These are sample MCQs to indicate pattern, may or may not appear in examination

**University of Mumbai**
**Online Examination 2020**

Program: BE Computer Engineering
Curriculum Scheme : Revised 2016
Examination: Final Year Semester : VII
Course Code:CSC703 and Course Name: Artificial Intelligence and Soft Computing

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| Time: 1hour | Max. Marks: 50 |
| | **Note to the students:-** All the Questions are compulsory and carry equal marks . |
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| Q1. | _____ is the art and science of developing intelligent machines. |
| Option A: | Machine Intelligence |
| Option B: | Artificial Intelligence |
| Option C: | Hard Computing |
| Option D: | Soft Computing |
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| Q2. | What is the other name of informed search strategy? |
| Option A: | Simple search |
| Option B: | Heuristic search |
| Option C: | Online search |
| Option D: | None of These |
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| Q3. | What is the heuristic function of greedy best-first search? |
| Option A: | f(n) != h(n) |
| Option B: | f(n) < h(n) |
| Option C: | f(n) = h(n) |
| Option D: | f(n) > h(n) |
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| Q4. | Which search is complete and optimal when h(n) is consistent? |
| Option A: | Best-first search |
| Option B: | Depth-first search |
| Option C: | Both Best-first & Depth-first search |

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| Option D: | A* search |
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| Q5. | Which search method will expand the node that is closest to the goal? |
| Option A: | Best-first search |
| Option B: | Greedy best-first search |
| Option C: | A* search |
| Option D: | None of these |
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| Q6. | What among the following could the universal instantiation of _____ For all x King(x) ^ Greedy(x) => Evil(x) |
| Option A: | King(John) ^ Greedy(John) => Evil(John) |
| Option B: | King(y) ^ Greedy(y) => Evil(y) |
| Option C: | King(Richard) ^ Greedy(Richard) => Evil(Richard) |
| Option D: | All of the mentioned |
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| Q7. | Heuristic function h(n) is _____ |
| Option A: | Lowest path cost |
| Option B: | Cheapest path from root to goal node |
| Option C: | Estimated cost of cheapest path from root to goal node |
| Option D: | Average path cost |
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| Q8. | Forward chaining systems are _____ where as backward chaining systems are _____ |
| Option A: | Goal-driven, goal-driven |
| Option B: | Goal-driven, data-driven |
| Option C: | Data-driven, goal-driven |
| Option D: | Data-driven, data-driven |
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| Q9. | Inference algorithm is complete only if _____ |
| Option A: | It can derive any sentence |
| Option B: | It can derive any sentence that is an entailed version |
| Option C: | It is truth preserving |

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| Option D: | It can derive any sentence that is an entailed version & It is truth preserving |
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| Q10. | Which of the following is not the style of inference? |
| Option A: | Forward Chaining |
| Option B: | Backward Chaining |
| Option C: | Resolution Refutation |
| Option D: | Modus Ponen |
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| Q11. | Which among the following could the Existential instantiation of ∃x Crown(x) ^ OnHead(x, Johnny)? |
| Option A: | Crown(John) ^ OnHead(John, Jonny) |
| Option B: | Crown(y) ^ OnHead(y, y, x) |
| Option C: | Crown(x) ^ OnHead(x, Jonny) |
| Option D: | None of these. |
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| Q12. | What is Fuzzy Logic? |
| Option A: | a method of reasoning that resembles human reasoning |
| Option B: | a method of question that resembles human answer |
| Option C: | method of giving answer that resembles human answer. |
| Option D: | a method of giving answer that resembles machine answer. |
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| Q13. | The height h(A) of a fuzzy set A is defined as h(A) = sup A(x) |
| Option A: | h(A) = 0 |
| Option B: | h(A) <0 |
| Option C: | h(A)=1 |
| Option D: | h(A)<1 |
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| Q14. | What are the following sequence of steps taken in designing a fuzzy logic machine ? |
| Option A: | Fuzzification → Rule evaluation → Defuzzification |

