

Internal Assessment Test 1 – November 2021

Sub:	Artificial Intelligence & Machine Learning	Sub Code:	18CS71	Branch:	ISE
Date:	11/11/2021	Duration:	90 min's	Max Marks:	50
				Sem / Sec:	VII / A, B & C

Answer any FIVE FULL Questions

MARKS

- 1 Consider the given below training example which finds malignant tumors from MRI scans. [10]

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

Show the specific and general boundaries of the version space after applying candidate elimination algorithm. (Note: Malignant is +ve, Benign is —ve).

- 2 Consider the concept “Japanese Economy Car” with the following features {Origin,Manufacturer,Color,Decade,Type} [10]

Origin	Manufacturer	Color	Decade	Type	Target Value
Japan	Honda	Blue	1980	Economy	Y
Japan	Toyota	Green	1970	Sports	N
Japan	Toyota	Blue	1990	Economy	Y
USA	Chrysler	Red	1980	Economy	N
Japan	Honda	White	1980	Economy	Y
Japan	Toyota	Green	1980	Economy	Y
Japan	Honda	Red	1990	Economy	N

Compare the above example using Find-S and candidate elimination algorithms and list the observations.

- 3 Explain the steps in designing learning systems in detail. [10]

- 4 Create and explain the decision tree for the following transactions using ID3 algorithm. [10]

Tid	Refund	Marital Status	Taxable Income	Cheat
1	Yes	Single	125K	No
2	No	Married	100K	No
3	No	Single	70K	No
4	Yes	Married	120K	No
5	No	Divorced	95K	Yes
6	No	Married	60K	No
7	Yes	Divorced	220K	No
8	No	Single	85K	Yes
9	No	Married	75K	No
10	No	Single	90K	Yes

- 5 (a) Construct Decision trees to represent the Boolean Functions: [06]

a) $A \&\& \sim B$ b) $A \vee [B \&\& C]$ c) $[A\&\&B] \vee [C\&\&D]$

[P.T.O]

OBE	
CO	RBT
CO2	L3
CO2	L3
CO2	L1
CO2	L3
CO2	L3

(b) Discuss the two approaches to prevent over fitting the data. [04]

CO2	L1
-----	----

6 Create and explain the decision tree for the following transactions using ID3 algorithm. [10]

CO2	L3
-----	----

Day	A1	A2	A3	Classification
1	True	Hot	High	No
2	True	Hot	High	No
3	False	Hot	High	Yes
4	False	Cool	Normal	Yes
5	False	Cool	Normal	Yes
6	True	Cool	High	No
7	True	Hot	High	No
8	True	Hot	Normal	Yes
9	False	Cool	Normal	Yes
10	False	Cool	High	No

i) What is the entropy of this collection of training examples with respect to the target function classification?

ii) What is the information gain of a2 and a3 relative to these training examples?

Faculty Signature

CCI Signature

HOD Signature