Hall Ticket Number:

Code No. : 14267 AS N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade
B.E. IV-Semester Advanced Suppl. Examinations, Aug./Sept.-2023
Machine Learning
(Common to CSE & AIML)

Time: **3 hours**

Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Write the various applications of Machine Learning.	2	1	1	1,2
2.	Define concept learning.	2	2	1	1,2
3.	Define & Compute Entropy for the following Dataset S Where Elevation, Roadtype, Speed limit are attribute and speed is the target.	2	3	2	1,2,3

Elevation	RoadType	Speed limit	Speed
Steep	Uneven	Yes	Slow
Steep	Smooth	Yes	Slow
Flat	Uneven	No	Fast
Steep	Smooth	No	Fast

Q. No.	Stem of the question	M	L	CO	PO
4.	Draw single layer artificial neural network architecture.	2	2	2	1,2
5.	Compute the conditional probability P(M/S) where Given P(S)=0.4, P(M)=0.3 and P(S/M)=0.9.	2	3	3	1,3
6.	Why Bayesian learning methods are important?	2	2	3	1,2
7.	What is the practical issue in applying k-Nearest neighbor algorithm?	2	1	4	1,2,4
8.	Construct the Case based Reasoning for Designing the water faucet.	2	3	4	1,2
9.	What are the factors that motivated the popularity of Genetic algorithms?	2	2	5	1,2,3
10.	Find the output dimension of Conv layer 1 if the input image is 514*514 and kernel size is 7*7 with zero padding and stride is 2.	2	3	5	1,2

Part-B (5×8 = 40 Marks)

Q. No.	Stem of the question	M	L	CO	PO
11. a)	Demonstrate find-S algorithm in detail considering the given dataset.	4	3	1	1,2,3

Time	Weather	Temperature	Company	Humidity	Wind	Goes
Morning	Sunny	Warm	Yes	Mild	Strong	Yes
Evening	Rainy	Cold	No	Mild	Normal	No
Morning	Sunny	Moderate	Yes	Normal	Normal	Yes
Evening	Sunny	Cold	Yes	High	Strong	Yes

b)	Write a short note on choosing the training experience in designing a learning system.	4	1	1	1,2	
12. a)	What is Artificial Neural Network? Explain hidden layer representations in back propagation.	4	2	2	1,2	
b)	Present the ID3 algorithm for learning decision trees and illustrates its operations in detail by using the below given Dataset Patient_record where which drug to suggest for patient P11.	4	3	2	1,2,3	

Patient Id	Age	Gender	BP	Cholesterol	Drug
P1	Young	Female	High	Normal	Drug A
P2	Young	Female	High	High	Drug A
P3	Middle Age	Female	High	Normal	Drug B
P4	Senior	Female	Normal	Normal	Drug B
P5	Senior	Male	Low	Normal	Drug B
P6	Senior	Male	Low	High	Drug A
P7	Middle Age	Male	Low	High	Drug B
P8	Young	Female	Normal	Normal	Drug A
P9	Young	Male	Low	Normal	Drug B
P10	Senior	Male	Normal	Normal	Drug B
P11	Middle Age	Female	Low	Normal	?

13. a) Describe Bayesian belief networks. Compute the following: 4   3   3   1,2,3

$P(D, \bar{S}, A, B, E)$
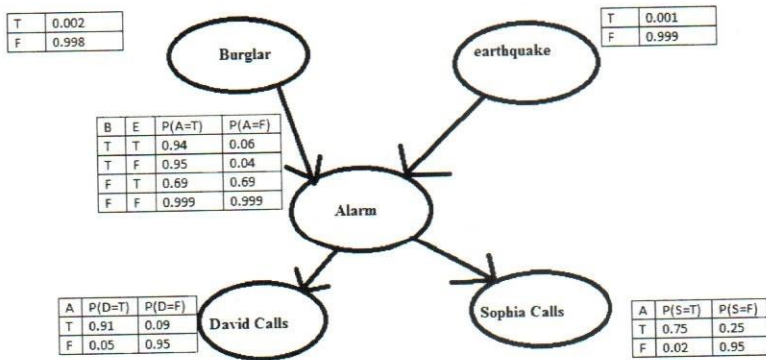
b)	Discuss Expectation Maximization Clustering Algorithm	4	1	3	1,2
14. a)	Illustrate k-Nearest neighbor algorithm for classification with an example.	4	3	4	1,2,3
b)	What is reinforcement learning? Explain in detail about Q Learning.	4	2	4	1,2
15. a)	Explain genetic operators in genetic algorithm (GA) and give example for Uniform operator.	4	2	5	1,2
b)	What is Convolutional Neural Network (CNN)? Construct all the layers of CNN with a neat diagram.	4	3	5	1,2