## Code No.: 14267 N/O

## VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

## B.E. IV-Semester Main & Backlog Examinations, July-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  $(10 \times 2 = 20 \text{ Marks})$ 

Q. No.	Stem of the question		M	L	CO	PO
1.	Consider set of hypotheses H1 and H2, Find among them which more general than the other hypothesis.	is	2	1	1	1,2
	H1 = {"?", 'Normal", '?", '+"}					
	H2 = {'Warm', 'Normal','?', '+'}					
2.	Find the Hypothesis which best fits the given set of sample FIND-S algorithm.	es using	2	3	1	1,2,3
	DayOutlookTemperatureHumidityWindPlayTenD1SunnyHotHighWeakNoD2SunnyHotHighStrongNoD3OvercastHotHighWeakYesD4RainMildHighWeakYes	nis			•	
3.	Calculate the output y of a three-input neuron with bias. The featurevector is (x1, x2, x3) = (0.8,0.6,0.4) and weight value [w1,w2,w3, b]=[0.2, 0.1, -0.3, 0.35]. Use binary Sigmoid functions	nes are	2	3	2	1,2,3
	activation function.					
4.	activation function.  Consider the following set of training examples:		2	1	2	1,2
4.	activation function.		2	1	2	1,2
4.	Consider the following set of training examples:		2	1	2	1,2
	Consider the following set of training examples:    Instance   Classification   a_1   a_2		2	1	2	1,2
	Consider the following set of training examples:    Instance   Classification   a_1   a_2		2	3	2	1,2,4
	Consider the following set of training examples:    Instance   Classification   a_1   a_2			3		
	Consider the following set of training examples:    Instance   Classification   a_1   a_2			3		
	Consider the following set of training examples:    Instance   Classification   $a_1   a_2 $			3		
	Consider the following set of training examples:    Instance   Classification   $a_1   a_2 $			3		
	Consider the following set of training examples:    Instance   Classification   a_1   a_2			3		

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6.	Define Vapnik Chervo related with no of traini	oniks (VC) d	imension. H	low VC dimensio	n is 2	2	3	1,2
7.	Write the steps to fine	d a Maximur	n A Posteri	or (MAD) 11				1,2
0	using Brute-force method	od.	i i i ostelj	or (MAP) hypoth	esis 2	2	4	1,2
8.	73 100	1 1 2 1		T	2	3	4	1,2,4
	R 66  81		90 R	0				1,2,
		aright	;   81					
8								
	Initial state: s,		Next state:	$s_2$				
	Find the Q(s1,aright)?							
9.	Consider a string before	a crossover						
	s1 = 111 <u>1010</u> 101 s2 =	1110110101			2	3	5	1,2,3
	Compute the offspring's	after the cross	over					
0.	Find the output dimens 228*228 and kenel size i	ion of Conv s 5*5 with zer	layer 1 if ro padding a	the input image nd stride is 2.	is 2	3	5	1,2,4
	Pa	rt- $B$ (5×8 = 4	(0 Marks)					
. a)	Explain the issues that machine learning algorit	need to be	considered	while designing th	ne 4	1	1	1,2
b)	Consider the trining d	oto .						1,2
	classattribute. In he table low) or "H" (ter high), So Wind hasvalues "S' (for values "Yes" or "No".	1	Uule	Has values "1" (f.		3	1	1,2,3
	Humidity	Sunny	Wind	Play				
	L	N	2	No				
	H	N	W	Yes				
	H	Y	S	Yes				1
	H	Y Y	W	Yes				
	L		S	No				
	Wind is class label Play Wind , according to	Callulate V.	- 00	arith - 0	1			
12. a)	Explain the wkproroutput layer in a multila	oation learni	ng to upda	he reights of a	an 4	2	2	1,2
				ALCOHOL MANAGEMENT STATE OF THE				

