

Faculty of Engineering

Sample Question Paper

BSc Engineering	Time Allowed: _____
Course: Artificial Intelligence	Instructor: _____
Note: Attempt all questions.	

Q. No.	Questions																																																																																																																																		
1	<p>Apply truth table/ Model Checking method to describe that following entailment statements are true or false?</p> <p>a) $(P) \models (P \vee Q)$ b) $(P) \models (P \wedge Q)$ c) $(P) \not\models (P \wedge Q)$ d) $\{P,Q\} \not\models (P \wedge Q)$ e) $(P \wedge Q) \not\models (P \vee Q)$</p>																																																																																																																																		
2	<p>A truth table constructed for the knowledge base of rational agent in Wumpus world problem. The KB is true ,if R1 through R5 [rules] are true, which occurs in just 3 rows. In all 3 rows, P1,2 is false, so there is no pit in [1,2]. On the other hand, We cannot infer that there is a pit in [2,2] or P[3,1],Explain why?</p> <table><tr><th>$B_{1,1}$</th><th>$B_{2,1}$</th><th>$P_{1,1}$</th><th>$P_{1,2}$</th><th>$P_{2,1}$</th><th>$P_{2,2}$</th><th>$P_{3,1}$</th><th>R_1</th><th>R_2</th><th>R_3</th><th>R_4</th><th>R_5</th><th>KB</th></tr><tr><td>false</td><td>false</td><td>false</td><td>false</td><td>false</td><td>false</td><td>false</td><td>true</td><td>true</td><td>true</td><td>true</td><td>false</td><td>false</td></tr><tr><td>false</td><td>false</td><td>false</td><td>false</td><td>false</td><td>false</td><td>true</td><td>true</td><td>true</td><td>false</td><td>true</td><td>false</td><td>false</td></tr><tr><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td></tr><tr><td>false</td><td>true</td><td>false</td><td>false</td><td>false</td><td>false</td><td>false</td><td>true</td><td>true</td><td>false</td><td>true</td><td>true</td><td>false</td></tr><tr><td>false</td><td>true</td><td>false</td><td>false</td><td>false</td><td>false</td><td>true</td><td>true</td><td>true</td><td>true</td><td>true</td><td>true</td><td><u>true</u></td></tr><tr><td>false</td><td>true</td><td>false</td><td>false</td><td>false</td><td>true</td><td>true</td><td>true</td><td>true</td><td>true</td><td>true</td><td>true</td><td><u>true</u></td></tr><tr><td>false</td><td>true</td><td>false</td><td>false</td><td>true</td><td>false</td><td>false</td><td>true</td><td>false</td><td>false</td><td>true</td><td>true</td><td>false</td></tr><tr><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td><td>\vdots</td></tr><tr><td>true</td><td>true</td><td>true</td><td>true</td><td>true</td><td>true</td><td>true</td><td>false</td><td>true</td><td>true</td><td>false</td><td>true</td><td>false</td></tr></table>	$B_{1,1}$	$B_{2,1}$	$P_{1,1}$	$P_{1,2}$	$P_{2,1}$	$P_{2,2}$	$P_{3,1}$	R_1	R_2	R_3	R_4	R_5	KB	false	false	false	false	false	false	false	true	true	true	true	false	false	false	false	false	false	false	false	true	true	true	false	true	false	false	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	false	true	false	false	false	false	false	true	true	false	true	true	false	false	true	false	false	false	false	true	true	true	true	true	true	<u>true</u>	false	true	false	false	false	true	true	true	true	true	true	true	<u>true</u>	false	true	false	false	true	false	false	true	false	false	true	true	false	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	true	true	true	true	true	true	true	false	true	true	false	true	false
$B_{1,1}$	$B_{2,1}$	$P_{1,1}$	$P_{1,2}$	$P_{2,1}$	$P_{2,2}$	$P_{3,1}$	R_1	R_2	R_3	R_4	R_5	KB																																																																																																																							
false	false	false	false	false	false	false	true	true	true	true	false	false																																																																																																																							
false	false	false	false	false	false	true	true	true	false	true	false	false																																																																																																																							
\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots																																																																																																																							
false	true	false	false	false	false	false	true	true	false	true	true	false																																																																																																																							
false	true	false	false	false	false	true	true	true	true	true	true	<u>true</u>																																																																																																																							
false	true	false	false	false	true	true	true	true	true	true	true	<u>true</u>																																																																																																																							
false	true	false	false	true	false	false	true	false	false	true	true	false																																																																																																																							
\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	\vdots																																																																																																																							
true	true	true	true	true	true	true	false	true	true	false	true	false																																																																																																																							
3	<p>Give decision trees to represent the following Boolean functions:</p> <p>(a) $A \wedge \neg B$ (b) $A \vee [B \wedge C]$ (c) $A \text{ XOR } B$</p>																																																																																																																																		

4

Induct a decision tree Model till root node for the following data set using Gini index and Entropy , Classification error algorithms.

Age	Gender	Specialty	Sportive
19	F	IT	Yes
21	F	IT	Yes
20	M	Medicine	No
35	M	Engineering	No
34	M	Medicine	Yes
28	M	Sociology	No
35	F	IT	Yes
40	F	Medicine	No
35	M	IT	Yes
23	M	IT	No
24	F	Engineering	No
23	F	Medicine	No
24	F	Sociology	Yes
