q7 (a) Explain various methods of proving a theorem. (7.5)

(b) Write a note on natural language processing in AI applications. (5)

UNIT-IV

Q8 (a) Explain inductive learning. How it is different from deductive learning. (7.5)

(b) Explain learning decision tree. (5)

Q9 (a) Give applications of AI in different fields. (7.5)

(b) What is explanation based learning. (5)

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(Please write your Exam Roll No.)

Exam Roll No.:.....

7/3/20

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MID TERM EXAMINATION

SIXTH SEMESTER [B.TECH.] FEB-2020

Paper Code: ETCS-310

Subject: Artificial Intelligence

Time: 1:30 Hours

Maximum Marks: 30

Note: Attempt any Three questions including Q. No. 1, which is compulsory

Q No. 1

- a) How will you define Artificial Intelligence in terms of its task domain?
- b) Define how production system is useful for solving AI problems?
- c) What approaches required for the knowledge representation in a particular domain? M2
- d) When would best-first-search be worse than simple breath-first-search?

[2.5X4]

Q No. 2

- a) M1 What is AI? How do you compare human intelligence with artificial intelligence?
- b) How do you define the characteristics of a problem, for the solution that is desired and the circumstances under which the solution must take place?

[5]

[5]

Q No. 3

- a) M2 What are the basis of resolution? What do mean by resolution in propositional logic?

[5]

- b) Trace the constraint satisfaction procedure solving the following Cryptarithmic problem:

CROSS
+ ROADS

DANGER

[5]

Q No. 4

- a) Explain "means-end-analysis", with the help of an example. [5]
- b) Represent following sentences as a set of wff's in predicate logic:

1. All Romans were either loyal to Ceasar or hated him.
2. People only try to assassinate rulers they are not loyal to. [5]

END



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Exam Roll No.

13/06/18

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY-JUNE 2018

Subject: Artificial Intelligence

Paper Code: ETCS-310 [Batch 2013- Onwards]

Time : 3 Hours

Maximum Marks : 75

Note: Attempt all questions as directed. Internal choice is indicated.

Q1. Answer the following questions:-

(a) What is AI? What is the application of AI in domain of Natural Language Processing? (10x2.5=25)

(b) Name the two kinds of synchronous rules that allow deductions.

(c) What is a static evaluation function in game tree?

(d) What are the different techniques to represent inherited knowledge? (6.25)

(e) What is Heuristic Search?

(f) Define Expert System Shell.

(g) Discuss the advantages of Decision support systems.

(h) How does alpha beta pruning technique works? Explain. (6.25)

(i) What is local minima problem?

(j) What is genetic learning?

Q2. "AI is both a science and a field of engineering". Justify this statement with the help of an example. (6)

(b) Explain Tic-Tac-toe problem. (6.5)

OR

Q3. Explain the following search algorithms:

(a) Depth first search

(b) AO*

(6.25)

(6.25)

Q4. (a)

Illustrate the use of first-order-logic to represent the knowledge. (6.25)

(b) Describe mapping between facts and representation. (6.25)

OR

Q5. (a) Differentiate between Inheritable knowledge and Inferential Knowledge? (6.25)

(b) Discuss Inheritable knowledge by applying the steps to real world application of your choice. (6.25)

Q6. (a) Explain syntactic processing. (6.25)

(b) Differentiate between syntactic process and semantic processing. (6.25)

OR

Q7. (a) Write short note on Explanation Based Learning. (6)

(b) What procedure is used to make a move in Game tree? What is alpha beta cut-off? (6.5)

Q8. (a)

Describe the main parts of an expert system. Show how they interact with one another. (6.25)

(b) Explain the concept of decision tree. With example explain the use of decision tree in learning. (6.25)

OR

Q9. (a) Explain different task that must be performed for natural language understanding. (6.5)

(b) Write short note on:

- Statistical reasoning - Neural nets (6)

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9/4/2022

(Please Write your Roll No. immediately)

Roll No

Mid-Term Examination

B.Tech – VI Semester
Paper Code: ETCS-310
Time: 1.5 hour

April, 2022
Subject – Artificial Intelligence
Max Marks: 30

Note: Q.No. 1 is Compulsory. Attempt any two more Question from the rest.

Q1.

(2*5=10 marks)

- a.) Differentiate Propositional logic and FOPL with example. *M2*
- b.) What is PEAS? Specify PEAS for an Aerospace System.
- c.) Obtain disjunctive normal form of:
$$p \vee (\sim p \Leftrightarrow (q \vee (q \Leftrightarrow \sim r)))$$
- d.) Explain Turing Test. Why Turing Test was criticised and also explain Chinese room Argument Test.
- e.) Differentiate OR graph and AND-OR graph.

Q2. a.) What is heuristic search? Explain Hill Climbing and its limitations. *M1* (5 marks)

b.) Explain Iterative Deepening Depth First Search with example. (5 marks)

Q3. a.) Represent the following facts in FOPL: (5 marks)

- i.) All men are mortal
- ii.) Some pet dogs are dangerous
- iii.) All basketball players are tall
- iv.) Lipton is a tea
- v.) Some employees are sick today.

b.) Check the validity of following argument: (5 marks)

“If I get the job and work hard, then I will get promoted. If I get promoted, then I will be happy. I will not be happy. Therefore, either I will not get the job or I will not work hard”.

Q4. a.) Solve following cryptographic puzzle using Constraint Satisfaction procedure: (5 marks)

FOUR
+ MICE

FOUND

a.) Discuss forward and backward chaining with suitable example. *M2* (5 marks)

