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4700115

EXPERT SYSTEM

CHAPTER 1

1. Which of the following is an element of an expert system?
   a. User mode b. **agenda** **c.** expert d. experience

2. What is an expert system?

An expert system is a program that attempts to mimic human expertise by applying inference methods to a specific body of knowledge.

3. State three differences between Expert systems and Conventional systems.

Expert system	Conventional system
Knowledge is fragmented, implicit and is difficult to communicate except in small "chunks".	Knowledge is complete and explicit
Rules are complex and conditional	Rules are simple with few conditions
Problem-solving demands dynamic, context-driven, rules ,relationship	Problem-solving demands are predictable and repetitive sequences of actions.

4. Who is an EXPERT?
   Expertise is task-specific knowledge acquired and developed from training, reading and experience.
5. In 1960, ---------- and ---------- wrote computer programs to test the hypothesis that intelligent behavior resulted from heuristic search.

Answer: Allan Newell, Herbert Simon

CHAPTER 2

I. An expert system can be used anywhere, any time.
   a. **True** b. False
II. Human experts are 100% reliable or consistent
   a. True b. **False**
III. Experts may not be good at explaining decisions
   a. **True** b. False
IV. Pick the odd one out. Problems with Expert Systems
   b. Limited domain
   c. Experts needed to setup and maintain system

d. No “common sense”
e. None of the above

V. DENDRAL: Used to identify the structure of chemical compounds.
a. **True** b. False

CHAPTER 3

1. Which of the following is/are not expert system development tools?

a. Symbolic Programming
b. ES Shells
c. Human expert
d. Conventional Programming

2. If an ES gives a wrong conclusion, it may be difficult to know whether this was caused by an error in the system or by an error in the information given to it.

a. **True** b. False

3. An ideal ES should include which of the following?

a. **Symbolic processing**.
b. Open to inspection
c. technical capabilities

4. Which of the following does not describe Expert system?

a. Easily modified,
b. Heuristic
c. **Symbolic processing**
d. Open to inspection

5. One of the disadvantages of ES is Expert systems are difficult and expensive to develop and maintain.

a. **True** b. False

CHAPTER 4

I. State the Three-phase process in Decision making process

Intelligence phase, Design phase and Choice phase

II. Explain the phases stated above in (Q16)
   a. **Intelligence phase**: collect the necessary information
   b. **Design phase**: method for considering data is designed
   c. **Choice phase**: select alternative

III. A representation of reality is called -------

Ans. **Model**

IV. ---------- is sequence of steps

Ans. **Algorithm**

V. ------- are categories of data considered in algorithm

Ans.

The expert system development lifecycle

CHAPTER 5

1. State the Phase 2: System analysis & design
    a. Produce conceptual design
    b. Decide development strategy
    c. Decide sources of knowledge, and ensure co-operation
    d. Select computer resources
    e. Perform a feasibility study
    f. Perform a cost-benefit analysis

2. State the phase 1: project initialization
a. Problem definition
b. Needs assessment
c. Evaluation of alternative solutions
d. Verification that an ES approach is appropriate
e. Consideration of management issues

3. State Phase 4: System development
    a. Build the knowledge base
    b. Test, evaluate and improve the knowledge base
    c. Plan for integration
4. State Phase 5: Implementation
    a. Ensure acceptance by users
    b. Install, demonstrate and deploy the system
    c. Arrange orientation and training for the users
    d. Ensure security
    e. Provide documentation
    f. Arrange for integration and field testing
5. State Phase 3: Prototyping
    a. Build a small prototype
    b. Test, improve and expand it
    c. Demonstrate and analyse feasibility
    d. Complete the design

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Chapter 1.

1. Which of the following is an area of artificial intelligence ……..

a. **Speech**

b. Buildings
c. Drink Production
d. World Domination

2. The expert's knowledge about solving specific problems is called the …... a. Expert Sense

b. Expert Nansa
c. **Knowledge Domain**
d. Knowledge Area

3. The problem domain is always a superset of the knowledge domain. a. **True**

b. False

4. DENDRAL was used in …... used

a. **in chemical mass spectroscopy to identify chemical constituents**
b. medical diagnosis of illness
c. geological data analysis for oil
d. geological data analysis for minerals

5. Rete's Algorithm does not have the drawback of high memory space requirements a. True

b. **False**

Chapter 2.

1. Logic is the study of making …...

a. Life decisions
b. **Inferences**
c. Wild guesses
d. Arguments

2. Semantics refers to the meanings we give to ….

a. names
b. events
c. **symbols**
d. logic

3. …… nets are shallow knowledge structures – all knowledge is contained in nodes and links. a. Knowledge

b. Schematic
c. **Semantic**

d. Inference

4. Schema is a(n) ……. complex knowledge structure than a semantic net. a. **more**

b. less

c. equally

d. none of the above

5. First Order Predicate Logic cannot express things that are sometime true a. **True**

b. False

Chapter 3.

