

**PARUL UNIVERSITY**  
**FACULTY OF IT & COMPUTER SCIENCE**  
**MCA., Summer 2017 – 18 Examination**

**Semester: 4**  
**Subject Code: 05201283**  
**Subject Name: Artificial Intelligence**

**Date: 26/05/2018**  
**Time: 10:30am to 1:00pm**  
**Total Marks: 60**

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Answer the followings.****A. Write short notes.****(05)**

1. What is artificial intelligence?
2. Scientific Analysis is an example of which Task of AI?
3. Which search method takes more memory?
4. How do you represent “All professors are people”?
5. What are components of Planning System?

**B. Multiple choice type questions. (Each of 01 marks)****(10)**

1. An algorithm is complete if
 

a. It terminates with a solution when one exists	b. It starts with a solution
c. It does not terminate with a solution	d. It has a loop
2. Translate the following statement into FOL.  
 “For every X, if X is a PhD student, then X has a master degree”
 

a. $\forall x \text{ PhD}(X) \rightarrow \text{Master}(X)$	b. $\exists x \text{ PhD}(X) \rightarrow \text{Master}(X)$
c. A is true, B is true	d. A is false, B is false
3. Which is not the commonly used programming language for AI?
 

a. PROLOG	b. JAVA
c. LISP	d. None of the above
4. A\* algorithm is based on
 

a. Breadth-First-Search	b. Depth-First –Search
c. Best-First-Search	d. Hill climbing.
5. Which of the following is not a STRIP Style operator?
 

a. DELETE	b. PRECONDITION
c. ADD	d. POSTCONDITION
6. In which of the following Example Solution steps can be ignored?
 

a. Theorem Proving	b. 8 Puzzle
c. Playing Chess	d. None of the above
7. Which of the following is an example of Non-Monotonic and Partially commutative production system?
 

a. Theorem Proving	b. Robot Navigation
c. Chemical Synthesis	d. Bridge
8. Lifted inference rules require finding substitutions that make different logical expressions looks identical.
 

a. Existential Instantiation	b. Universal Instantiation
c. Unification	d. Modus Ponem
9. Which search is equal to minimax search but eliminates the branches that can't influence the final decision?
 

a. Depth-first search	b. Breadth-first search
c. Alpha-beta pruning	d. None of the mentioned
10. How many proposition symbols are there in artificial intelligence?
 

a. 1	b. 2
c. 3	d. 4

**Q.2 Answer the followings.****(15)**

1. Define CNF and DNF with example. (3)
2. List down the various variables and control structure in Prolog (3)
3. Discuss limitations of Hill climbing search method. (3)

4. Discuss various issues in design of search program. (2)
5. What is NLP? List down steps involve in NLP (2)
6. Explain Problem reduction. (2)

**Q.3 Answer the following. (Any three) (15)**

1. Explain Various Issues in Knowledge Representation.
2. Explain Syntactic Analysis with example.
3. Explain Steepest Ascent Hill Climbing in detail.
4. Define AI. Explain the characteristics of AI problem.

**Q.4 Answer the following.**

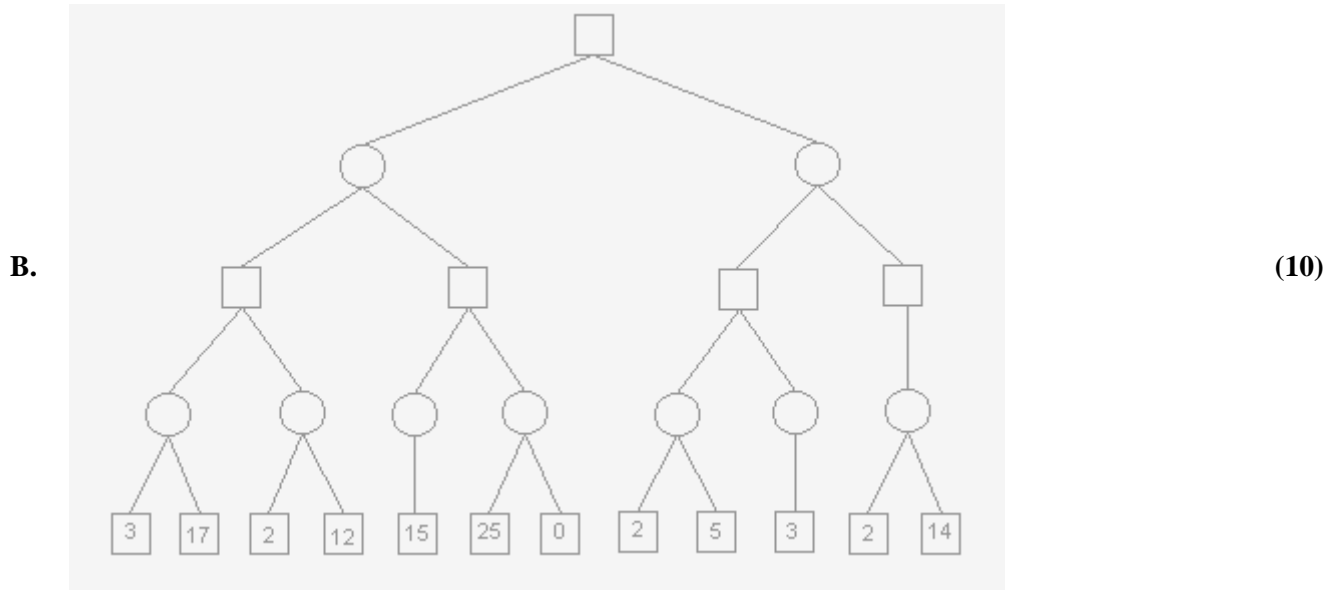
Solve the following Cryptarithmic Problem.

**A.**

$$\begin{array}{r}
 \text{S E N D} \\
 + \text{M O R E} \\
 \hline
 \text{M O N E Y}
 \end{array}$$

**(05)**

Solve below given tree using Alpha-Beta Pruning Method



**OR**

Consider the following sentences:

- Every child loves Santa.
- Everyone who loves Santa loves any reindeer.
- Rudolph is a reindeer, and Rudolph has a red nose.
- Anything which has a red nose is weird or is a clown.
- No reindeer is a clown.
- Scrooge does not love anything which is weird.

**B. (10)**

- (i) Translate the above sentences into formulas in Predicate logic
- (i) Prove using resolution that “Scrooge is not a child.”