Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

CA5EL52 Machine Learning

Programme: BCA+MCA (Integrated)/MCA | Branch/Specialisation: Computer Application

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Which of the following CANNOT be achieved by using machine learning? **1**

(a) Forecast the outcome variable into the future.
(b) Classify respondents into groups based on their response pattern.
(c) Proving causal relationships between variables.
(d) Accurately predict the outcome using supervised learning algorithms

ii. We can define this probability as P(A|B) = P(B,A) *P(A) / P(B) if P(B) > 0- **1**

(a) Conditional probability (b) Marginal probability
(c) Bayes probability (d) Normal probability

iii. We want to come up with a classifier that classifies each news article into one of the following categories: politics, sports, entertainment. Is this a classification problem or a regression problem? **1**

(a) Classification (b) Regression
(c) Both (a) and (b) (d) None of these

iv. Learning to navigate a robot- **1**

(a) Supervised learning (b) Unsupervised learning
(c) Reinforcement learning (d) Sem-supervised learning

v. What is the minimum no. of variables/ features required to perform clustering? **1**

(a) 0 (b) 1 (c) 2 (d) 3

P.T.O.

vi. Which distance function is used in KMean? **1**
(a) Euclidian distance
(b) Manhattan distance
(c) Kolmogorov Smirnov Distance
(d) None of these

vii. Which of the following ensemble model helps in reducing variance? **1**
(a) Addaboost (b) Bootstrap aggregation
(c) Stacking (d) Voting

viii. Frequency of occurrence of an itemset is called as _____. **1**
(a) Support (b) Confidence
(c) Support Count (d) Rules

ix. Which activation function is not used in neural network? **1**
(a) ReLU (b) Sigmoid
(c) Slutsky (d) tanh

x. Total number of parameters in AlexNet model- **1**
(a) 56 million (b) 57 million
(c) 59 million (d) 60 million

Q.2 i. Write down the importance of deep learning? **2**
ii. Write down any three application of machine learning. **3**
iii. Differentiate ML and DL on any five parameters. **5**
OR iv. What is reinforcement learning. Write down any three application of reinforcement learning. **5**

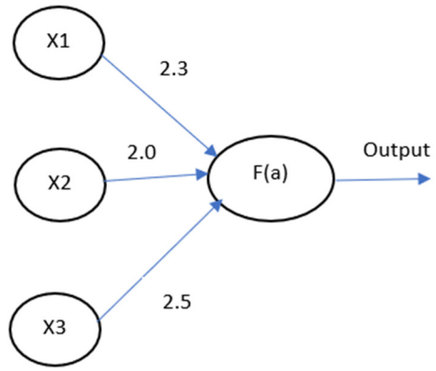
Q.3 i. What is supervised and unsupervised learning. **2**
ii. Explain the following terms: **8**
(a) Regularization (b) Overfitting
(c) Underfitting (d) Variance
OR iii. Explain the support vector machine in detail. **8**

Q.4 i. What is principal component analysis? **2**
ii. For following data point: **8**
(8,7),(1,4),(2,2),(6,7),(3,4),(8,6). Where centroid are C1(2,3) & C2 (8,6). Perform K-Mean clustering algorithm until Second iteration and find out at what cluster (3,4) will be?

OR iii. Explain the following terms: **8**
(a) LDA (b) Dimensionality reduction
(c) Association rule (d) Reinforcement Learning

Q.5 i. Define ensemble methods. **4**
ii. Explain bootstrap aggregation vs boosting in detail. **6**
OR iii. Describe K-Fold cross validation method in detail. **6**

Q.6 i. What is backpropagation in deep learning? **2**
ii. In the given neural network where x1, x2, x3 are 1,-1,-2. And use tanh activation function F(a), Find the output. **8**



OR iii. What is CNN. Explain any three model of CNN. **8**

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Marking Scheme
CA5EL52 Machine Learning

Q.1	i)	Which of the following CANNOT be achieved by using machine learning? (c) proving causal relationships between variables.	**1**
	ii)	We can define this probability as P(A|B) = P(B,A) *P(A) / P(B) if P(B) > 0 (c) Bayes probability	**1**
	iii)	We want to come up with a classifier that classifies each news article into one of the following categories: politics, sports, entertainment. Is this a classification problem or a regression problem? (a) Classification	**1**
	iv)	Learning to Navigate a Robot (c) Reinforcement learning	**1**
	v)	What is the minimum no. of variables/ features required to perform clustering? (b) 1	**1**
	vi)	Which distance function is used in KMean (a) Euclidian distance	**1**
	vii)	Which of the following ensemble model helps in reducing variance? b) Bootstrap Aggregation	**1**
	viii)	Frequency of occurrence of an itemset is called as _____ (a) Support	**1**
	ix)	Which activation function is not used in Neural network? (c) Slutsky	**1**
	x)	Total Number of Parameter in AlexNet Model (d) 60 million	**1**
Q.2	i.	Write down the importance of Deep learning? Definition -2 marks	**2**
	ii.	Write down any three Application of Machine Learning Each application is of 1 Marks each.	**3**
	iii.	Differentiate ML and DL on any five parameters Each Difference will be of 1 Marks each	**5**
OR	iv.	What is Reinforcement Learning. Write down any three Application of reinforcement learning Definition is of 2 marks and Application is of three Marks	**5**
Q.3	i.	What is supervised and Unsupervised Learning Each parts is of 1 Marks each	**2**
	ii.	Explain the following terms:- (a) Regularization (b) Overfitting (c) Underfitting (d) Variance Each term is of 2 Marks each	**8**
OR	iii.	Explain the Support vector Machine in details Equation, theory diagram, objective function each will be of 2 Marks each	**8**
Q.4	i.	What is Principal component Analysis? Theory wll be of 2 Marks	**2**
	ii.	For following data point: (8,7),(1,4),(2,2),(6,7),(3,4),(8,6). Where centroid are C1(2,3) & C2 (8,6). Perform K-Mean clustering algorithm until Second iteration and find out at what cluster (3,4) will be? Each iteration is of 3 Marks each Final answer representation is of 2 Marks	**8**
OR	iii.	Explain the following terms: (a) LDA (b) Dimensionality reduction (c) Association rule (d) Reinforcement Learning Each term is of 2 Marks each	**8**
Q.5	i.	Define Ensemble methods. Diagram and Theory is of 2 Marks each	**4**
	ii.	Explain Bootstrap Aggregation vs Boosting in details Each definition if of 3 Marks each	**6**
OR	iii.	Describe K-Fold Cross validation method in details Diagram and Theory each will be of 3 Marks each	**6**
Q.6	i.	What is backpropagation in Deep Learning? Definition -2 Marks	**2**
	ii.	In the given neural network where x1, x2, x3 are 1,-1,-2. And use tanh activation function F(a), Find the Output.	**8**

Summation layer is of 4 Marks
Output layer is of 4 Marks

iii. What is CNN. Explain any 3 model of CNN. **8**
Each model and definition is of 2 Marks each

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