1. A tree is a hierarchical data structure consisting of …..

a. data and links

b. leaves and fruits

c. stem and root

d. **nodes and branches**

2. Simple graphs can have loops.

a. True

b. **False**

3. …… reasoning where conclusions must follow from premises.

a. Induction

b. Reduction

c. **Deduction**

d. Subtraction

4. ….. reasoning back from a true condition to the premises that may have caused the condition a. Induction

b. Reduction

c. Deduction

d. **Abduction**

5. ….. group of statements where the last is justified on the basis of the previous ones. a. **Argument**

b. Logic

c. Reasoning

d. Deduction

Chapter 4.

1. Uncertainty is essentially lack of …… to formulate a …..

a. knowledge, hypothesis
b. **information, decision**
c. class, group
d. inference, logic

2. Classical probability is also known as ……. probability

a. **a priori**
b. post priori
c. pre priori
d. priori

3. …… reasoning deals with exact facts and exact conclusions

a. Reductive
b. Inductive
c. **Deductive**
d. Abductive

4. The following are theories to deal with uncertainty except:

a.Bayesian Probability

b. Hartley Theory
c. **Einstein's Theory**
d. Shannon Theory

5. Inductive arguments can never be proven correct (except in mathematical induction). a. **True**

b. False

Chapter 5.

1. The following are sources of uncertainty in rules except:

a. Uncertainty related to individual rules
b. Uncertainty due to conflict resolution
c. Uncertainty due to incompatibility of rules
d. **Uncertainty due to lack of confidence**

2. Fuzzy logic is a superset of conventional logic – extended to handle partial truth. a. **True**

CHAPTER 7

b. False

3. ….. fusion is another cause of uncertainty – fusing of ….. from different types of information. a. **Data**

b. Information
c. Knowledge
d. Logic

4. The Dempster-Shafer Theory is a method of …. reasoning

a. Unsure
b. Exact
c. **Inexact**
d. Sure

5. A discrimination function is not a way to represent which objects are members of a set. a. True

b. **False**

4701915

CS4

Emmanuel Kofi Kabo Amissah

Expert Systems

CHAPTER 1

1. An …… is a computer system that emulates, or acts in all respects, with the decision-making capabilities of a human expert.
    a) Expert System
    b) Information Systems
    c) Operating Systems
    d) Something else Systems

2. Knowledge base and inference engine are the main components of an expert system
    a) False
    b) True
    c) Both
    d) None
3. The expert's knowledge about solving specific problems is called the ….
    a) knowledge domain
    b) Information domain
    c) domain area
    d) data knowledge
4. These are advantages of Expert systems except?

a) Increased reliability
b) Increased availability
c) Performance
d) Slow response

5. Forward chaining is reasoning from facts to the conclusions resulting from those facts and is best for prognosis, monitoring, and control.
   a) False
   b) Maybe
   c) True
   d) None of the above

CHAPTER 2

1. Logic is the study of making ….
   a) Cakes
   b) Inferences
   c) Ideas
   d) Motions
2. An/a ….. refers to the formal way facts and rules of inferences are used to reach valid conclusions.
   a) Argument
   b) Point
   c) Reason
   d) None
3. Epistemology is the formal study of knowledge
   a) False
   b) True
   c) Both a and b
   d) None
4. These are categories of Epistemology except
a) Philosophy
b) Tacit
c) Apriori
d) This one
5. knowledge about knowledge and expertise is known as?
   a) Metreknowledge
   b) Matterknowledge

c) Metaknowledge
d) Meatknowlegde

CHAPTER 3

1. A tree is a hierarchical data structure consisting of..

a) Leaves and stems
b) Nodes and leaves
c) Branches and nodes
d) Stem and branches

2. A binary tree restricts the number of children per node to a maximum of ….
    a) 4
    b) 1
    c) 2
    d) 3
3. A graph can have zero or more links between nodes
    a) True
    b) False
    c) Both of the above
    d) None of the above
4. A state space shows the transitions an object can make in going from one state to another
    a) False
    b) True
    c) None
    d) All the above
5. The types of logic include the following except..
    a) Deduction
    b) Abduction
    c) Inception
    d) Intuition

