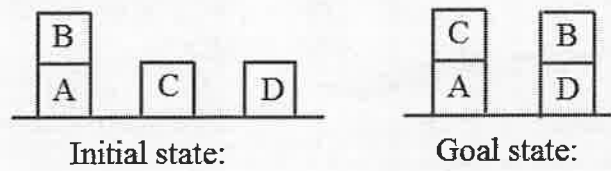


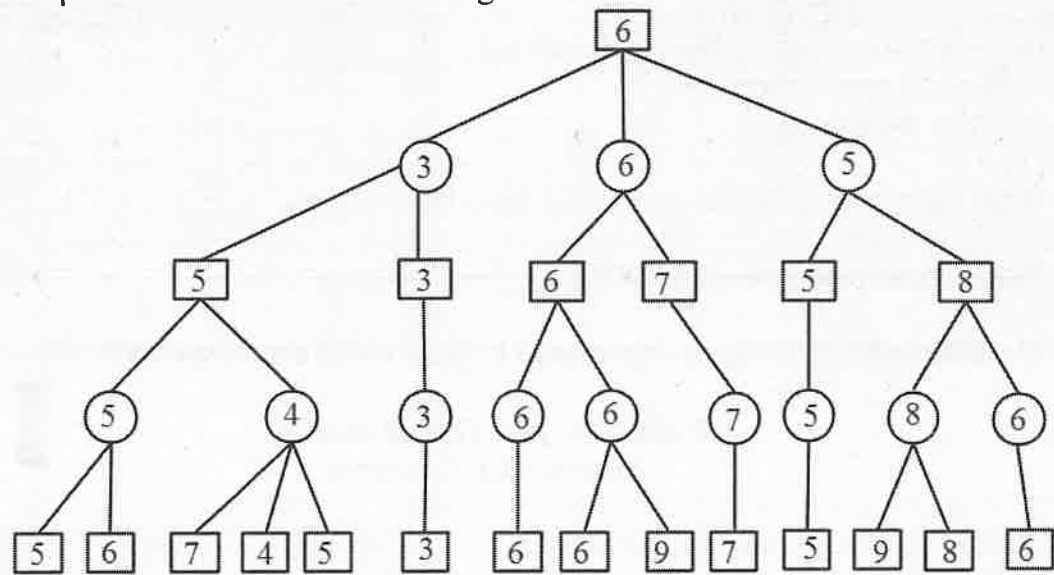
31. a. Explain goal stack planning and solve the following.



(OR)

b. Explain various levels of NLP.

32. a. Explain α - β cut off and solve the following.



(OR)

b. Draw the architecture of expert system. Explain all individual components.

Reg. No.

B.Tech. DEGREE EXAMINATION, NOVEMBER 2019
Third to Seventh Semester

15CS401 – ARTIFICIAL INTELLIGENCE

(For the candidates admitted during the academic year 2015 – 2016 to 2017 – 2018)

Note:

- (i) **Part - A** should be answered in OMR sheet within first 45 minutes and OMR sheet should be handed over to hall invigilator at the end of 45th minute.
- (ii) **Part - B** and **Part - C** should be answered in answer booklet.

Time: Three Hours

Max. Marks: 100

PART – A (20 × 1 = 20 Marks)
Answer ALL Questions

- Artificial intelligence is defined as
(A) Transferring your intelligence into computers
(B) Programming with your intelligence
(C) Making machine intelligent
(D) Putting more memory to computer
- What is the term used for describing the judgment or common sense part of problem solving?
(A) Heuristic
(B) Critical
(C) Value based
(D) Analytical
- AND-OR graph is related with
(A) Hill climbing
(B) Simulated annealing
(C) DFS
(D) Problem reduction
- The data structure for DFS is
(A) Stack
(B) Queue
(C) Priority queue
(D) Linked list
- Heuristic is used in
(A) Informed search
(B) Un-informed search
(C) Brute force
(D) Blind search
- The time complexity for breadth-first search is
(A) $O(b^d)$
(B) $O(bd)$
(C) $O(d)$
(D) $O(n)$
- In A^* algorithm if $g(n) = 0$ then it becomes
(A) Hill climbing
(B) AND-OR graph
(C) Linear search
(D) Heuristic search
- Consider a complete search tree of depth 15, every node at node 0 to 14 has 10 children and every node at depth 15 is a leaf node. In the complete tree
(A) There will be $O(15^{10})$ children
(B) There will be $O(10^{15})$
(C) There will be 15 children
(D) There will be 15×10 children

