Questions for Preparation of Intelligent System's Final Exam

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1. Differentiate between Artificial Intelligence and Intelligent System.
2. Explain components of an Expert System, draw a diagram as well to elaborate.
3. Compare early AI systems with modern AI systems.
4. Explain the role of knowledge in AI systems.
5. Differentiate between expert system and intelligent agent.
6. Explain different roles in the development team of an Expert System.
7. Describe some early expert systems.
8. How demon-triggered systems work?
9. Compare rule-based systems and frame-based systems.
10. Give a real-world example of frame-based expert systems and demon triggered.
11. What are some latest healthcare expert system which are substitute of MYCIN expert system?
12. Differentiate between human agent, robot agent and soft agent.
13. Describe role of actuators and sensors in an agent.
14. What is a model-based agent? Give an example.
15. What are learning-based agents and how they are different from goal-based agents.
16. A smart thermostat is an example for which type of agent?
17. Why are utility-based agents smarter?
18. Differentiate between explicit and implicit knowledge.
19. Explain shallow learning and deep learning.
20. What is declarative knowledge? Why we use it?
21. Finding maximum number in a list is an example for what type of knowledge? Declarative or procedural? Justify your answer as well.
22. What are some example for reflexive knowledge?
23. A knowledge-based system is also an expert system? If yes, then give reason.
24. What languages we can use to build an expert system?
25. Consider the following facts in Prolog:
    parent(ali, ahmed).
    parent(ali, sara).
    parent(ahmed, hamza).

Write a Prolog rule for grandparent(X,Y) and show the query to find the grandparent of hamza. What will be the output?

26. What is Web Ontology Language (OWL)?
27. Given the following Prolog knowledge base:
    male(ali).
    female(sara).
    parent(ali, sara).

Write a rule father(X,Y) and write the query to find the father of sara. What result will Prolog return?

28. Explain Resource Description Framework (RDF).
29. Explain machine learning framework such as Tensorflow and Pytorch.
30. Describe two tools that we can use for Natural Language Processing (NLP).
31. What is relational database and its role in Expert systems.
32. How matplotlib is different from seaborn library?

33. Explain soft computing and its goals.
34. What is classical logic and why it is called crisp logic as well.
35. Can we handle imprecision in the fuzzy systems?
36. Explain fuzzy sets with an example of a figure.
37. Describe common types of membership functions of fuzzy sets.
38. What is Gaussian membership function in fuzzy sets. Can you show it with the help of a figure?
39. Air Conditioning is an example of fuzzy system? If yes, then give reason for it.
40. Explain role of fuzzy logic systems in agriculture.
41. What is artificial neural network (ANN)?
42. How working neural network is similar to biological neurons?
43. Describe working of a human brain.
44. Explain neuron as a function.
45. Difference between perceptron and Multi-layer perceptron (MLP).
46. Explain role of weights and biases in artificial neural network (ANN).
47. What is activation function in artificial neural network (ANN)?
48. What is multi-layer perceptron (MLP) and can we use it for classification and regression?
49. Explain four different types of artificial neural network (ANN).
50. Give some pros and cons of artificial neural network (ANN).
51. What is a convolutional neural network (CNN)?
52. What is Natural Language Processing (NLP)?
53. Mention some applications and benefits of Natural Language Processing (NLP).
54. What are different steps to perform in Natural Language Processing (NLP).?
55. How you explain difference between syntax and semantic analysis in Natural Language Processing (NLP).
56. ***"Ali went to the bank. He deposited money. It was very crowded, so he felt tired".*** Perform lexical and syntax analysis of the above statement.
57. What is feature extraction in Natural Language Processing (NLP) and how we perform it?
58. How many steps are involved in text preprocessing process of Natural Language Processing (NLP)?
59. What is lemmatization? Give an example.
60. What is tokenization? Give an example.
61. Explain three methods to perform feature extraction in Natural Language Processing (NLP).
62. What are some latest models in the field of Natural Language Processing (NLP)?
63. What are transformers? Are they traditional or latest models for NLP?
64. Explain future of Natural Language Processing (NLP) and also mention some challenges faces by this field.
65. What is unsupervised learning useful for?
66. Mention four different types of machine learning approaches.
67. Difference between clustering and hierarchical clustering.
68. Mention some applications for hierarchical clustering.
69. What is K-mean clustering?
70. What is difference between K-mean and KNN (K-nearest neighbors)?
71. Explain dimensionality reduction.
72. Difference between Principal component analysis (PCA) and Autoencoders.
73. Explain working mechanism of Autoencoders.
74. What is back propagation?
75. What is forward propagation?
76. Discuss the future of Artificial Intelligence and identify the major emerging areas where AI is expected to play a significant role.

77. Discuss ethical considerations that must be addressed in AI development.
78. Explain components of a deep learning model.
79. All neural networks are deep learning model or not? Elaborate.
80. Give an example for forward propagation.
81. Explain role of a loss function in deep learning.
82. What is gradient decent in deep learning. Draw a graph to explain it.
83. Explain two different types of Recurrent Neural Network (RNN).
84. What is generative adversarial network (GAN).
85. Difference between overfitting and overfitting.
86. Explain some real world example for deep learning and also mention its limitations.
87. What algorithm we can use for optimization problem?
88. What is genetic algorithm? Explain role of chromosome, fitness function and population in it.
89. Explain evolutionary strategies.
90. Describe various elements of reinforcement learning.
91. What is reward concept in reinforcement learning? Explain with an example.
92. What is Policy in reinforcement learning?
93. What is supervised learning algorithm? Can you explain any one supervised learning method?
94. Why is semi-supervised learning useful in machine learning?
95. Difference between value and Q-value function in Reinforcement learning.
96. Explain three main approaches for reinforcement learning.
97. What is Q-learning?
98. Do you know about DeepMind AlphaGo?
99. Give some real-world applications of decision trees and Bayesian belief network (BNN)?
100. What is learning in Bayesian belief network (BNN)?