SVKM's NMIMS

MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING

Programme: B.Tech (Computer)   Year: IV   Semester: VII

Academic Year: 2019-20

Subject: Artificial Intelligence

Date: 11 November 2019

Marks: 70
Time: 2.00 pm - 5.00 pm
Durations: 3 (hrs)
No. of Pages: _3_

Final Examination (2019-20)

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

1) Question No. 1 is compulsory.
2) Out of remaining questions, attempt any 4 questions.
3) In all 5 questions to be attempted.
4) All questions carry equal marks.
5) Answer to each new question to be started on a fresh page.
6) Figures in brackets on the right hand side indicate full marks.
7) Assume suitable data if necessary.

Q.1	a)	Explain goal based agent and Utility based agent in detail	03
	b)	Write PEAS description for following task environments:	04
		i) Part picking Robot	
		ii) Medical Diagnosis system	
	c)	Compare BFS and DFS	03
	d)	Prove admissibility and optimality of A* algorithm	04

Q.2	a)	Consider following facts:	07

    1) All hounds howl at night
    2) Anyone who has any cats will not have any mice
    3) Light sleepers do not have anything which howls at night
    4) John has either a cat or hound
    5) If John is a light sleeper then John does not have any mice (conclusion)
    i)   Represent above facts into first order logic
    ii)   Convert FOL statements to conjunctive Normal form
    iii)   Prove the conclusion using resolution

	b)	Explain different approaches to AI	07

Q.3　a)　Explain forward chaining and backward chaining and differentiate between the two.　07

b)　What is the significance of scripts in knowledge representation? Write a complete 07
script for bank robbery.

Q.4　a)　Explain syntactic and semantic analysis in NLP with example.　07

b)　Explain Rote learning and Re enforcement learning.　07

Q.5　a)　Consider a search problem given below. What is the final cost using A* algorithm? 07
Draw queues explicitly at each step.
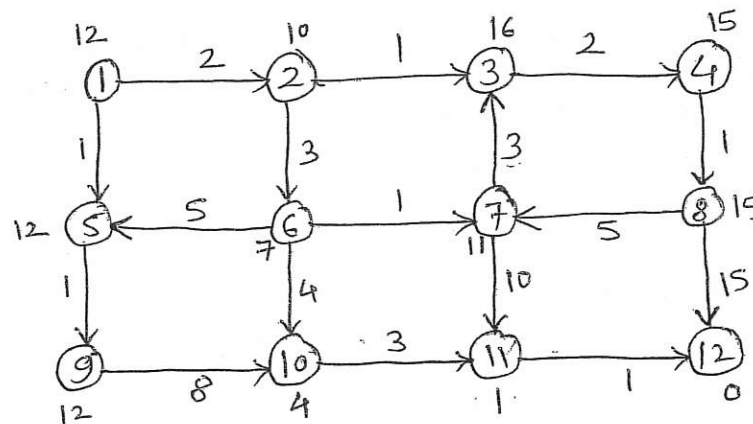
1 is start state.　12 is Goal state.

b)　What is the significance of alpha-beta pruning? Solve using alpha-beta pruning:　07

Q.6 a) You are given two jugs, a 4-gallon one and a 3-gallon one, a pump which has 07 unlimited water which you can use to fill the jug, and the ground on which water may be poured. Neither jug has any measuring markings on it.
What are the steps so that exactly 2 gallon of water in 4 gallon of jug.

b) What is expert system? Draw and Explain generalized architecture of an Expert 07 system.

Q.7 a) Write a note on Iterative deepening search 04

b) Explain Hill climbing in detail 04

c) Explain supervised and unsupervised learning 03

d) What is Unification? What are the conditions for unification? 03
Unify following statement and Find the MGU of
$\{p(b, X, f(g(Z)))$ and $p(Z, f(Y), f(Y))\}$