9. If P is a proposition the P takes the value
 (A) [0, 1] (B) {0, 1}
 (C) 0 (D) 1
10. If P, $P \rightarrow Q \vdash Q$ then the differencing procedure is known as
 (A) Modus tollens (B) Syllogism
 (C) Modus ponens (D) Tautology
11. If $NQ, P \rightarrow Q \vdash ?$
 (A) P (B) Q
 (C) NP (D) NQ
12. $A \vee V, NB \vdash A$ is known as
 (A) Unit resolution (B) Modus ponens
 (C) Modus tollens (D) FOL
13. Temporal logic is related with
 (A) Time (B) Space
 (C) Models (D) Planning
14. Strips is related with
 (A) Goal stack planning (B) Learning
 (C) Knowledge representation (D) Propositional logic
15. ATN is used to check
 (A) Parse a sentence in NLP (B) Check the syntax
 (C) Intermediate representation (D) Correctness of sentences
16. In NLP F measure is given as
 (A) $(3 * \text{precision} * \text{recall}) / (\text{precision} + \text{recall})$ (B) $(2 * \text{precision} * \text{recall}) / (\text{precision} + \text{recall})$
 (C) $(\text{Precision} + \text{recall}) / (\text{precision} - \text{recall})$ (D) $(\text{Precision} - \text{recall}) / (\text{precision} + \text{recall})$
17. Utility function denotes
 (A) Numeric value for a terminal state (B) Numeric value for a start state
 (C) It is a heuristic value (D) It denotes the value for intermediate state
18. In zero-sum game
 (A) No player wins (B) It is a draw
 (C) Game doesn't take place (D) If one player wins then other loses
19. α - β pruning is used for
 (A) Traverse the tree from left to right (B) Top down search
 (C) Reduce the search space (D) Bottom up search
20. The height $h(A)$ of a fuzzy set A is defined as $h(A) = \sup A(x)$ where x belongs to A. Then the fuzzy set A is called normal when
 (A) $h(A) = 0$ (B) $h(A) < 0$
 (C) $h(A) = 1$ (D) $h(A) < 1$

PART – B (5 × 4 = 20 Marks)

Answer ANY FIVE Questions

21. What is Turing test?
22. Define a state space search problem in AI with example.
23. Define Heuristic value for
 (i) Travelling salesman problem
 (ii) 8 puzzle problem
24. In propositional logic define the following
 (i) Completeness
 (ii) Soundness
25. Write the syntax of first order logic in Backus-Naur form.
26. State various predicates in STRIPS.
27. Illustrate how knowledge is represented in fuzzy based expert system?

PART – C (5 × 12 = 60 Marks)

Answer ALL Questions

28. a. Explain various problem characteristics.
 (OR)
 b. Explain water jug problem. Construct production rules for the problem where 2 jugs, one 4 g and another 3g with no measurement. Assume a pump is available from which any amount of water can be taken. Find 2g water in 3g jug.
29. a. Explain A^* algorithm with a suitable example.
 (OR)
 b. Explain the following
 (i) Depth limited search
 (ii) Best first search
30. a.i. Explain unification algorithm. (4 Marks)
 ii. The law says that “it is a crime for an American to sell weapons to hostile nations. The country “Nano”, an enemy of America has some missiles, and all of its missiles were sold by colonel west, who is an American”.
 Use resolution principle to prove that west is a criminal. (8 Marks)
 (OR)
 b. Explain the following
 (i) Semantic network
 (ii) Frame with suitable example.