Name:.....
Roll No:.....

MAR ATHANASIUS COLLEGE OF ENGINEERING (AUTONOMOUS),
KOTHAMANGALAM - 686666
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B.TECH SECOND SERIES EXAMINATION, OCTOBER 2026 (S5 CS, DS, AIML)
B24CS3T05 ARTIFICIAL INTELLIGENCE

Max. Marks: 40 Duration: 1.5 Hours

PART A

Answer all questions. Each question carries 3 marks.

1. **Formulate** the following problem as a CSP. Class scheduling: There is a fixed number of professors and classrooms, a list of classes to be offered, and a list of possible time slots for classes. Each professor has a set of classes that he or she can teach. (CO3)

2. **Prove**, or find a counter example to, the following assertion: (CO4)

$$\text{If } \alpha \models \gamma \text{ or } \beta \models \gamma \text{ (or both) then } (\alpha \wedge \beta) \models \gamma$$

3. **Classify** the following as supervised, unsupervised, or reinforcement learning:
   (a) spam detection
   (b) customer segmentation
   (c) a game-playing agent.

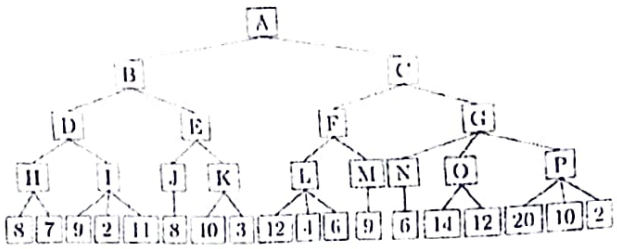
   Justify each. (CO5)

4. A hospital deploys an AI diagnostic tool trained mostly on data from one demographic group. **Identify** the ethical risks involved. (CO5)

PART B

Answer all questions. Each question carries 14 marks.

5. (a) **Apply** alpha-beta pruning to this tree (searching left to right, with A as a MAX node). Which nodes or subtrees get pruned, and what is the final value returned at the root?



(CO3) (7 marks)

(b) **Solve** the following crypt arithmetic problem and identify the digits corresponding to each letter in each of the given problem

(a)

```
  L O G I C
+ L O G I C
-----------
P R O L O G
```

(b)

```
    L E T S
+   W A V E
-----------
  L A T E R
```

(CO3) (7 marks)

6. (a) **Generate** First Order Predicate Logic for
   i. Every man respects his parent.
   ii. Not all students like both Mathematics and Science.
   iii. Only one student failed in Mathematics.

(CO4)(6 marks)

(b) Consider a 4x4 cave with a Wumpus, a treasure, a player.
   i. **Give** the diagrammatic representation of the cave environment.
   ii. **List** the PEAS description for Wumps World.
   iii. Also **explain** the task environment and characteristics of Wumpus World.
   iv. **Derive** the axiom on how the Wumpus world is designed.

(CO4)(8 marks)