University of Mumbai
Program: Master of Computer Applications
Curriculum Scheme: MCA 2 YEAR COURSE
Examination: MCA First Year   Semester - II
Course Code: MCA22 and Course Name: Artificial Intelligence and Machine Learning

Time: 2 Hrs 30 Mins   **Max. Marks: 80**
**Section I - MCQS (20 Marks)**
Section II – Subjective (60 Marks)

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Section I

Note to the students: - All the Questions are compulsory and carry equal marks.

Q1.	The effectiveness of an SVM depends upon:
Option A:	Selection of Kernel
Option B:	Kernel Parameters
Option C:	Soft Margin Parameter C
Option D:	All of the above
Q2.	Choose the correct option regarding machine learning (ML) and artificial intelligence (AI)
Option A:	ML is a set of techniques that turns a dataset into a software
Option B:	AI is a software that can emulate the human mind
Option C:	ML is an alternate way of programming intelligent machines
Option D:	All of the above
Q3.	Which of the following is not supervised learning?
Option A:	Naive Bayesian
Option B:	PCA
Option C:	Linear Regression
Option D:	Decision Tree
Q4.	Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging?
Option A:	Decision Tree
Option B:	Regression
Option C:	Classification
Option D:	Random Forest
Q5.	Which of the following can improve the performance of an AI agent?
Option A:	Learning
Option B:	Perceiving
Option C:	Observing
Option D:	All of the above

	Which of the following can improve the performance of an AI agent?
Q6.	The network that involves backward links from output to the input and hidden layers is known as
Option A:	Recurrent neural network
Option B:	Self organizing maps
Option C:	Perceptrons
Option D:	Single layered perceptron
Q7.	A perceptron is
Option A:	Single layer feed-forward neural network with pre-processing.
Option B:	Double layer auto-associative neural network
Option C:	Auto-associative neural network
Option D:	Neural network that contains feedback
Q8.	Advantage of Decision Tree----------------
Option A:	Possible Scenarios can be added
Option B:	Use a white box model, if given result is provided by a model
Option C:	Worst, best and expected values can be determined for different scenarios
Option D:	All of the above
Q9.	Which of the following search algorithms requires less memory?
Option A:	Depth First Search
Option B:	Linear Search
Option C:	Optimal Search
Option D:	Breadth-First Search
Q10.	The problem of finding hidden structure in unlabeled data is called
Option A:	Unsupervised Learning
Option B:	Supervised Learning
Option C:	Reinforcement Learning
Option D:	Rote Learning

Q2	Solve any Two Questions out of Three 10 marks each
A	Explain K-Means clustering Algorithm with proper steps.
B	Describe Principal Component Analysis (PCA) with suitable example.
C	Explain any two types of agents with architecture.

Q3	Solve any Two Questions out of Three 10 marks each
A	Use A* algorithm to find the path and cost from start state(S) to goal state (G).
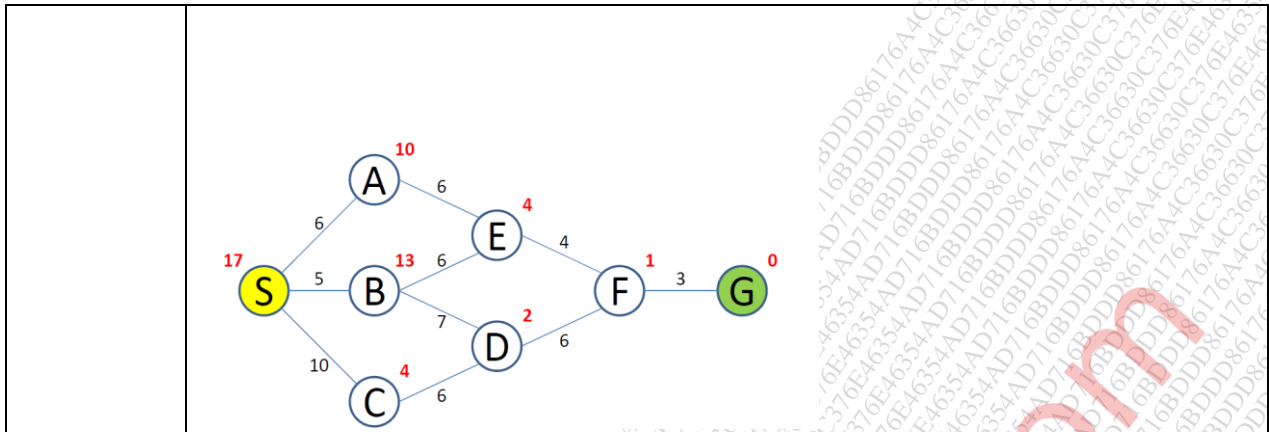
B	Explain Logistic Regression in detail with suitable examples.
C	Explain the basic ID3 algorithm of the decision tree and find out which attribute is the best classifier from the following dataset for the target attribute **buys computer.** table below

age	income	student	credit_rating	buys_computer
<=30	high	no	fair	no
<=30	high	no	excellent	no
30…40	high	no	fair	yes
>40	medium	no	fair	yes
>40	low	yes	fair	yes
>40	low	yes	excellent	no
31…40	low	yes	excellent	yes
<=30	medium	no	fair	no
<=30	low	yes	fair	yes
>40	medium	yes	fair	yes
<=30	medium	yes	excellent	yes
31…40	medium	no	excellent	yes
31…40	high	yes	fair	yes
>40	medium	no	excellent	no

Q4	Solve any Two Questions out of Three 10 marks each
A	Describe the support vector machine with advantages and disadvantages.
B	Describe Bayesian networks with suitable example.
C	Explain Random forest algorithm in detail with steps.