CHAPTER 4

1. Uncertainty is essentially lack of information to formulate a decision.
    a) True
    b) False
    c) Maybe
    d) None
2. Errors related to measurements include the following except
    a) Errors of precision
    b) Errors of accuracy

c) Systematic errors
d) None of the above

3. When repeated trials give the exact same results, the system is ….
   a) Deterministic
   b) Nondeterministic
4. Bayes' Theorem is commonly used for decision tree analysis of business and social sciences.
   a) False
   b) True
   c) Maybe
   d) None
5. These are types of believes in expert systems except
   a) Possible
   b) Religious
   c) Certain
   d) Plausible

CHAPTER 5

1. Verification is concerned with the correctness of the system's building blocks
   a) True
   b) False
   c) Maybe
   d) None
2. Validation refers to minimizing the global uncertainties of the entire expert system
   a) True
   b) False
   c) Maybe
   d) None
3. The danger of ….. methods is the lack of complete theory to guide the application or warn of inappropriate situations
   a) Agile
   b) Ad hoc
   c) Research
   d) None
4. The certainty factor, CF, is a way of combining …. into a single number
   a) Belief and disbelief
   b) Probabilities and improbabilities
   c) Facts and truths
   d) None of the above
5. Translation rules specify how modified or composite propositions are generated from their elementary propositions.
   a) True

b) False
c) Maybe
d) None

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Course: Expert Systems

CHAPTER 1

1. Internally, an expert system consists of how many components?
   a. One
   b. Two
   c. Three
   d. Four
2. Shallow knowledge is based on ……
   a. Limits of ignorance
   b. Breaking of rules
   c. Empirical and heuristic knowledge
   d. Basic structures, functions and behaviors of objects.
3. Deep knowledge is based on ……
   a. Limits of ignorance
   b. Breaking of rules
   c. Empirical and heuristic knowledge
   d. Basic structures, functions and behaviors of objects
4. ……. are rules of thumb or empirical knowledge gained from experience that may aid in the solution but are not guaranteed to work.
   a. Rule induction
   b. Heuristics
   c. Knowledge domain
   d. Problem domain
5. …… is the study of how humans process information.
   a. Cognition
   b. Problem solving
   c. Productions
   d. Rules

CHAPTER 2

1. The links of a semantic net are used to express ……..
   a. Nodes

b. Edges
c. Objects
d. Relationships

2. Two commonly used links in semantic nets are ……
   a. LIKE-A and KIND-OF
   b. IS-A and LIKE-A
   c. A-KIND-OF and IS-A
   d. IS-A and KIND-OF
3. ……. is a compound statement that is always true whether its individual statements are true or false.
   a. Tautology
   b. Contradiction
   c. Implication
   d. Equivalence
4. ……. is a compound statement that is always false.
   a. Tautology
   b. Contradiction
   c. Implication
   d. Equivalence
5. …… refers to knowing that something is true or false.
   a. Priori knowledge
   b. Posteriori knowledge
   c. Declarative knowledge
   d. Tacit knowledge

CHAPTER 3

1. …… is a path through a graph that begins and ends on the same node.
   a. Acyclic graph
   b. Cycle
   c. Digraph
   d. Lattice
2. ……. is a collection of characteristics that can be used to define the status of an object.
   a. State
   b. Character
   c. Object
   d. Class
3. ……. is logical reasoning in which conclusions must follow from their premises.
   a. Intuition
   b. Abduction

c. Deduction
d. Analogy

4. …… is reasoning back from a true conclusion to the premises that may have caused the conclusion.
   a. Intuition
   b. Abduction
   c. Deduction
   d. Analogy
5. …… is a group of multiple inferences that connects a problem with its solution.
   a. Rules
   b. Semantic nets
   c. Chain
   d. Linear resolution

CHAPTER 4

1. Which isn't a theory to deal with uncertainty?
   a. Markov Models
   b. Forward Chaining
   c. Bayesian Probability
   d. Hartley Theory
2. Which of these isn't an error related to measurement?
   a. Errors of accuracy
   b. Errors of precision
   c. Type 1 error(False Positive)
   d. Random fluctuations
3. …….. deals with events that are not reproducible and have no historical basis on which to extrapolate.
   a. Subjective probability
   b. Experimental probability
   c. Compound probability
   d. Conditional probability
4. …….. is the probability of an event A occurring, given that event B has already occurred.
   a. Subjective probability
   b. Experimental probability
   c. Compound probability
   d. Conditional probability
5. Which of these is not a characteristic of Markov Chains?
   a. It is the inverse of Conditional probability
   b. The process has a finite number of possible states
   c. The process can be in one and only one state at any one time
   d. The process moves or steps successively from one state to another over time

