Instructions:
- This question paper contains SIX questions, out of which any FIVE are to be attempted.
- Each question carries equal marks.
- Parts of question must be answered together.

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1. a) Classify the following problems into well-structured problem and ill-structured problem:
   i) Predicting how to dispose wet waste safely.
   ii) Calculating path of the trajectory when a missile is fired.
   b) Which searching techniques can be used to solve the following situations?
   i) A parent wants to put his child in a good school. There are many schools in the city, but the parent's preference is to the one that is nearby his house.
   ii) Is it possible to relate any of the searching techniques in a case when any Bluetooth enabled device is looking for the other Bluetooth-enabled devices?
   c) Develop a PEAS description for the face authentication system.   [2+2+6]

2. a) Write a short note on following:
   i) Turing Test
   ii) MYCIN
   b) Solve the following cryptarithmetic problem using constraint satisfaction:

$$
\begin{array}{r}
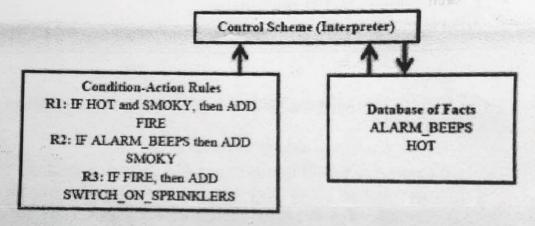SEND \\
+MORE \\
\hline
MONEY \\
\hline
\end{array}
$$

   c) Using minimax technique finds out the value for α and β of the following game tree, show each step or state that you have taken for the optimal decision:
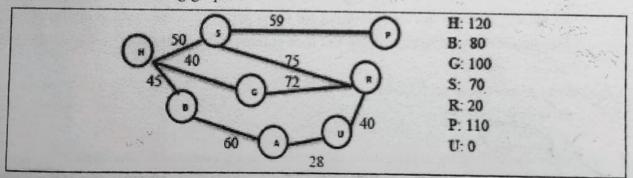   Initially $[\alpha, \beta] = [-\infty, +\infty]$

O 5 -3 3 3 -3 0 2 -23 5 2 5 -5 0 1 5 1 -30 -55 -33 2   [3+4+3]

3. Consider the following rule-based system architecture:

Control Scheme (Interpreter)

Condition-Action Rules		Database of Facts
R1: IF HOT and SMOKY, then ADD FIRE		ALARM_BEEPS
R2: IF ALARM_BEEPS then ADD SMOKY		HOT
R3: IF FIRE, then ADD SWITCH_ON_SPRINKLERS		

Given the facts in the working memory apply forward and backward chaining. [10]

4. Consider the following graph:

H: 120
B: 80
G: 100
S: 70
R: 20
P: 110
U: 0

Given that the initial state is H and goal state is U, Also you have given the admissible heuristic as a straight-line distance. Find a solution by using A* approach. Also give the time and space complexity of this technique. [10]

5. Consider the following case study on Automatic Car Parking System:

Parking has always been a very big issue today with the immense rise in the number of vehicles. Imagine you have to reach to your friend's party and the venue is on an overcrowded street; you would be definitely looking for a system that would assist you in parking the car, providing you with the details of the available parking and how long possibly you would have to walk down to the party place after your car is parked! Discuss the role of AI in solving this problem. It should taking consideration on the following points:

a) What will the system provide?

b) Which parameters are involved in the process?
c) System and the role of AI
d) What are the Inputs?
e) What will be the output?

[2X5=10]

6. Write the following knowledge using predicate statements:
   a) Mary, Micky and John are members of Rotary club.
   b) Every Rotary club member who is not a swimmer is a mountain climber.
   c) Mountain climbers do not like rains.
   d) Anyone who does not like water is not a swimmer.
   e) John doesn't like anyone who likes brussel sprouts.

[2X5=10]