CS		Major	Experience	Tie	Hired?					
CS										
CS										
CS							LI SHIP			
business   programming   pretty   YES										
Dusiness   programming   ugly   YES										
business management pretty NO business management pretty NO  Bayes net    The lecture started by 10.35   1. The lecture arrives late R. The lecture concerns robots M. The lecture started by 10.35   4 3 3 1    P(s)=0.3										
Discuss the significance of locally weighted regression.   Discuss the significance of locally we										
Bayes net    T. The lecture started by 10/35   The lecture started by 10/35   The lecture and started by 10/35   The lect										
Bayes net    T. The lecture started by 10:35   T. The lecture started by 10:35   The lecture concerns robots   The lecture concerns robots   The lecture concerns robots   The lecture concerns robots   The lecture is Manuella	a) III	lustrate Expecta	ation Maximizatio	on clustering a	lgorithm.		4	2	3	1,2
Bayes net    The lecture rarrives late   R: The lecture rarrives rarrives late   R: The lecture rarrives rate   R: The lecture rate rate rate rate rate rate rate ra						25			100	
P(s)=0.3  P(s)=0.05 P(L   M^S)=0.05 P(L   M^S)=0.1 P(L   -M^S)=0.1 P(L   -M^S)=0.2  T  P(T   L)=0.3 P(T   -L)=0.8  P(R   -M)=0.6  P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   -M)=0.6 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.5 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.6 P(R   M)=0.6 P(R   M)=0.3 P(R   M)=0.6	0)		Bayes n	L: The lect R: The lect M: The lect	turer arrives late cture concerns robo cturer is Manuela		4	3	3	1,2,3
P(L   M^S)=0.05 P(L   M^S)=0.1 P(L   -M^S)=0.1 P(L   -M^S)=0.1 P(L   -M^S)=0.2  Find the value of P (S ^ -M ^ L ~ R ^ T)?  Discuss the significance of locally weighted regression.  4 2 4  4 3 4 1    D						The second second			1	1
P(L   M^S)=0.05 P(L   M^S)=0.1 P(L   -M^S)=0.1 P(L   -M^S)=0.1 P(L   -M^S)=0.2  Find the value of P (S ^ -M ^ L ~R ^ T)?  Discuss the significance of locally weighted regression.  4 2 4  1 5 45 77 2 5.11 26 47 3 5.6 30 55 4 5.9 34 59 5 4.8 40 72 6 5.8 36 60 7 5.3 19 40 8 5.8 28 60 9 5.5 23 45 10 5.6 32 58 11 5.5 38 ?  Consider the Height and Age attributes of 10 persons given above. Find		P(s)=0.3	8)	JM J	(M)=0.0		-		,	
P(L   M^S)=0.05 P(L   M^S)=0.1 P(T   L)=0.3 P(T   L)=0.8				-	[D/D/A	0-00			1 14	Li
P(L   M^-S)=0.1   P(T   L)=0.3   P(T   L)=0.8   P(T   -L)=0.8   P(T   -L)=0.8						VI D. U. I			- T	*/
Find the value of P (S ^ ~M ^ L ~R ^ T)?  a)  Discuss the significance of locally weighted regression.  4 2 4  5 4 3 4 1    D			6 83		DIDI				41	
Find the value of P (S ^ ~M ^ L ~R ^ T)?  Discuss the significance of locally weighted regression.  4 2 4  4 3 4 1    ID			(L)		P(R			1,1	,	
Find the value of P (S ^ ~M ^ L ~R ^ T)?  Discuss the significance of locally weighted regression.    A 2 4	F	P(L M^-S)=0.1		L)=0.3					,	
Discuss the significance of locally weighted regression.	F	P(L M^~S)=0.1 P(L ~M^S)=0.1	P(T	L)=0.3 ~L)=0.8					,	
a) Discuss the significance of locally weighted regression.    ID   Height   Age   Weight	P	P(L M^~S)=0.1 P(L ~M^S)=0.1	P(T	L)=0.3 ~L)=0.8				1	,	
a) Discuss the significance of locally weighted regression.    10	F	P(L M^~S)=0.1 P(L ~M^S)=0.1	P(T	L)=0.3 ~L)=0.8				1/1		
a) Discuss the significance of locally weighted regression.    1	F	P(L M^~S)=0.1 P(L ~M^S)=0.1	P(T	L)=0.3 ~L)=0.8				10		
ID   Height   Age   Weight   1   5   45   77   2   5.11   26   47   3   5.6   30   55   4   4   5.9   34   59   5   4.8   40   72   6   5.8   36   60   7   5.3   19   40   8   5.8   28   60   9   5.5   23   45   10   5.6   32   58   11   5.5   38   ?   Consider the Height and Age attributes of 10 persons given above. Find	F	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^-S)=0.2	P(T P(T)	~L)=0.8				1		
