

MCA (Revised)

05645

Term-End Examination

June, 2018

MCSE-003 : ARTIFICIAL INTELLIGENCE AND
KNOWLEDGE MANAGEMENT

Time : 3 hours

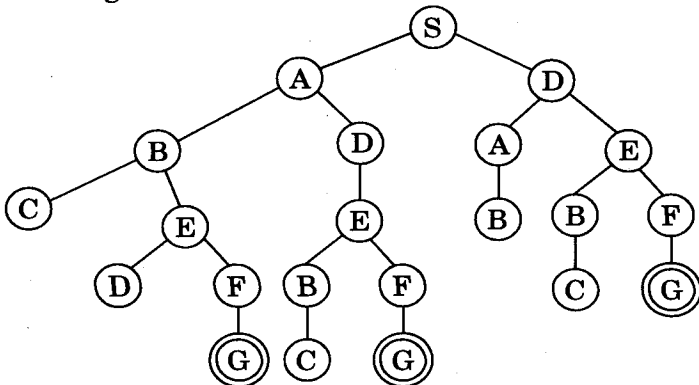
Maximum Marks : 100

*Note : Question number 1 is compulsory. Attempt any
three questions from the rest.*

1. (a) Transform any *two* of the following to DNF : 5
- (i) $P \rightarrow (\sim (Q \rightarrow R))$
 - (ii) $(P \rightarrow Q) \rightarrow \sim P$
 - (iii) $\sim (P \rightarrow Q) \rightarrow \sim R$
- (b) Evaluate the following LISP expressions : 10
- (i) (greaterp 18 151 76)
 - (ii) (reverse ((p q) r (s t)))
 - (iii) (list 'a '(b c))
 - (iv) (cadadr '(x (y z) l))
 - (v) (append 'a '(b c d))

- (c) Translate the following statements into WFF : 5
- (i) Every person has a mother
- (ii) There is a man and he is father of Joe
- (d) Discuss “Chinese Room Test”. How did the outcomes of the Chinese Room Test contribute in the development of machine intelligence ? 5
- (e) Differentiate between single agent and multiagent environment. 5
- (f) What do you understand by the term “Fuzzyfication” ? Define Fuzzyfunction “Tall-man”. 5
- (g) Discuss the components of conceptual graph. Transform the following conceptual graph into FOPL statement : 5
- [PERSON : Anita] ← (AGENT) ← [DRINK] → (OBJECT) → [FOOD : MILK] → (Instrument Glass)

2. (a) Write the DFS algorithm. Use DFS to search the goal node **Ⓞ**. Show each step of the algorithm. 10



- (b) Write short notes on any *four* of the following : 10
- (i) Prenex normal form
 - (ii) Skolemization
 - (iii) Clausal form
 - (iv) Resolution
 - (v) Unification
3. (a) What is an Expert System ? Explain the architecture of an Expert System. Create an expert system to infer, whether a student has secured poor, good, average or excellent marks in the examinations. 10
- (b) Write A* algorithm. Briefly discuss any application area of A* algorithm. 5
- (b) Briefly describe the components of "Truth Maintenance System (TMS)". 5
4. (a) Differentiate between any *two* of the following :
- (i) Monotonic reasoning and Non-Monotonic reasoning
 - (ii) Predicate logic and Propositional logic
 - (iii) Supervised learning and Unsupervised learning
- Give suitable examples, expressions and diagrams, while differentiating. 10

- (b) Write short notes on any *two* of the following : 10
- (i) Turing Test
 - (ii) Semantic Nets
 - (iii) Frames
5. (a) Discuss any *two* of the following : 6
- (i) Lambda Function
 - (ii) Mapcar Function
 - (iii) Cond Function
- (b) Write a program in Prolog to identify the following relations :
- (i) Grandfather (X, Y)
 - (ii) Sister (X, Y)
- Develop appropriate knowledge base and write the rule applicable to the knowledge base. 7
- (c) Write a program in LISP to find the factorial of a number, entered by the user. Give comments in the program to explain your logic. 7
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