CHAPTER 14

CHAPTER 5

1. Which of these is not a major uncertainty in a rule-based expert system?
    a. Uncertainty related to individual rules
    b. Uncertainty due to conflict resolution
    c. Uncertainty due to incompatibility of rules
    d. Uncertainty due to procedural logic
2. ……. refers to minimizing the local uncertainties.
    a. Verification
    b. Validation
    c. Specification
    d. Implementation
3. …… refers to minimizing the global uncertainties of the entire expert system.
    a. Verification
    b. Validation
    c. Specification
    d. Implementation
4. Which of these is not an application of fuzzy logic?
    a. Operations Research
    b. Economics
    c. Gaming
    d. Literature
5. Certainty factors are simple to implement where inference chains are …….
    a. Tall
    b. Short
    c. Broken
    d. Missing

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CHAPTER 1

1. Weak AI is based on:
    a. Generic Algorithms
    b. Natural Neural Networks
    c. Artificial Neural Networks
    d. Inference Engine
2. A system that has the ability to emulate decision making ability of an expert is a. Expert
    b. Artificial Intelligence
    c. Inference Engine
    d. Expert System
3. An expert's knowledge about solving a specific problem is his / her

a. Domain
b. Problem Domain
c. Knowledge Base
d. Knowledge Domain

4. A Knowledge Domain is a subset of a problem domain
   a. True
   b. False

5. …… is an expert system used in chemical mass spectroscopy to identify chemical constituents?
   a. PROSPECTOR
   b. DENDRAL
   c. MYCIN
   d. DIPMETER

1. Using experience to solve problem is termed
   a. Induction
   b. Heuristics
   c. Deduction
   d. Story Board
2. Epistemology is the formal study of ……..
   a. Wisdom
   b. Data
   c. Knowledge
   d. Ideas
3. A knowledge that cannot be expressed by language is called
   a. Declarative
   b. Tacit
   c. Procedural
   d. Logical

4. The process of drawing valid conclusion is referred to as
   a. Reasoning
   b. Referencing
   c. Logical Reasoning
   d. Deterministic reasoning
5. A posteriori knowledge is _____
   a. That which proceeds
   b. That which follows
   c. That which precedes
   d. That which exceeds

1. Trees consists of _____
   a. Nodes only
   b. Nodes and branches
   c. Branches only
   d. None of the above
2. A …… is a diagram describing the finite number of states of a machine?
   a. ANS
   b. DNS
   c. FSM
   d. FGM
3. Graphs which have no cycles are
   a. Disconnected
   b. Digraph
   c. Acyclic

d. Lattice

4. What type of tree has only a single pathway from the root to its one leaf? a. Lean tree
   b. Degenerate tree
   c. Atomic tree
   d. Binary tree
5. A path through the graph beginning and ending with the same node is called …… a. Simple graph
   b. Circuit
   c. Multi graph
   d. Digraph

1. _____ is the lack of information to formulate a decision is known as
   a. Confusion
   b. Certainty
   c. Indecisive
   d. Uncertainty
2. Possible is a part of belief
   a. True
   b. False
3. Which of the following are not part of the common errors ……?
   a. Incomplete error
   b. Unambiguous error
   c. Simple error
   d. Error of Precision
4. Which of the following errors relate to hypothesis?

a. Errors of Precision
b. System Errors
c. Errors of Imprecision
d. False Positive

5. Which of the following type of belief rules out possibility?
   a. Probable
   b. Impossible
   c. Certain
   d. Plausible

CHAPTER 19

CHAPTER 5

1. A Fuzzy truth is called a Fuzzy qualifier
   a. False
   b. True
2. Minimizing local uncertainties is
   a. Verification
   b. Validation
   c. Reduction Error
   d. Error
3. _____ is a certainty factor can be used to rank in order of importance.
   a. Truth
   b. Belief
   c. Evidence
   d. Hypothesis
4. The Dempster-Shafer Theory is a method of uncertainty in expert systems a. False
   b. True
5. Minimizing the global uncertainties is
   a. Verification
   b. Validation
   c. Reduction Error
   d. Error

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Chapter 1

1. Computer program that solves problems that require human expert is termed as
   a. Artificial Intelligence
   b. Neural Networks
   c. Knowledge Base
   d. Expert System
2. Expert system acts in some respect like an expert
   a. False
   b. True
3. The specific area where the knowledge of an expert is applicable is termed as
   a. Knowledge Domain
   b. Problem Domain
   c. Expert Domain
   d. Solution Domain
4. Which of the following is a limitation of expert systems

   a. **Causal Knowledge**
   b. Knowledge Representation
   c. Knowledge Engineering
   d. Deep Knowledge
5. In expert system, the short term memory is also referred to as
   a. **Working Memory**
   b. Rules Memory
   c. Inference Memory
   d. Empirical Memory

