FACULTY OF ENGINEERING

B.E. 4/4 (CSE) I – Semester (New) (Main) Examination, November 2013

Subject : Artificial Intelligence

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1. Define the term artificial intelligence. List down few applications of A.I.   3

2. Represent in predict calculus the knowledge contained in the following sentences.
   a) Some men are rich
   b) Every city has a policeman who has been beaten by every thief in the city   2

3. Define Skolem function. Give an example.   2

4. What is : -
   i) Frame problem   ii) Qualification problem   iii) Ramification problem   3

5. What is Sussman Anomaly?   2

6. Define smoothing in statistical natural language processing. Name two methods of
   smoothing.   3

7. Define N-grams in natural language processing. Give an example for a bigram.   2

8. Define passing in natural language processing. Which are the different ways of
   passing?   3

9. What are fuzzy hedges? Give examples and draw a graph showing fuzzy hedges.   3

10. What is unification in predicate calculus? Unify the following clause.   2
    F(saurav, x) and f(y,z).

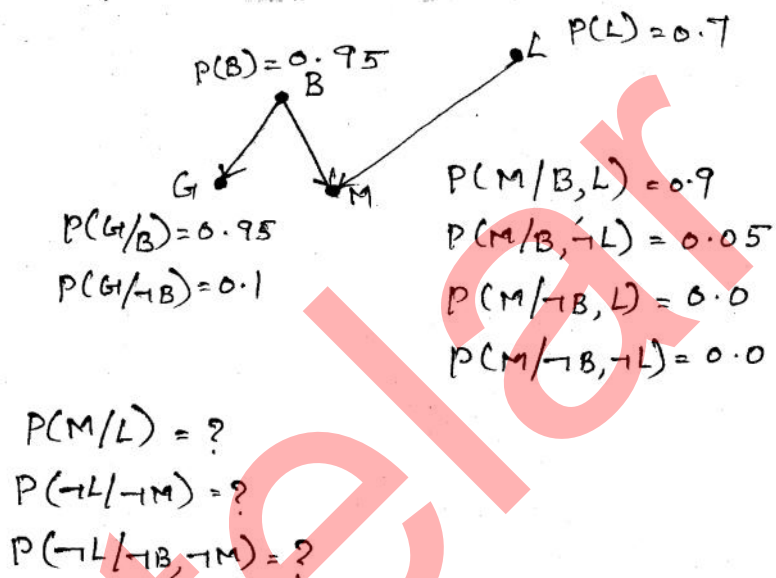## PART – B (50 Marks)

11. Write down algorithm A* and explain using the graph for eight tiles problem.   10

12. Consider the following game tree.   10
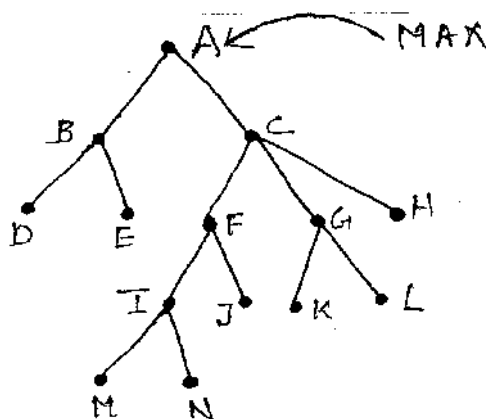
   a) Find the best move for the MAX player using the minimax procedure.
   b) Perform a left to right alpha-beta pruning on the tree. Indicate where
      the cutoffs occur.

13. Anyone passing his history exams and winning the lottery is happy. But anyone who studies on is lucky can pass all his exams. John did not study but is lucky. Anyone who is lucky wins the lottery. Is John happy? Convert these sentences into predicate calculus statements and, using resolution reputation procedure, find out the answer.   10

14. For the given Baye's Network, find out the following probabilities using the three patterns of inferences.   10

$$P(B) = 0.95$$
$$P(L) = 0.7$$
$$P(G/B) = 0.95$$
$$P(G/\neg B) = 0.1$$
$$P(M/B, L) = 0.9$$
$$P(M/B, \neg L) = 0.05$$
$$P(M/\neg B, L) = 0.0$$
$$P(M/\neg B, \neg L) = 0.0$$

$$P(M/L) = ?$$
$$P(\neg L/\neg M) = ?$$
$$P(\neg L/\neg B, \neg M) = ?$$

15. Illustrate plan-space search methods using partial order planning as applied is Sussman anomaly. Draw the final plan structure with total ordering.   10

16. Explain Back-propagation learning algorithm in multilayered feed-forward network.   10

17. Write short notes on :   10
    a) Sugeno style of inference processing
    b) Neuro fuzzy systems
    c) α-cut threshold

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