MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2018/2019ACADEMIC YEAR

SECOND YEAR FIRST   SEMESTER

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COURSE CODE: COM 2106

COURSE TITLE: ARTIFICIAL   INTELLIGENCE

DATE: 13TH DECEMBER 2018   **TIME: 8.30-10.30 A.M**

INSTRUCTIONS:

ATTEMPT QUESTIONS ONE AND ANY OTHER TWO QUESTIONS

Choose the correct answer for the multiple choice questions i-x (10 mark) each question is 1 mark

i. What is Artificial intelligence?
a) Putting your intelligence into Computer
b) Programming with your own intelligence
c)   Making a Machine intelligent
d) Playing a Game
e)   Putting more memory into Computer

ii. Which is not the commonly used programming language for AI?
a. PROLOG
b. Java
c. LISP
d.   Perl
e. Java script

iii. Which instruments are required for perceiving and acting upon the environment?
a) Sensors and Actuators
b) Sensors
c) Perceiver
d) None of the above

iv. Artificial Intelligence has its expansion in the following application. (Mark all that apply

a) Planning and Scheduling
b) Game Playing
c) Diagnosis
d) Robotics
e) All of the above

v. An 'agent' is anything that

a) Perceives its environment through sensors and acting upon that environment through actuators
b) Takes input from the surroundings and uses its intelligence and performs the desired operations
c) A embedded program controlling line following robot
d) All of the mentioned

vi. Web Crawler is a/an

a) Intelligent goal-based agent
b) Problem-solving agent
c) Simple reflex agent
d) Model based agent

vii. The major component/components for measuring the performance of problem solving
a) Completeness
b) Optimality
c) Time and Space complexity
d) Correctness

viii. Which search method takes less memory?
      a) Depth-First Search
      b) Breadth-First search
      c) Both (a) and (b)
      d) Linear Search
      e) Optimal search

ix. Satellite Image Analysis System is (Choose the one that is not applicable).

      a) Episodic
      b) Semi-Static
      c) Single agent
      d) Partially Observable

x. A* algorithm is based on

      a) Breadth-First-Search
      b) Depth-First –Search
      c) Best-First-Search
      d) Hill climbing

b . Give at least 3 examples of different kinds of ambiguity in natural language. (3 marks)

c. Identify three necessary features required for robotic creatures.   (3 marks)

d. When comparing tree-search algorithms, we measure the number of nodes expanded. How many nodes are expanded (in the worst case) by each of the following search techniques when searching a tree with branching factor b to find a goal at a depth of d? You can uses ellipses in your answer to indicate a sequence. Do not use big Oh notation.
(4 marks)

  i.   Breadth-first search:
  ii.   Depth-first search:
  iii.   Depth-limited search (limit = d):
  iv.   Iterative deepening depth-first search:

C. According to Howard Gardner, an American developmental psychologist, the Intelligence comes in multifold ,discuss five types of intelligence   (10 marks)

QUESTION TWO (20 MARKS)

    a. Using a well labeled diagram discuss a goal based agent (10 marks)
    b. Discuss the following terms as used in artificial intelligence (10 marks)
        i.   Iterative deepening
        ii.   Abductive reasoning (abduction)
        iii.   Inductive bias
        iv.   Reinforcement learning
        v.   Genetic programming   is a learning technique.

c. Explain why iterative deepening is considered better than either breadth-first or depth-first search. What is the only problem with iterative deepening? Why is this not considered to be too serious a problem?(5 marks)

QUESTION   THREE (20 marks)

a. What is the shortcoming of hill climbing algorithms? (1 mark)

b. Show the algorithm for depth first search (3 marks)

c. State the advantages and disadvantages of depth first search (5 marks)

d. Discuss the breadth first search mentioning the steps involved (3 marks)

e. State the advantages and disadvantages of breadth-first search (4 marks)

f. Explain four techniques of representing knowledge (4 marks)

QUESTION   FOUR (20 MARKS)

a. Neural networks are capable of learning and they need to be trained, explain three learning strategies that are used.(6 marks)

b. i. Define a robot(1 mark)
   ii. Differentiate Robots and other AI programs (3 marks)

c. Discuss the components of a Robot (5 marks)

d. Natural language processing(NLP) is composed of several steps, discuss the steps   (5 marks)

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