Faculty of Computers & Information, Assiut University
3th Level
Final Exam
Duration: 2 hours

1. الإسم الرباعي (بالعربي فقط) *

نور محمد المختار سيد عوض

2. رقم الجلوس *

162018187

3. المستوي *

◯ الاول

◯ الثاني

🔘 الثالث

○ رابعة 2013

○ رابعة 2014

○ رابعة 2015

○ رابعة 2016

○ رابعة 2017

4. البرنامج *

◉ عام

○ بايو

○ هندسة

5. رقم المعمل *

| ٣ج | ⌄ |

6. رقم الكمبيوتر *

| 19 |

7. الكود (قد تمت مراجعة بيانات الطالب ورقم الجلوس) *

| P+05 |

8. Priority Queues cannot be used to implement BFS?
   a) True
   b) False
   (2 Points)

   ○ a

   ● b

9. The basic idea behind Genetic Algorithms is to work with a population
   a)   of problem solvers that interact with each other through signs.
   b)   of candidate solutions to try and create better candidates by mixing genes.
   c)   of candidate solutions in which each candidate is heuristically refined.
   d)   of problem solvers each of which does an independent heuristic search.
   (2 Points)

   ○ a

   ● b

   ○ c

   ○ d

10. 30.   DFS is time efficient and BFS is space efficient.
    a) True
    b) False
    (2 Points)

    ● a

    ○ b

11. The main function of problem-solving agent is to_____.
    a)   Solve the given problem and reach the goal
    b)   Find out which sequence of action will get it to the goal state.
    c)   Both a & b
    d)   None of the above
    (2 Points)

    ○ a

    ○ b

    ◉ c

    ○ d

12. Genetic Algorithms are
    a)   a class of algorithms that try and build solutions by introducing evolution and selection of the best in a population of candidate solutions
    b)   Methods, based on the theory of natural selection and evolutionary biology, for solving optimisation problems.
    c)   methods for genetically modifying ants to do ant colony optimisation
    d)   a heuristic search method used in artificial intelligence and computing.
    (2 Points)

    ◉ a

    ○ b

    ○ c

    ○ d

13. A heuristic is a method of trying to discover/search or compare?
    (A). To discover something or an idea embedded in a program
    (B). To search and measure how far a node in a search tree seems to be from a goal
    (C). To compare two nodes in a search tree to see if one is better than another
    (D). All of these
    (2 Points)

○ a

○ b

○ c

◉ d

14. Rational agent always does the right things.
   a)   True
   b)   False
   (2 Points)

◉ a

○ b

15. A solution to a problem is a path from the initial state to a goal state. Solution quality is measured by the path cost function, and an optimal solution has the lowest path cost among all solutions.
   a) True
   b) False
   (2 Points)

◉ a

○ b

16. Greedy search strategy chooses the node for expansion in Shallowest
            a) True
            b) False
   (2 Points)

○ a

◉ b

17. Which of the following classifications of the environment are not valid?
   a. Deterministic and non- Deterministic
   b. Observable and partially-observable
   c. Static and dynamic
   d. None of the above
   (2 Points)

   ○ a

   ○ b

   ○ c

   ● d

18. Which of the following is the problem space of means-end analysis?
   (A). One or more initial states and one or more goal state
   (B). One or more initial states and one goal state
   (C). An initial state and one or more goal states
   (D). One initial state and one goal state
   (2 Points)

   ● a

   ○ b

   ○ c

   ○ d

19. The heuristic function calculates the cost of an optimal path between the pair of states.
   a. True   b. False
   (2 Points)

   ● a

   ○ b

20. Iterative deepening search uses only linear space and not much more time than other uninformed algorithms
    a.   True
    b.   False
    (2 Points)

    ◉ a

    ○ b

21. The mechanics of human intelligence investigates in...
    a) sociology
    b) psychology
    c) cognitive science
    d) history
    (2 Points)