ID   Height   Age   Weight   1   5   45   77   2   5.11   26   47   3   5.6   30   55   4   5.9   34   59   5   4.8   40   72   6   5.8   36   60   7   5.3   19   40   8   5.8   28   60   9   5.5   23   45   10   5.6   32   58   11   5.5   38   ?	F	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^-S)=0.2	P(T P(T)	~L)=0.8						
Name	Fi	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^-S)=0.2 and the value of	P(T) P(T) P(T) P(T)	~L)=0.8]	R		4	2	4	12
1       5       45       77         2       5.11       26       47         3       5.6       30       55         4       5.9       34       59         5       4.8       40       72         6       5.8       36       60         7       5.3       19       40         8       5.8       28       60         9       5.5       23       45         10       5.6       32       58         11       5.5       38       ?    Consider the Height and Age attributes of 10 persons given above. Find	Fi. a) Di	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^-S)=0.2 and the value of	P(T) P(T) P(T) P(T)	~L)=0.8]	R		4	2	4	1,2
2       5.11       26       47         3       5.6       30       55         4       5.9       34       59         5       4.8       40       72         6       5.8       36       60         7       5.3       19       40         8       5.8       28       60         9       5.5       23       45         10       5.6       32       58         11       5.5       38       ?    Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the signif	P(T) P(T) P(S^~M^L~I	C^T)? weighted regr	ression.		4 4	2 3	4 4	1,2 1,2,3
3 5.6 30 55 4 5.9 34 59 5 4.8 40 72 6 5.8 36 60 7 5.3 19 40 8 5.8 28 60 9 5.5 23 45 10 5.6 32 58 11 5.5 38 ?  Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L M^-S)=0.1 P(L ~M^S)=0.1 P(L ~M^S)=0.2  Ind the value of iscuss the signif	P(T) P(S^~M^L~F	~L)=0.8  R ^ T)?  weighted regr	ression.  Weight		4 4	2 3	4 4	
4       5.9       34       59         5       4.8       40       72         6       5.8       36       60         7       5.3       19       40         8       5.8       28       60         9       5.5       23       45         10       5.6       32       58         11       5.5       38       ?    Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L M^-S)=0.1 P(L ~M^S)=0.1 P(L ~M^S)=0.2  Ind the value of iscuss the significant signifi	P(T) P(S^~M^L~F) ficance of locally Height	C ^ T)?  weighted regr  Age  45	ression.  Weight 77	-M)=0.6	4 4	2 3	4 4	
5       4.8       40       72         6       5.8       36       60         7       5.3       19       40         8       5.8       28       60         9       5.5       23       45         10       5.6       32       58         11       5.5       38       ?    Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L M^-S)=0.1 P(L ~M^S)=0.1 P(L ~M^S)=0.2  Ind the value of iscuss the significant signifi	P(T) P(T) P(T) P(T) P(T) P(T) P(T) P(T)	~L)=0.8  R ^ T)?  weighted regr  Age  45  26	ression.  Weight 77 47	-M)=0.6	4 4	2 3	4 4	
6       5.8       36       60         7       5.3       19       40         8       5.8       28       60         9       5.5       23       45         10       5.6       32       58         11       5.5       38       ?    Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L M^-S)=0.1 P(L ~M^S)=0.1 P(L ~M^S)=0.2  Index the value of the significant	P(T) P(S^~M^L~F) ficance of locally Height 5 5.11 5.6	Age 45 26 30	Weight 77 47 55	-M)=0.6	4 4	2 3	4 4	
7       5.3       19       40         8       5.8       28       60         9       5.5       23       45         10       5.6       32       58         11       5.5       38       ?    Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant s	P(S^~M^L~Ficance of locally  Height 5 5.11 5.6 5.9	Age 45 26 30 34	Weight 77 47 55 59	-M)=0.6	4 4	2 3	4 4	
