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**M.Sc. (IT) (Second Semester)**  
**EXAMINATION, May-June, 2022**

**Paper Fifth**  
**AI AND EXPERT SYSTEM**  
**(205)**

*Time : Three Hours]**[Maximum Marks: 100**[Minimum Pass Marks:40***Note -Attempt all sections as directed**

**Section - A**  
**(Objective/Multiple Type Questions)**  
**(1 mark each)**

**Note- Attempt all questions.****Choose the correct answer and write it in your answer book.**

- Which of the following is a component of artificial intelligence?
  - Learning
  - Training
  - Designing
  - Puzzling

**P.T.O.**

- Which of the following is not a type of artificial intelligence agent?
  - Learning AI agent
  - Global - based AI agent
  - Simple reflex AI agent
  - Unity- based AI agent
- Which of the following is not commonly used. Programming language for artificial intelligence-
  - Perl
  - Java
  - Prolog
  - Lisp
- What is the main task of a problem-solving agent?
  - Solve the given problem and reach to goal.
  - To find out which sequence of action will get it to the goal state
  - Both (A) and (B)
  - None of the above
- When will hill-climbing algorithm terminate
  - Stopping criterion met
  - Global min/max is achieved
  - No neighbour has higher value
  - All of the mentioned

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6. Alpha-beta pruning is modified version of the

- (A) Minimax algorithm
- (B) Minimax algorithm
- (C) Maximin algorithm
- (D) Maximax algorithm

7. The----- is a way of combining the advantages of both depth-first and breadth-first search into a single method.

- (A) Iterative deepening depth first search
- (B) Bidirectional search
- (C) Best first search
- (D) Depth limited search

8. AND- OR graph is used in

- (A) AO\* algorithm
- (B) A\* algorithm
- (C) BFS
- (D) None of the above

9. Which is not familiar connectives in first order logic'

- (A) and
- (B) iff
- (C) or
- (D) not

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P.T.O.

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10. Inference algorithm is complete only if.....

- (A) It can derive any sentence
- (B) It can derive any sentence that is an entailed version
- (C) It is truth preserving
- (D) It can derive any sentence that is an entailed version & it is truth preserving

11. Which of the following elements constitutes the frame structure

- (A) Facts or data
- (B) Procedures and default values
- (C) Frame names
- (D) Frame reference in hierarchy

12. Which of the following is used in the backward chaining AI algorithm.

- (A) Conjuncts
- (B) Composition of substitution
- (C) Substitution
- (D) None of the above

13. A hybrid bayesian network contains

- (A) Both discrete and continuous variables
- (B) Only discrete variables
- (C) Only discontinuous variable
- (D) Both discrete and discontinuous variable.

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14. One of the main challenge's of NLP is
- (A) Handling tokenization
  - (B) Handling ambiguity of sentences
  - (C) Handling Pos-Tagging
  - (D) All of the above
15. Which of the following statement is correct.
- (A) All regular grammar are context free but not vice verse
  - (B) All context free grammar are regular grammar but not vice verse
  - (C) Regular grammar and context free grammar are the same entity
  - (D) None of the mentioned
16. Semantic grammars is-----
- (A) Encode semantic information into a syntactic grammar.
  - (B) Decode semantic information into a syntactic grammar.
  - (C) Encode syntactic information into a semantic grammar.
  - (D) Decode syntactic information into a semantic grammar.
17. Which of the following is the model used for learning
- (A) Decision tree
  - (B) Neural networks
  - (C) Propositional and FOL rules
  - (D) All of the mentioned

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P.T.O.

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18. Which of the following is incorrect application of expert system?
- (A) Design domain
  - (B) Monitoring system
  - (C) Systems domain
  - (D) Knowledge domain
19. Which of the following are components of expert system?
- (A) Knowledge base
  - (B) Inference engine
  - (C) User interface
  - (D) All of the above
20. How many types of rules are there in rule based system?
- (A) 2
  - (B) 3
  - (C) 4
  - (D) 5

### Section - B

#### (Very Short Answer Type Questions)

(2 marks each)

**Note: -Attempt All questions. Answer using 2-3 sentences.**

1. Define artificial intelligence. Give example of areas in which AI is used.
2. What is turing test?
3. Define breadth first search.
4. What is alpha-beta cutoffs?

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5. What are frames? How do they differ from semantic nets.
6. Compare forward and backward chain.
7. What is Bayesian Belief Network?
8. What is parsing techniques?
9. Write down name of any four expert systems.
10. Briefly explain the knowledge acquisition process.

### Section-C

#### (Short Answer Type Questions)

(3 marks each)

**Note- Attempt all questions. Answer precisely using 75 words.**

1. Explain AI problems.
2. What is production system? Write its characteristics.
3. Explain problem reduction technique by suitable example.
4. Define constraint satisfaction problem.
5. What is the significance of knowledge representation? Write the characteristics of knowledge representation.
6. Express the following sentence as conceptual dependency structure.
  - (i) Bill is programmer
  - (ii) Sam gave marry a box of candy
7. Describe the basic steps of natural language processing.
8. Write short notes on recursive transition networks.
9. Explain the learning by taking advise.
10. Explain the application of expert system.

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### Section-D

#### (Long Answer Type Questions)

(6 marks each)

**Note : Attempt any five questions. Answer precisely using 150 words.**

1. Explain the problem characteristics with appropriate example.
2. Describe A\* algorithm with suitable example.
3. What are scripts? Construct a script for a “fast food restaurant”.
4. Differentiate between monotonic and non-monotonic reasoning.
5. Explain MYCIN Expert System.
6. Explain Goal Stack Planning.
7. Explain First Order Predicate Logic.
8. Explain Mini-Max Search Procedure.