    ○ a

    ○ b

    ◉ c

    ○ d

22. Best-First search is a type of informed search, which uses evaluation function ……….
    to choose the best next node for expansion.
    (A). returning lowest evaluation
    (B). returning highest evaluation
    (C). returning lowest and highest evaluation
    (D). None of these
    (2 Points)

    ◉ a

    ○ b

    ○ c

    ○ d

23. Which is used to improve the performance of heuristic search?
   a) Quality of nodes
   b) Quality of heuristic function
   c) Simple form of nodes
   d) None of the mentioned
   (2 Points)

   ○ a

   ◉ b

   ○ c

   ○ d

24. Using a cut can reduce the time used by a program in Prolog
   a. True
   b.False
   (2 Points)

   ◉ a

   ○ b

25. Which is the most straightforward approach for planning algorithm?
         a. Best-first search
         b. State-space search
         c. Depth-first search
         d. Hill-climbing search
   (2 Points)

   ○ a

   ◉ b

   ○ c

   ○ d

26. Which of the following is not true about fitness functions?
    a)   They perform similar role to an objective function
    b)   Maximization of sum of squared residuals is an example of fitness function
    c)   They help in optimization
    d)   All of the above
    (2 Points)

    ○ a

    ◉ b

    ○ c

    ○ d

27. The scope of a variable in Prolog is a single clause (i.e., a fact or rule) or a single query.
    (a) True
    (b) False
    (2 Points)

    ◉ a

    ○ b

28. A genetic algorithm (GA) for optimization is most likely to succeed given
    A.   a small population of fit and similar individuals.
    B.   a large population of fit and similar individuals.
    C.   a small diverse population of fit individuals.
    D.   a large diverse population of fit individuals.
    (2 Points)

    ○ a

    ○ b

    ○ c

    ◉ d

29. uniform-cost search expands the node n with the _____
   a) Heuristic cost
   b) Highest path cost
   c) Average path cost
   d) none of the above
   (2 Points)

○ a

○ b

○ c

◉ d

30. A search algorithm takes _____ as an input and returns _____ as an output.
   a. Input, output
   b. Problem, solution
   c. Solution, problem
   d. Parameters, sequence of actions
   (2 Points)

○ a

◉ b

○ c

○ d

31. The heuristic function is used to solve mathematical problems.
   a.   True   b. False
   (2 Points)

○ a

◉ b

32. The heuristic function does not have any return type.
    a.   True   b. False
    (2 Points)

    ⦿ a

    ○ b

33. An AI agent perceives and acts upon the environment using Sensors and
    Perceiver
    a.   True
    b.   False
    (2 Points)

    ○ a

    ⦿ b

34. What is the use of '=' in prolog programming?
    (a) unification
    (b) arithmetic evaluation
    (c)   reduction
    (d)   None of above
    (2 Points)

    ⦿ a

    ○ b

    ○ c

    ○ d

35. Breadth-first search is not optimal when all step costs are equal, because it always
    expands the shallowest unexpanded node.
    a) True
    b) False
    (2 Points)

○ a

◉ b

36. The space complexity of Depth-first search is O(b^m)
       a) True
        b) False
(2 Points)

○ a

◉ b

37. Which of the following mentioned searches are heuristic searches?
    a.   Random Search
    b.   Depth First Search
    c.   Breadth First Search
    d.   None of the above
(2 Points)

○ a

○ b

○ c

◉ d

38. Select the most appropriate situation for that a blind search can be used.
    a)   Real-life situation
    b)   Small Search Space
    c)   Complex game
    d)   All of the above
(2 Points)

○ a

○ b

○ c

◉ d

39. The heuristic function takes parameters of type string and returns an integer value.
    a.   True   b. False
    (2 Points)

○ a

◉ b

40. Problem formulation usually requires abstracting away real-world details to define
    a state space that can feasibly be explored
    a.   True
    b.   False
    (2 Points)

◉ a

○ b

41. Genetic algorithms involve which of the following phenomena ?
    a.   Mutation
    b.   Cross over
    c.   Selection
    d.   All of the above
    (2 Points)