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| Option B: | Fuzzification → Defuzzification → Rule evaluation |
| Option C: | Rule evaluation → Fuzzification → Defuzzification |
| Option D: | Rule evaluation → Defuzzification → Fuzzification |
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| Q15. | If A and B are two fuzzy sets with membership functions ?A(x) = {0.6, 0.5, 0.1, 0.7, 0.8} ?B(x) = {0.9, 0.2, 0.6, 0.8, 0.5} Then the value of ? Complement A?B(x) will be |
| Option A: | {0.9, 0.5, 0.6, 0.8, 0.8} |
| Option B: | {0.6, 0.2, 0.1, 0.7, 0.5} |
| Option C: | {0.1, 0.5, 0.4, 0.2, 0.2} |
| Option D: | {0.1,0.5,0.4,0.2,0.3} |
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| Q16. | Consider a fuzzy set old as defined below old={(20,0),(30,0.2),(40,0.4),(50,0.6),(60,0.8),(70,1),(80,1)}. Then the alpha-cut for alpha=0.4 for the set old will be |
| Option A: | {(40,0.3)} |
| Option B: | {50,60,70,80} |
| Option C: | {(20,0.1),(30,0.2)} |
| Option D: | {(20,0),(30,0),(40,1),(50,1),(60,1),(70,1),(80,1)} |
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| Q17. | The height h(A) of a fuzzy set A is defined as h(A) =sup A(x) where x belongs to A. Then the fuzzy set A is called normal when |
| Option A: | h(A)=0 |
| Option B: | h(A)<0 |
| Option C: | h(A)=1 |
| Option D: | h(A)<1 |
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| Q18. | which boolean function we can not implement by using McCulloch Pitt neuron model? |
| Option A: | AND |
| Option B: | XOR |
| Option C: | OR |

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| Option D: | NOT |
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| Q19. | Which are the following optimization are derivative based? |
| Option A: | Random search |
| Option B: | Down Hill simplex |
| Option C: | Newton Method |
| Option D: | Pattern search |
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| Q20. | What is mean by gradient? |
| Option A: | A gradient measures how much the output of a function changes if you change the inputs a little bit |
| Option B: | A gradient measures how much the output of a function changes if you increase the inputs a little bit |
| Option C: | A gradient measures how much the output of a function changes if you decrease the inputs a little bit |
| Option D: | A gradient measures how much the input of a function changes if you change the output a little bit |
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| Q21. | What is the objective of backpropagation algorithm? |
| Option A: | to develop learning algorithm for multilayer feedforward neural network |
| Option B: | to develop learning algorithm for single layer feedforward neural network |
| Option C: | to develop learning algorithm for multilayer feedforward neural network, so that network can be trained to capture the mapping im |
| Option D: | none of these |
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| Q22. | Determine the weights after first step of training for perceptron learning rule of a single neuron network starting with initial weights w= [0 0], inputs as X1 = [2 2], X2 = [1 -2], X3 = [-2 2], X4= [-1 1] and d1 = 0, d2 = 1 , d3 = 0 and d4 = 1. The learning rate c =1. Use Binary bipolar activation function. |
| Option A: | [-2 -2] |
| Option B: | [2 2] |
| Option C: | [2 -2] |

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| Option D: | [-2 2] |
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| Q23. | Calculate weights after first iteration using delta learning rule for λ= 1, c=0.25 (learning rate). Train the network using following data pairs- X1= [2 0 -1], d1 = -1 and X2 = [1 -2 -1], d2 = 1. The initial weights are W1 = [1 0 1]. |
| Option A: | [0.713 0 1.1437] |
| Option B: | [0.113 0 0.1437] |
| Option C: | [0.213 0 0.1437] |
| Option D: | [0.313 0 1.1437] |
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| Q24. | In a single perceptron, the updation rule of weight vector is given by |
| Option A: | $w(n+1)=w(n)+\eta[d(n)-y(n)]$ |
| Option B: | $w(n+1)=w(n)-\eta[d(n)-y(n)]$ |
| Option C: | $w(n+1)=w(n)+\eta[d(n)-y(n)]* x(n)$ |
| Option D: | $w(n+1)=w(n)-\eta[d(n)-y(n)]* x(n)$ |
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| Q25. | Which of the following are Components of Expert Systems? |
| Option A: | Knowledge Base |
| Option B: | Inference Engine |
| Option C: | User Interface |
| Option D: | All of the above |

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