32. a. Explain alpha-beta pruning procedure with an example.

**(OR)**

b. Discuss in detail about expert system with its architecture diagram.

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**B.Tech. DEGREE EXAMINATION, NOVEMBER 2018**
3rd to 7th 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

1. What is Artificial Intelligence?
   (A) Putting your intelligence into computer
   (B) Programming with your own intelligence
   (C) Making a machine intelligence
   (D) Playing a game

2. What is state space?
   (A) The whole problem
   (B) Your definition to a problem
   (C) Problem you design
   (D) Representing your problem with variable and parameter

3. A search algorithm takes _____ as an input and returns _____ as an output.
   (A) Input, output
   (B) Problem, solution
   (C) Solution, problem
   (D) Parameters, sequence of actions

4. A problem is a search space defined by one of these state.
   (A) Initial state
   (B) Last state
   (C) Intermediate state
   (D) Final state

5. Which search method takes less memory?
   (A) Depth-first search
   (B) Breadth-first search
   (C) Optimal search
   (D) Linear search

6. A problem solving approach works well for
   (A) 8-puzzle problem
   (B) 8-queen problem
   (C) Finding a optimal path from a given source to a destination
   (D) Robot navigation

7. Which function will select the lowest expansion node at first for evaluation?
   (A) Greedy best-first search
   (B) Best-first search
   (C) Depth-first search
   (D) Linear search

8. A production rule consists of _____.
   (A) A set of rules
   (B) A sequence of steps
   (C) Set of rules and sequence of steps
   (D) Arbitrary representation to problem

9. Which is not a property of representation of knowledge?
   (A) Representation verification (B) Representational adequacy
   (C) Inferential adequacy (D) Inferential efficiency

10. Which is used to construct the complex sentences?
   (A) Symbols (B) Connectives
   (C) Logical connectives (D) Symbols and connectives

11. How many proposition symbols are there in AI?
   (A) 1 (B) 2
   (C) 3 (D) 4

12. What will happen if two literals are identical?
   (A) Remains the same (B) Added as three
   (C) Reduced to one (D) One variable less

13. Which of the following search belongs to totally ordered plan search?
   (A) Forward state-space search (B) Hill-climbing search
   (C) Depth-first search (D) Breadth-first search

14. One of the main challenges of NLP is _____.
   (A) Handling ambiguity of sentences (B) Handling tokenization
   (C) Handling POS-Tagging (D) Linguistics

15. Machine translation
   (A) Converts one human language to another (B) Converts human language to machine language
   (C) Converts any human language to English (D) Converts machine language to human language

16. How many types of quantifiers are available in AI?
   (A) 6 (B) 2
   (C) 3 (D) 4

17. General games involves _____.
   (A) Single agent (B) Multi agent
   (C) Neither single-agent nor multi-agent (D) Only single-agent and multi-agent

18. The initial state and legal moves for each side define the _____ for the game.
   (A) Search tree (B) Game tree
   (C) State space search (D) Forest

19. _____ is/ are the well known expert systems for medical diagnosis systems.
   (A) MYCIN (B) CADUCEUS
   (C) DENDRAL (D) SMH·PAL

20. The main components of the expert systems are _____.
   (A) Inference engine (B) Knowledge base
   (C) Inference engine and knowledge base (D) Meta data



**PART – B (5 × 4 = 20 Marks)**
Answer **ANY FIVE** Questions

21. What is AI? Write the properties of AI.

22. State the requirements for good control strategy and explain it.

23. What is iterative deepening? Give example.

24. State the differences between BFS and DFS.

25. How is predicate logic helpful in knowledge representation and state the syntax of first order predicate logic?

26. Name the expert system tools used for research.

27. State the applications of expert systems.

**PART – C (5 × 12 = 60 Marks)**
Answer **ALL** Questions

28. a. What is problem characteristics? Explain briefly the various problem characteristics.

**(OR)**

b. Explain about defining the problem as a state space search by using water jug problem with (4,3) quantity jugs. Assume the initial state of the problem as (0,0) and goal state as (2,0).

29. a. What do you mean by searching? Explain $A^*$ algorithm in detail with an example.

**(OR)**

b. What are the problems encountered during hill climbing and what are the ways available to deal with these problems and write the hill climbing algorithm.

30. a. Explain various approaches to knowledge representation.

**(OR)**

b. Explain the knowledge representation using predicate and propositional logic with an unification algorithm.

31. a. Describe the components of planning in detail.

**(OR)**

b. Solve the following block world problem by goal-stack planning method.