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UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 8 Examination in Engineering: July 2022

Module Number: EE8210

Module Name: Intelligent Systems Design

Part - A

[30 Minutes]

[This paper consists of 4 pages.]

Instructions for candidates

- Write your index number of top of every page
- Question paper contains 15 multiple choice questions
- Answer all questions. Each question has only one answer
- For each question, put an X mark on the letter: (a), (b), (c), or (d) which corresponds to the correct answer, by using a black or blue pen
- Each question carries equal marks. Total marks allocated for 15 MCQ questions is 10 marks

-
1. Out of the following, which is NOT a rule based expert system?
 - (a) DENDRAL
 - (b) MYCIN
 - (c) ENIGMA
 - (d) PROSPECTOR
 2. Which out of the following is NOT True about Forward chaining?
 - (a) Forward chaining is also called data driven reasoning
 - (b) Forward chaining is a technique for gathering information and then inferring from it whatever can be inferred
 - (c) In forward chaining, many rules may be executed that have nothing to do with the established goal
 - (d) If our goal is to infer only one particular fact, the forward chaining inference technique would be more effective

3. "In a backward chaining system, we begin with some hypotheses, we try to prove the hypothesis, and try to find the rules that would allow us to determine that hypothesis." What is your conclusion about the above sentence?
- (a) True
 - (b) False
 - (c) Partially true
 - (d) Insufficient information to conclude
4. What is the consequent of the following rule?
- IF Age > 60
AND Service > 20
THEN "Provide Pension"
- (a) Age > 60
 - (b) Provide Pension
 - (c) Service > 20
 - (d) Age > 60 AND Service > 20
5. Which is NOT a key component of a rule based expert system?
- (a) Knowledge Base
 - (b) Database
 - (c) Inference Engine
 - (d) Developer Interface
6. The Fuzzy set $\{x \mid \mu_A(x) = 1\}$ is the
- (a) Support of A
 - (b) Core of A
 - (c) α -cut of A
 - (d) Maximum of A
7. In the linguistic (Mamdani) fuzzy model "If x is A then y is B", the fuzzy proposition "x is A" is the ...
- (a) consequent
 - (b) kernel
 - (c) antecedent
 - (d) input
8. A method not used for defuzzification is
- (a) Center of Gravity
 - (b) Minimum of Maximums
 - (c) Mean of Maximum
 - (d) Center Average

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9. The fuzzy operation $\mu_{A \cup B}(x) = \max(\mu_A(x), \mu_B(x))$ is
- (a) AND operation
 - (b) OR operation
 - (c) Lukasiewicz OR
 - (d) NOT operation
10. The inference method given in Figure Q10 is
- (a) Mamdani's Minimum
 - (b) Drastic Product
 - (c) Bounded Product
 - (d) Larsen's Product

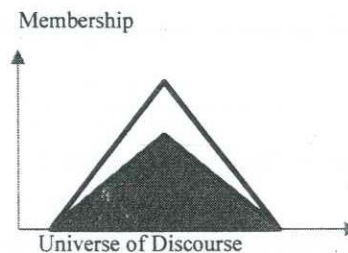


Figure Q10

11. What is the basic concept of a Recurrent Neural Network (RNN)?
- (a) Use previous inputs to find the next output according to the training set.
 - (b) Use loops between the most important features to predict the next output.
 - (c) Use recurrent features from the dataset to find the best answers
 - (d) Use a loop between inputs and outputs to achieve a better prediction.
12. For what is RNN used for and achieves the best results for?
- (a) Handwriting and speech recognition
 - (b) Handwriting and images recognition
 - (c) Financial predictions
 - (d) Speech and images recognition
13. One of the RNN's issues is "Exploding Gradients". What is that?
- (a) When the algorithm assigns a unnecessarily high importance to the weights, when your data is too small.
 - (b) When the algorithm assigns a unnecessarily high importance to the weights, because the better features.
 - (c) When the algorithm assigns a unnecessarily high importance to the weights, when your dataset is too big.
 - (d) When the algorithm assigns a unnecessarily high importance to the weights, without much reason

14. What is Long short-term memory (LSTM)?

- (a) LSTM networks are an extension of RNN, which basically extends their memory. Therefore it is not recommended to use it, unless you are using a small Dataset.
- (b) LSTM networks are an extension of RNN, which basically extends their memory. Therefore it is well suited to learn from important experiences that have very long time lags in between.
- (c) LSTM networks are an extension of RNN, which basically shorten their memory. Therefore it is well suited to learn from important experiences that have very low time lags in between.
- (d) LSTM networks are an extension of RNN, which basically extends their memory. Therefore it is well suited to learn from important experiences that have very low time lags in between.

15. Which answer explains better the convolution in Convolutional Neural Network (CNN)?

- (a) Understand the model features and select the best.
- (b) It is a technique to standardize the dataset.
- (c) It is the first step of using CNN.
- (d) Detect key features in images, respecting their spatial boundaries.