Chapter 2

6. One of these is odd. Which one is it?
   a. Meta-Knowledge
   b. Philosophic Theory
   c. Posteriori Knowledge
   d. Priori Knowledge
7. Statements which cannot be classified as true or false is termed as
   a. Paradoxes
   b. Tautology
   c. Proposition
   d. Syllogism
8. Propositions which cannot be subdivided are known as
   a. Atoms
   b. Premises
   c. Axioms
   d. Objects
9. Knowledge which cannot not be expressed by natural language is referred to as
   a. Tacit Knowledge
   b. Priori Knowledge
   c. Conscious Knowledge
   d. Philosophic Knowledge
10. Anything which of interest can be said to be
   a. Information
   b. Wisdom
   c. Epistemology
   d. Data

Chapter 3

11. A hierarchical data structure of nodes and branches is known
   a. Peer-to-peer topology
   b. Graph

c. Array
d. Linked List

12. Reasoning where conclusions must follow from premises is
    a. Deduction
    b. Induction
    c. Intuition
    d. Abduction
13. Reasoning from the specific case to the general is
    a. Induction
    b. Intuitions
    c. Induction
    d. Forward Reasoning
14. Inferring conclusion based on similarities with other situation is
    a. Analogy
    b. Intuition
    c. Syllogism
    d. Autoepistemic
15. …….. determine the validity of argument
    a. Deductive logic
    b. Syllogism
    c. Modus Ponens
    d. Abductive Logic

Chapter 4

16. …… is when the expert system lacks the essential information to formulate decision
    a. Uncertainty
    b. System Biased
    c. Inference Delay
17. One of these is odd. Which one is it?
    a. Epistomoloy Theory
    b. Shannon Theory
    c. Dempster-Shafer Theory
    d. Markov's Model
18. The inverse of conditional probability is
    a. **Baye's Theorem**
    b. Hartley Theorem
    c. Markov Models
    d. Zadeh's Fuzzy Theorem
19. …… errors result from bias
    a. **Systematic Errors**
    b. Random Fluctuations
    c. Uncertainty
    d. Precision Error

20. Probability which deals with events that are not reproducible is
    a. **Subjective**
    b. Experimental
    c. Compound
    d. Conditional

Chapter 5

21. Minimizing the global uncertainties of the entire system is
    a. **Validation**
    b. Verification
    c. Error Reduction
    d. Error Prevention
22. Minimizing local uncertainties is
    a. **Verification**
    b. Validation
    c. Error Reduction
    d. Error Prevention
23. The Dempster-Shafer theory is a method of
    a. Inexact Reasoning
    b. Abductive Reasoning
    c. Exact Reasoning
    d. Deductive Reasoning
24. Generating modified or composite proposition from their elementary propositions can be done with
    a. **Translation Rules**
    b. Modification Rules
    c. Composite Rules
    d. Fuzzy Logic
25. Combining belief and disbelief into a single number is termed
    a. Certainty Factor
    b. Uncertainty Factor
    c. Certainty
    d. Uncertainty

EXPERT SYSTEMS ASSIGNMENT

4704515

CHAPTER 1 : INTRODUCTION TO EXPERT SYSTEMS

1. …… is the mechanism by which user and system communicate.
a. Memory
b. User interface
c. Disk space
d. Computer

ANS User interface

2. Another name for knowledge base is …….
a. Main memory
b. Knowledge acquisition
c. Production memory
d. Distribution memory

ANS c. Production memory

3. The method of inference that starts with hypothesis and look for rules that allow the hypothesis to be proven true is called …….
a. Rule based chaining
b. Forward chaining
c. Reverse chaining
d. Backward chaining

ANS d. Backward chaining

4. Which of the following is an advantage of using an expert system development tool?
a. Imposed structure
b. Knowledge engineering assistance
c. Rapid prototyping
d. All he above

5. Expert Systems contain the facts and procedures representing the rule of thumb decision making processes of an expert. That collection is kept in a ..... that is separate from a control program
a. Database
b. Knowledge base
c. Workspace
d. Scratchpad

ANS: b knowledge base

CHAPTER 2

1 ……..are the end-product of inferences when done according to formal rules.

a. Facts

b. Hypothesis

c. Conclusions

d. Priori

ANS c Conclusion

2. Uncertainty is the lack of _____ to formulate a _____

a. Facts, choice

b. Information, decision

c. .Data, decision

d. Information, choice

ANS b. Information, decision

3. Expert systems are designed for knowledge representation based on rules of logic called……

a. Semantics
b. Logic
c. Reasoning
d. Inference

ANS Inference

4. logic is ……..

