



# VIT

Vellore Institute of Technology  
(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.:

SLOT:D1+TD1

## SCHOOL OF COMPUTER SCIENCE AND ENGINEERING CONTINUOUS ASSESSMENT TEST - II FALL SEMESTER 2025-2026

**Programme Name & Branch** : B.Tech. & Computer Science & Engineering / SCOPE  
**Course Code and Course Name** : BCSE306L & Artificial Intelligence  
**Faculty Name(s)** : ALL  
**Class Number(s)** : ALL  
**Date of Examination** : 08-10-2025 (AN)  
**Exam Duration** : 90 minutes

**Maximum Marks: 50**

### General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes:  
CO4 - Apply basic principles of AI in solutions that require problem-solving, inference, perception, knowledge representation and learning.

Q. No	Question	M	CO	BL
1.	<p>Consider the min-max tree below, A to EE are numbers on the leaf, and the numbers for leaf are shown in the last row.</p> <div style="text-align: center;"> </div> <p>           i) Which move should be made at the top level (Left or Right)? What is its value? Show the steps of applying the Minimax algorithm by giving the specific value for each node.(4).            ii) Which nodes get pruned if you use alpha-beta pruning when you explore successors of states going left-to-right? (3).            iii) Which nodes get pruned if you use alpha-beta pruning when you explore successors of states going right-to-left? (3).         </p>	10	4	3
2.	<p>a) For the following sentences write the predicate and convert the sentence to first order logic</p> <p>i) "You can fool some of the people all of the time and all of the people some of the time, but not all of the people all of the time." (2)</p> <p>ii) "There's a lady who's sure all that glitters is gold, and she's buying a Stairway to Heaven." (2)</p> <p>b) Classify the following formulas as valid, satisfiable, or not satisfiable, and prove using the semantic method (truth tables, <math>\neg</math> Negation). (6)</p> <p>i) <math>(p \wedge q) \rightarrow (p \vee q)</math>, ii) <math>(p \wedge \neg q) \vee q</math>, iii) <math>(\neg q \rightarrow \neg p) \rightarrow (p \rightarrow q)</math>, iv) <math>\neg q \rightarrow q</math>            v) <math>(\neg q \rightarrow q) \wedge (q \rightarrow \neg q)</math></p>	10	4	3



## SCHOOL OF COMPUTER SCIENCE AND ENGINEERING CONTINUOUS ASSESSMENT TEST - II FALL SEMESTER 2025-2026

<p>3. Suppose you are given the following axioms:</p> <ol style="list-style-type: none"> <li>1. <math>0 \leq 3</math>.</li> <li>2. <math>7 \leq 9</math>.</li> <li>3. <math>\forall x \quad x \leq x</math>.</li> <li>4. <math>\forall x \quad x \leq x + 0</math>.</li> <li>5. <math>\forall x \quad x + 0 \leq x</math>.</li> <li>6. <math>\forall x, y \quad x + y \leq y + x</math>.</li> <li>7. <math>\forall w, x, y, z \quad w \leq y \wedge x \leq z \Rightarrow w + x \leq y + z</math>.</li> <li>8. <math>\forall x, y, z \quad x \leq y \wedge y \leq z \Rightarrow x \leq z</math>.</li> </ol> <p>i) Give a backward-chaining and forward chaining proof of the sentence <math>7 \leq 3+9</math>. (Use only the axioms given here, not anything else) Show only the steps that leads to success, not the irrelevant steps.</p>		10	4	3																																				
<p>4. Consider the following hypothetical data concerning student characteristics and whether or not each student should be hired.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>GPA</th> <th>Effort</th> <th>Hirable</th> </tr> </thead> <tbody> <tr><td>Sarah</td><td>poor</td><td>lots</td><td>No</td></tr> <tr><td>Dana</td><td>average</td><td>some</td><td>No</td></tr> <tr><td>Alex</td><td>average</td><td>some</td><td>No</td></tr> <tr><td>Annie</td><td>average</td><td>lots</td><td>Yes</td></tr> <tr><td>Emily</td><td>excellent</td><td>lots</td><td>Yes</td></tr> <tr><td>Pete</td><td>excellent</td><td>some</td><td>Yes</td></tr> <tr><td>John</td><td>excellent</td><td>lots</td><td>No</td></tr> <tr><td>Kathy</td><td>poor</td><td>some</td><td>No</td></tr> </tbody> </table> <p>Use a Naive Bayes classifier to determine whether or not someone with excellent attendance, poor GPA, and lots of effort should be hired.</p>	Name	GPA	Effort	Hirable	Sarah	poor	lots	No	Dana	average	some	No	Alex	average	some	No	Annie	average	lots	Yes	Emily	excellent	lots	Yes	Pete	excellent	some	Yes	John	excellent	lots	No	Kathy	poor	some	No		10	3	3
Name	GPA	Effort	Hirable																																					
Sarah	poor	lots	No																																					
Dana	average	some	No																																					
Alex	average	some	No																																					
Annie	average	lots	Yes																																					
Emily	excellent	lots	Yes																																					
Pete	excellent	some	Yes																																					
John	excellent	lots	No																																					
Kathy	poor	some	No																																					
<p>5. a) Consider the following Bayesian network. A, B, C, and D are Boolean random variables. If we know that A is true, what is the probability of D being true?</p> <div style="text-align: center;"> </div> <p>b) For the following Bayesian network</p> <div style="text-align: center;"> </div> <p>we know that X and Z are not guaranteed to be independent if the value of Y is unknown. This means that, depending on the probabilities, X and Z can be independent or dependent if the value of Y is unknown. Construct probabilities where X and Z are independent if the value of Y is unknown, and show that they are indeed independent.</p>		10	3	3																																				