

Total No. of Questions : 5]

SEAT No. :

P3351

[Total No. of Pages : 5

[6027]-34

Second Year M.C.A. (Management Faculty)
IT - 34 : KNOWLEDGE REPRESENTATION
AND ARTIFICIAL INTELLIGENCE : ML, DL
(2020 Pattern) (Semester - III)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *For MCQ select appropriate choice from options given.*
- 3) *From Q.2 to Q.5 having Internal choice.*
- 4) *Figures to the right indicate full marks.*

Q1) Multiple Choice Questions:

[20×½=10]

- a) Which of the following can improve the performance of AI Agent?
 - i) Perceiving
 - ii) Learning
 - iii) Observing
 - iv) Thinking Irrationally
- b) Which of the following is not a limitation of AI?
 - i) High Cost
 - ii) Lacking Creativity
 - iii) High Accuracy
 - iv) Unemployment
- c) In Wumpus world the knowledge based agent start from location
 - i) Room [1, 1]
 - ii) Room [2, 2]
 - iii) Room [1,2]
 - iv) Room [4,4]
- d) The symbolization for a conjunction is:
 - i) $p \rightarrow q$
 - ii) $p \wedge q$
 - iii) $p \vee q$
 - iv) $\sim p$
- e) In propositional logic, given P and $P \rightarrow Q$, we can infer
 - i) $\sim Q$
 - ii) $P \wedge Q$
 - iii) Q
 - iv) $\sim P \wedge Q$
- f) Resolution refutation method removes which logical symbol from given expression.
 - i) \wedge (AND)
 - ii) \vee (OR)
 - iii) \Rightarrow Implication
 - iv) \neg (NOT)

P.T.O.

- g) Which distance metric (s) are suitable for categorical variables to find the closest neighbors.
- i) Euclidean Distance
 - ii) Manhattan Distance
 - iii) Minkowski Distance
 - iv) Hamming Distance
- h) Which of the following measures is optional for comparing the goodness of the fit of competing regression models involving the same dependent variable?
- i) The Intercept
 - ii) The coefficient
 - iii) R-square
 - iv) Standard Deviation of the residuals
- i) Logistic regression is a _____ regression technique that is used to model data having a _____ outcome.
- i) Linear, Numeric
 - ii) Linear, Binary
 - iii) Nonlinear, Numeric
 - iv) Nonlinear, binary
- j) The correlation coefficient for two real-valued attributes is 0.85. What does this value tell?
- i) The attributes are not linearly related
 - ii) As the value of one attribute increases the value of second attribute also increases
 - iii) As the value of one attribute decrease the value of second attribute increases
 - iv) The attribute show a curvilinear relationship
- k) In model based learning methods, an iterative process take places on the ML models that are built, based on various model parameters called?
- i) Mini-Batches
 - ii) Optimized parameters
 - iii) Hyper parameters
 - iv) Super parameters
- l) In which of the following learning the teacher returns reward and punishment to learner?
- i) Active learning
 - ii) Reinforcement learning
 - iii) Supervised learning
 - iv) Unsupervised learning

- m) The most common Neural networks consist of _____ network layers.
- i) 1
 - ii) 2
 - iii) 3
 - iv) 4
- n) Which layer is the most important layers where features extraction take place, and adjustments are made to train faster and function better.
- i) Input layer
 - ii) Output layer
 - iii) Hidden layer
 - iv) None of these
- o) Which strategy does not prevent a model from over-fitting to the training data?
- i) Early stopping
 - ii) Dropout
 - iii) Data Augmentations
 - iv) Pooling
- p) Weight sharing occurs in which neural network architecture?
- i) CNN
 - ii) RNN
 - iii) Fully connected Neural Network
 - iv) CNN & RNN
- q) ANN used for:
- i) Pattern Recognition
 - ii) Classification
 - iii) Clustering
 - iv) All of these
- r) It is the difference between the validation error and training error.
- i) Std Dev
 - ii) Variance
 - iii) Dispersion
 - iv) Bias
- s) Chatbot is based on which AI technique?
- i) Big data
 - ii) Robotics
 - iii) Deep learning
 - iv) NLP
- t) What are the devices that sense the physical environments?
- i) Control unit
 - ii) Sensors
 - iii) CPU
 - iv) Firmware

Q2) a) What is knowledge representation? Explain the different techniques of KR. [4]

b) Consider the following. [6]

“As per the law, it is a crime for an American to sell weapons to hostile nation country an enemy of America, has some missiles, & all the missiles were sold to it by Robert, who is an American Citizen” Prove that “Robert is Criminal” using forward chaining algorithm.

OR

a) Why do we need Artificial Intelligence? [4]

b) Write a FOL of following statement. [6]

i) Mary loves everyone.

ii) No one talks.

iii) Everyone loves everyone.

iv) Everyone loves everyone except himself.

v) Someone loves everyone.

vi) Someone walks and someone talks.

Q3) a) State the Mathematical formulation of the SVM. [4]

b) Suppose 10000 patients get tested for covid-19, out of them, 9000 are actually healthy and 1000 are actually sick. For the sick people, a test was positive for 620 and negative for 380. For healthy people, the same test was positive for 180 and negative for 8820. Construct a confusion matrix for data and compute precision & recall for the data. [6]

OR

a) How SVM can be used for classification of linearly separable data? [4]

b) Use K-means clustering to cluster the following data into two groups. Assume cluster centroid are $m_1 = 2$ and $m_2 = 4$. The distance function used is Euclidean distance.

{2, 4, 10, 12, 3, 20, 30, 11, 25} [6]

Q4) a) Explain the use of Long Short Term Memory (LSTM). [4]

b) Why do we use pooling layers in CNN? [4]

c) Explain ANN. [2]

OR

a) Explain Convolutional Neural Network (CNN). [4]

b) Why do we prefer CNN over ANN for image data as input? [6]

Q5) Write a short notes on

[10]

- a) Issues in knowledge representation.
- b) Random forest.
- c) Building Block of DL.
- d) FPGA
- e) Speech recognition.

OR

- a) List out type of AI.
- b) Advantage of Logistic Regression.
- c) Detection in Deep learning.
- d) GPU
- e) Chatbot.

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