a. Process of reasoning
b. Study of making inference
c. Process of thinking
d. Process of making good decisions

ANS b Study of making inference

5. Expert systems are designed for knowledge representation based on rules of logic called……

a. Semantics

b. Logic

c. inference
d. reasoning
ANS c. inference

CHAPTER 3

1. 1. A tree is a hierarchical structure consisting of …… and ……..

i. Nodes
ii. Branches
iii. Lines
iv. Links

a. I and III
b. II and III
c. III and IV
d. I and II

ANS d I and II

2. Which node is referred to as the root node and occupies the highest hierarchy?
   a. Bottom node
   b. Top node
   c. End node
   d. Last node

   ANS Top node

3. The nodes at the bottom of a tree are referred to as
   a. Top node
   b. End node
   c. Last node
   d. Leaves

   ANS d leaves
4. Graphs are sometimes called a ……... or net
   a. Directed trees
   b. Multiple trees

c. Network
d. Links
ANS c.networks

5. A ……. Is a path through the graph beginning and ending at the same node.
   a. Links
   b. Circle
   c. Circuit
   d. Loop
   ANS c circuit

CHAPTER 4

1. Uncertainty may result in one of the following
   a. Making poor or bad decision
   b. Making information available
   c. Making information unreliable
   d. Making information irrelevant

   ANS Making poor or bad decision

2. Deductive reasoning deals with
   a. Premises supporting the conclusion
   b. Exact facts and exact conclusions
   c. A and B
   d. None of the above

   ANS b Exact facts and exact conclusions

3 When repeated trials in a system give the exact same results, the system is termed as
   a. Unrealistic
   b. Nondeterministic
   c. Deterministic
   d. Ambiguous

ANS c determinisic

4 …… probability defines the probability of an event, as the limit of a frequency distribution.

a. Subjective
b. Experimental
c. Classic
d. Theoretical

ANS Experimental

5 …….. probability deals with events that are not reproducible and have no historical basis on which to extrapolate.

a. Subjective
b. Experimental
c. Classic
d. Theoretical

ANS Subjective

CHAPTER 5

1. There are several possible ways in which knowledge can be expressed, but the dominant form in use in contemporary expert systems is what is called ……

A) Rules
B) Production
C) Antecedent
D) Consequent

ANS Antecedent

2. Computing not based on classical two–valued logics which includes fuzzy logic, neural networks and probabilistic reasoning is known as
   a. Approximate Logic

b. Soft Computing
c. Hard computing
d. Extended computing

ANS Soft Computing

3. Which principle defines how to extend the domain of a given crisp set function to include fuzzy sets?
   a. Approximate principle
   b. Extended principle
   c. Fuzzy set principle
   d. Crisp set principle

   ANS Extended principle

4. Translation rules specify how modified or composite proposition are generated from their elementary propositions. The correct order for category of rules are

   I. Modification rules
   II. Quantification rules
   III. Composition rules
   IV. Qualification rules

   a. I, III, II and IV
   b. I, II, III and IV
   c. IV, I, II, and III
   d. II, III, I, IV

   ANS I, III, II and IV

5. Conditional, conjunctive, disjunctive fall under which category of translation rules.
   a. Modification rules
   b. Quantification rules
   c. Composition rules
   d. Qualification rules

   ANS Composition rules

EXPERT SYSTEM QUESTIONS

CRIPPS BOATENG IKEDA

4705415

CHAPTER 1

1. ……Is used in medical diagnosis of illness.
    a. PROSPECTOR
    b. MYCIN
    c. DIPMETER
    d. DENDRAL

2. …… is always a superset of the ……
    a. Knowledge Domain, Problem Domain
    b. Problem Domain, Research Domain
    c. Problem Domain, Knowledge Domain
    d. Solution Domain, Research Domain

3. ……is used in chemical mass spectroscopy to identify chemical constituents.
    a. PROSPECTOR
    b. MYCIN
    c. DIPMETER
    d. DENDRAL

4. …… is used in geological data analysis for oil.
    a. PROSPECTOR
    b. MYCIN
    c. DIPMETER
    d. DENDRAL

5. ……. is a prioritized list of rules created by the inference engine, whose patterns are satisfied by facts or objects in working memory?
    a. Agenda
    b. Algorithm
    c. Knowledge Acquisition Facility
    d. Propaganda

CHAPTER 2

1. …… refers to the meanings we give to symbols
    a. Logic
    b. Argument
    c. **Semantics**
    d. Inference

2. Expert systems are designed for knowledge representation based on rules of logic called ……
    a. Logic
    b. Semantics
    c. **Inferences**
    d. Arguments