○ a

○ b

○ c

◉ d

42. Artificial intelligence means putting your intelligence into Computer
    a.   True
    b.   False
    (2 Points)

    ○ a

    ◉ b

43. Which search is complete and optimal when h(n) is consistent?
    a) Best-first search
    b) Depth-first search
    c) Both Best-first & Depth-first search
    d) A* search
    (2 Points)

    ○ a

    ○ b

    ○ c

    ◉ d

44. Which data structure conveniently used to implement BFS?
    a.   Stacks
    b.   Queues
    c.   Priority Queues
    d.   All of the mentioned
    (2 Points)

    ○ a

    ◉ b

    ○ c

    ○ d

45. Which of the following is not a goal of AI?
    a. Thinking humanly   b. Adapting to the environment and situations
    c. Real Life Problem Solving d. None of the above
    (2 Points)

    ○ a

    ○ b

    ○ c

    ◉ d

46. A* is optimal if h(n) is not admissible heuristic.
        a) True
        b) False
    (2 Points)

    ○ a

    ◉ b

47. Which of the mentioned parts of an agent would you consider to be the most
    valuable in terms of AI?
    a. Sensors and Actuators   b.Wheels and steering
    c. Arms and legsd.   d.All of the above
    (2 Points)

    ◉ a

    ○ b

    ○ c

    ○ d

48. The name "best-first search" is a good algorithm but an inaccurate one. After all, if we could actually enlarge the best node first, it would not be a search at all; it would be a straight march to the goal. All we can do is to select the node that seems to be best according to the evaluation function.
(A). True
(B). False
(2 Points)

- ⦿ a

- ◯ b

49. Which of the following is the advantage of declarative languages over imperative languages?
      (a) Can use abstract data type; (b) Easy to verify the properties of the program;
      (c) Is more efficient;   (d) Can be implemented by an interpreter or compiler
(2 Points)

- ◯ a

- ⦿ b

- ◯ c

- ◯ d

50. Which rule is applied for the Simple reflex agent?
    a)   Simple-action rule
    b)   Simple & Condition-action rule
    c)   Condition-action rule
    d)   None of the above
(2 Points)

- ◯ a

- ◯ b

- ⦿ c

○ d

51. what is the use of 'is' in prolog programming?
   (a) unification
   (b) arithmetic evaluation
   (c) reduction
   (d) None of above
   (2 Points)

   ○ a

   ◉ b

   ○ c

   ○ d

52. A* algorithm is based on which of the following?
   (A). Breadth-First-Search
   (B). Depth-First –Search
   (C). Best-First-Search
   (D). Hill climbing
   (2 Points)

   ○ a

   ○ b

   ◉ c

   ○ d

53. An algorithm A is considered as an admissible if it?
   (A). not guaranteed to return an optimal solution when one exists
   (B). guarantees to return more optimal solutions
   (C). returns more solutions, but not an optimal one
   (D). guaranteed to return an optimal solution when one exists
   (2 Points)

   ○

○ a

○ b

○ c

◉ d

54. Heuristic function h(n) is cheapest path from root to goal node
   a) True
   b) False
(2 Points)

○ a

◉ b

55. Which of the following is not Uninformed Search technique?
 a) Breadth First Search (BFS)
 b) Depth First Search (DFS)
 c) Bidirectional Search
 d) none of the above
(2 Points)

○ a

○ b

○ c

◉ d

56. What is the other name of informed search strategy?
   a. Simple search   c. Online search
   b. Depth-first search   d. None of the mentioned
(2 Points)

○ a

○

○ b

○ c

◉ d

57. The heuristic function h(n) is which of the following?
   (A). Lowest path cost
   (B). The cheapest path from the root to the goal node
   (C). The estimated cost of the cheapest path from the root node to the goal node
   (D). Average path cost
   (2 Points)

○ a

○ b

◉ c

○ d