8       5.8       28       60         9       5.5       23       45         10       5.6       32       58         11       5.5       38       ?    Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant s	P(S^~M^L~F)  Ficance of locally  Height  5  5.11  5.6  5.9  4.8	Age 45 26 30 34 40	Weight 77 47 55 59 72	-M)=0.6	4 4	2 3	4 4	
9       5.5       23       45         10       5.6       32       58         11       5.5       38       ?    Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant s	P(S^~M^L~F)  P(S^~M^L~F)  Ficance of locally  Height  5  5.11  5.6  5.9  4.8  5.8	Age 45 26 30 34 40 36	ression.  Weight 77 47 55 59 72 60	-M)=0.6	4 4	2 3	4 4	
10 5.6 32 58 11 5.5 38 ?  Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant s	P(S^~M^L~I ficance of locally Height 5 5.11 5.6 5.9 4.8 5.8 5.3	Age 45 26 30 34 40 36 19	ression.  Weight 77 47 55 59 72 60 40	-M)=0.6	4 4	2 3	4 4	
Consider the Height and Age attributes of 10 persons given above. Find	Fi. a) Di	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant s	P(S^~M^L~I ficance of locally Height 5 5.11 5.6 5.9 4.8 5.8 5.3 5.8	Age 45 26 30 34 40 36 19 28	Weight 77 47 55 59 72 60 40 60	-M)=0.6	4 4	2 3	4 4	
Consider the Height and Age attributes of 10 persons given above. Find	Fi.	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant s	P(S^~M^L~F)  Figure 1  P(S \ M^L \ N \ N \ N \ N \ N \ N \ N \ N \ N \	Age 45 26 30 34 40 36 19 28 23	Weight 77 47 55 59 72 60 40 60 45	-M)=0.6	4 4	2 3	4 4	
The Weight of the Lith person by light Simple KNN with be-	Fi.	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant s	P(S^~M^L~F)  P(S^~M^L~F)  Ficance of locally  Height  5 5.11 5.6 5.9 4.8 5.8 5.8 5.3 5.8 5.5 5.6	Age 45 26 30 34 40 36 19 28 23 32	ression.  Weight 77 47 55 59 72 60 40 60 45 58	-M)=0.6	4 4	2 3	4 4	
the weight of the 11th person by using Simple KNN with k=5.	Fi. a) Di	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant of the value of iscuss the significant of the value of the value of iscuss the significant of the value of the value of iscuss the significant of the value of the	P(S^~M^L~Ficance of locally  Height  5 5.11 5.6 5.9 4.8 5.8 5.3 5.8 5.5 5.6 5.5 ght and Age attrib	Age  Age  45  26  30  34  40  36  19  28  23  32  38  utes of 10 pers	ression.  Weight 77 47 55 59 72 60 40 60 45 58 ? sons given ab	oove. Find	4 4	2 3	4 4	
a) What is Genetic Algorithm (GA). Explain GA with 8 queens' problem 4 3 5 1,	Fi. a) Di	P(L   M^-S)=0.1 P(L   ~M^S)=0.1 P(L   ~M^S)=0.2  Ind the value of iscuss the significant of the value of iscuss the significant of the value of the value of iscuss the significant of the value of the value of iscuss the significant of the value of the	P(S^~M^L~Ficance of locally  Height  5 5.11 5.6 5.9 4.8 5.8 5.3 5.8 5.5 5.6 5.5 ght and Age attrib	Age  Age  45  26  30  34  40  36  19  28  23  32  38  utes of 10 pers	ression.  Weight 77 47 55 59 72 60 40 60 45 58 ? sons given ab	oove. Find	4 4	2 3	4 4	

b)	What is Deep learning? Explain the Recurrent Neural Network (RNN) architecture and training steps involved while constructing RNN Model.	4	2	5	1,2
16. a)	What is an Inductive Bias? Explain the List then Eliminate Algorithm.	4	1	1	1,2
b)	What is Artificial Neural Network? Calculate the output where the threshold t=0.0 and take four combinations of inputs for x and y where bias=-1.	4	3	2	1,2,3
	1 0,				U
	0 1,				
	0 0,				
	1 1.				
	w = 0.3 $w = 0.5$ $w = 0.4$ $y$ $w = 0.4$				
17.	Answer any <i>two</i> of the following:  What is E -exhaustive? What are the true error and training error in version space? Give with an example.	4	1	3	1,2
b)	Explain the following Instance-based learning techniques.  i. Case-based Reasoning ii. Radial basis networks	4	2	4	1,2
c)	Consider the CNN Image below with filter values. Compute the output	4	3	5	1,2,3
	Input Image Fifter				
	3 8 8 4 8 4 1 0 -1 1 0 -1 1 0 -1 5 4 4 5 4				

M: Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i) :	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	30%
iii)	Blooms Taxonomy Level - 3 & 4	50%