3. An …… refers to the formal way facts and rules of inferences are used to reach valid conclusions.
    a. **Argument**
    b. Rules
    c. Epistemology
    d. Tacit

4. Which of the following is not a category of epistemology?
    a. Philosophy
    b. Tacit

c. A priori

d. **Uncertainty**

5. In expert systems, an …… is the metaknowledge that describes everything known about the problem domain.

a. Semantic net

b. ANS

c. **Ontology**

d. Conceptual graph

CHAPTER 3

1. "Heuristic" is a Greek word which means "to……..."

a. Guess

b. **Deduce**

c. Discover

d. Propound

2. Every node except the root has exactly …….. parents

a. Two

b. **One**

c. Three

d. Six

3. ……. has only a single pathway from root to its one leaf.

a. Nodes

b. **Degenerate trees**

c. Descending branches

d. Binary trees

4. Graphs are sometimes called ……

    a. Semantic

    b. **Net**

    c. Lines

    d. Links

5. Well formed problems have all the following except …….

    a. Bounded problem space

    b. **Opened-structured environment**

    c. Deterministic

    d. Discrete state

CHAPTER 4

1. How is Fuzzy Logic different from conventional control methods?

a) IF and THEN Approach
b) FOR Approach
c) WHILE Approach
d) DO Approach

Answer: a

Explanation: FL incorporates a simple, rule-based IF X AND Y THEN Z approach to a solving control problem rather than attempting to model a system mathematically.

2. The primitives in probabilistic reasoning are random variables. a) True

b) False

Answer: a

Explanation: The primitives in probabilistic reasoning are random variables. Just like primitives in Propositional Logic are propositions. A random variable is not in fact a variable, but a function from a sample space S to another space, often the real numbers.

CHAPTER 33

3. Which is true for Decision theory?

a) Decision Theory = Probability theory + utility theory
b) Decision Theory = Inference theory + utility theory
c) Decision Theory = Uncertainty + utility theory
d) Decision Theory = Probability theory + preference

Answer: c

Explanation: The Wumpus world is a grid of squares surrounded by walls, where each square can contain agents and objects. The agent (you) always starts in the lower left corner, a square that will be labeled [1, 1]. The agent's task is to find the gold, return to [1, 1] and climb out of the cave. So uncertainty is there as the agent gives partial and local information only. Global variable are not goal specific problem solving.

4. A constructive approach in which no commitment is made unless it is necessary to do so, is a) Least commitment approach

b) Most commitment approach
c) Nonlinear planning
d) Opportunistic planning View Answer

Answer: a

Explanation: Because we are not sure about the outcome.

5. How many terms are required for building a bayes model? a) 1

b) 2
c) 3
d) 4

Answer: c

Explanation: The three required terms are a conditional probability and two unconditional probability.

CHAPTER 5

1. Two of the following are not sources of uncertainty that expert systems operate in

i. Conflict resolution ii. Knowledge base iii. Individual views

iv. Incompatibility of rules

a. i and ii
b. ii and iii
c. iii and iv
d. i and iii

Answer **b**

2. The certainty factor, CF, is way of combining _____ and _____ into a single number.

a. Belief and truth
b. Disbelief and falsehood
c. Belief and disbelief
d. Truth and falsehood

Answer **c**

3. The certainty factor can be used to rank _____ in order of importance.

a. Truth
b. Belief
c. Evidence
d. Hypothesis

Answer **d**

4. In MYCIN, suppose another rule also concludes the same hypothesis, but with a different certainty factor, the certainty factor of rules concluding the same hypothesis are calculated from the _____.

a. Certainty function
b. Reduction function
c. Combining function
d. Attenuation function

Answer **c**

5. A theory that attempts to model uncertainty by a range of probabilities rather a single probabilistic number is
   a. Dempster---Shafer
   b. Propagation of Probabilities
   c. Approximate Reasoning
   d. Inference Nets

   Answer **a**

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EXPERT SYSTEMS

CHAPTER ONE

1. The knowledge of an expert system may be represented in a number of ways – it can be encapsulated in rules and …….....
   a. regulations b. **objects** c. laws

2. The first step in solving any problem is defining the problem area or …… to be solved.
   a. **section** b. division c. **domain**

3. The area of expert systems is a very successful approximate solution to the classic AI problem of programming……..
   a. **intelligence** b. knowledge c. data

4. An expert system is a computer system that …….. the decision-making ability of a human expert.
   a. defines b. produces c. **emulates**

5. The expert's …….. about solving specific problems is called the knowledge domain of the expert.

a. information b. data c. **knowledge**

CHAPTER TWO

6. A set of logical connectives is …… If every truth function can be represented using only the connectives from the adequate set.

