KATHMANDU UNIVERSITY
End Semester Examination [C]
June 2018

Marks scored:

Level : B.E./B.Sc.
Year : IV

Course : COMP 472
Semester: I

Exam Roll No:

Time: 30 mins.

F.M. : 10

Registration No.:

Date JUN 13 2018

SECTION "A"
[20 Q.×0.5=10 marks]

Pick the correct answer(s)

1. Which one of the following learning unit is responsible for suggesting actions that will lead to new and informative experiences?
   [ ] Problem Generator [ ] Performance element
   [ ] Critic [ ] Learning element

2. Which one of the following is responsible for improving the efficiency of the performance element?
   [ ] Problem Generator [ ] Performance element itself
   [ ] Critic [ ] Learning element

3. Genetic algorithm uses the concept of
   [ ] Hill climbing search [ ] A*search
   [ ] Uniform cost search [ ] Neural search

4. Everyone do not like Iva can be translated as_____ in FOPL
   [ ] $\neg\exists$x Likes(x,Iva) [ ] $\exists$y $\neg$likes(Iva)
   [ ] $\forall$x -$\exists$y Likes(x,Iva) [ ] -$\forall$x $\exists$y Likes(Iva,y)

5. Which of the following is not a syntactically legal sentence of Propositional Logic?
   [ ] m$\wedge$ $\neg$m [ ] (m$\Rightarrow$ (q$\Rightarrow$r)) $\Leftrightarrow$ (s$\Leftarrow$t)
   [ ] $\neg$(q$\vee$r) $\neg$q$\Rightarrow$ $\neg\neg$m [ ] m$\vee$ $\neg$q$\wedge$ $\neg$m$\vee$ $\neg$q$\Rightarrow$m$\vee$q

6. A* algorithm is based on
   [ ] Breadth-First-Search [ ] Depth-First –Search
   [ ] Best-First- Search [ ] Hill climbing

7. Which of the following is a problem that occurs in hill climbing?
   [ ] Cliff [ ] Ridge [ ] Valley [ ] Rock slide

8. What are you predicating by the logic: $\forall$x: $\exists$y: loyalto(x, y).
   [ ] Everyone is loyal to someone [ ] Everyone is loyal to all
   [ ] Everyone is not loyal to someone [ ] Everyone is loyal

9. The traveling salesman problem involves n cities with paths connecting the cities. The time taken for traversing through all the cities, without knowing in advance the length of a minimum tour, is
   [ ] O(n) [ ] O(n2) [ ] O(n!) [ ] O(n/2)

10. What is Transposition rule?
[ ] From P → Q, infer ~Q → P
[ ] From P → Q, infer ~Q → ~P
[ ] From P → Q, infer Q → ~P
[ ] From P → Q, infer Q → P

11. A _____ embodies the criterion for success of an agent's behavior.
[ ] Performance measure
[ ] Rationality
[ ] Efficiency
[ ] Autonomy

12. Rationality at any given time does not depend upon one of the following condition.
[ ] The agent's prior knowledge
[ ] The action that the agent can perform
[ ] The agents percepts sequence till date
[ ] Agent's Omni-scientific capability

13. Which one of the following component does not describe the problem best?
[ ] Initial state [ ] Goal state [ ] Path cost [ ] Abstract state

14. If we find a sentence $\alpha \Rightarrow \beta$ and α in a knowledge base then from that KB we can infer_____ knowledge as Modus Ponen.
[ ] β [ ] α [ ] $-\beta$ [ ] $-\alpha$

15. The environment of a taxi driver agent can be best describe as
[ ] Fully Observable, stochastic, sequential dynamic
[ ] Partially Observable, deterministic, sequential episodic
[ ] Partially Observable, stochastic, sequential dynamic
[ ] Fully Observable, stochastic, sequential semi dynamic

16. If b is the branching factor and d is the depth of the goal node the space complexity of the depth first search algorithm can be expressed in Big O notation as_____
[ ] $O(b^{d+1})$ [ ] $O(b^{d/2})$ [ ] O(bd) [ ] $O(b^{d})$

17. In the model where P implies Q and the contradiction of Q exist, then it infer contradictory of P is explained by
[ ] Modus Ponen
[ ] AND elimination
[ ] Modus Tollen
[ ] Resolution refutation

18. The following relation defines the sibling in prolog.
[ ] sibling(X,Y):-parent(Z,X),parent(Z,Y).
[ ] sibling(X,Y):-parent(Z,X),parent(Y,Z),(X\=Y).
[ ] sibling(X,Y):-parent(Z,X),parent(Z,Y),(X\=Y).
[ ] sibling(X,Y):-parent(Z,X),parent(Y,Z).

19. One of the following properties should be possessed by the machine to pass the total turing test.
[ ] Vision
[ ] Learning
[ ] Knowledge representation
[ ] Natural Language processing

20. Which one of the following agent cannot plan ahead?
[ ] model based agent
[ ] goal based agent
[ ] utility based agent
[ ] Simple reflex agent

KATHMANDU UNIVERSITY
End Semester Examination [C]
June 2018

JUN 13 2018

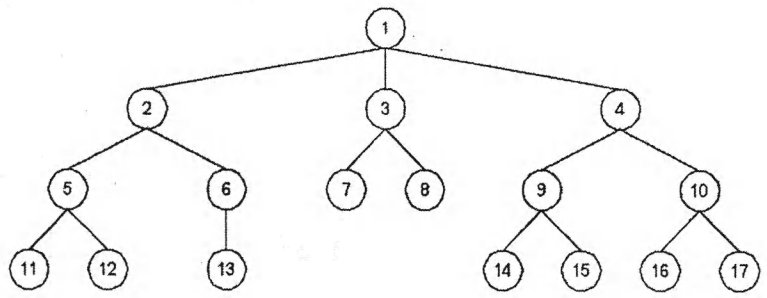
Level : B.E./B.Sc.
Year : IV
Time : 2 hrs. 30 mins.

Course : COMP 472
Semester: I
F.M. : 40

SECTION "B"
[2 Q. × 8=16 marks]

Attempt *ALL* questions

1. For the following tree, list the order in which the nodes are visited for the following Three search strategies and suggest the suitability for each of them.
   a. Depth-First Search
   b. Depth-First Iterative-Deepening Search
   c. Breath-First Search



2. Discuss the typical neural network architecture. Explain how it is different from conventional computing.

SECTION "C"
[6 Q.×4=24 marks]

Attempt any *SIX questions*

3. What is Artificial Intelligence? Explain the applications of Artificial Intelligence.

4. Explain the term plateau, false peaks and ridges in hill climbing search. How can these problems be overcome

5. Formulate the state space for the water jug problem defined as follows: you are given two jug a 4-gallon one and a 3-gallon one a pump which has 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. Your task is to get exactly 2 gallon water on the 4-gallon jug.

6. What do you mean by informed search technique? Explain the term admissible heuristics and monotonicity.

7. What is knowledge Base? How do you represent the knowledge in the computer system?

8. What types of problem are said to be constraint satisfaction problem? Explain how these problems are solved using artificial intelligence.

9. Convert the following sentences into FOPL.
   a. Some painters are not teachers.
   b. Some teacher loves both Bob and Alice.
   c. Some painter loves some teacher.
   d. All painters are teachers.