a. **adequate** b. singleton c. safe

7. Semantic nets are sometimes referred to as …….. nets because nodes are related to other nodes.

a. sister b. **associative** c. kind-of

8. Two types of commonly used links are IS-A and …… , which are sometimes written as ISA and AKO.

a. **A-KIND-OF** b. AN-ARRAY-OF c. A-KEY-OF

9. The objects in a class have one or more attributes in common and each attribute has a ……..

a. property b. **value** c. key

10. The abbreviated form of object-attribute-value triple is ……

a. **OAV** b. O-A-V c. OAVT

CHAPTER THREE

11. A graph with directed links is referred to as …….

a. degenerate b. **digraph** c. acyclic

12. A tree is a hierarchical data structure consisting of……, which store information or knowledge, and ……., which connect the …….

a. branches, node, branch b. **nodes, branches, node** c. ISs, AK, IS

13. A directed acyclic graph a …….

a. **lattice** b. digraph c. structure

14. We use the term ……. to refer to both tress and lattices.

a. **graph** b. structure c. self-loop

15. The state space is the set of states showing the …… between states that the object can experience.

a. relations b. **transitions** c. links

CHAPTER FOUR

16. ……. reasoning deals with exact facts and exact conclusions that follow from those facts.

a. **Exact** b. Expert c. AI

17. The type of error is …… where some information is missing.

a. Ambiguous b. **incomplete** c. human error

18. ……. is an assumption to be tested.

a. Unreliability b. Erratic c. **Hypothesis**

19. ……. error is one that is not random but instead is introduced because of some bias.

a. Normal b. **Systematic** c. Flow

20. Statistics is concerned with collecting and analyzing data about ……

a. expert b. AI c. **populations**

CHAPTER 38

CHAPTER FIVE

21. The …… of an OPS5 rule depends on the number of patterns and the internal complexity of each pattern.

a. **specificity** b. state c. structure

22. Whenever a fact is entered in the working memory, it receives a unique …… indicating when it was entered.

a. recency of facts b. **timetag** c. means-ends

23. The …… , symbolized by the letter m, is analogous to the amount of mass.

a. fact measure b. **evidence measure** c. data measure

24. A fundamental difference between Dempster-Shafer theory and probability theory is the treatment of ……..

a. intelligence b. **ignorance** c. probability

25. The …… is a mathematical function that is often used in fuzzy sets as a membership function.

a. Z-function b. R-function c. **S-function**

EGYIR KINGSLEY ALBERT

4706315

NB: ANSWERS TO QUESTIONS ARE TYPED IN **BOLD**

CHAPTER 1

1. Expert systems _____
a. Increases costs
b. Increases danger
c. Reduces reliability
d. Increases availability

2. The expert's knowledge about solving specific problems is called the _____
a. Problem domain
b. Knowledge field
c. Knowledge domain
d. Specific knowledge

CHAPTER 39

3. Expert system languages are post-third generation.
a. False
b. True
c. None of the above
d. All of the above

4. Elements of an expert system includes the following except _____
a. Working memory
b. Inference engine
c. Skill set
d. Agenda

5. MACIE means _____
a. Matrix Algorithm Control Interface Engine
b. Matrix Continued Interface Engine
c. Matrix Controlled Interface Engine
d. Matrix Controlled Inference Engine

CHAPTER 2

1. The process of reaching valid conclusion is referred to as
a. Logical reasoning
b. Inference referencing
c. Decision making
d. Deterministic reasoning
2. Epistemology is concerned with all the following except _____
a. Structure
b. Nature
c. Origins of knowledge
d. Basic reasoning

3. A priori knowledge is _____
a. That which proceeds
b. That which exceeds
c. That which precedes
d. That which follows

4. A posteriori knowledge is _____
a. That which proceeds
b. That which exceeds
c. That which precedes
d. That which follows

CHAPTER 40

5. Unconscious knowledge is _____

a. Tacit knowledge

b. Declarative knowledge

c. Procedural knowledge

d. A priori

CHAPTER 3

1. Trees consists of _____

a. Nodes only

b. Branches only

c. Nodes and branches

d. None of the above

2. A _____ can be used to define an object's _____

a. State space , behavior

b. State machine, size

c. State space, size

d. State machine, behavior

3. AND-OR trees use _____

a. Backward chaining

b. Forward chaining

c. None of the above

d. All of the above

4. _____ has two premises and one conclusion

a. Argument

b. Deductive logic

c. Syllogism

d. Deductive argument

5. Intuition has no proven theory

a. True

b. False

CHAPTER 4

CHAPTER 41

1. Lack of information to formulate a decision _____
a. Certainty
b. Uncertainty
c. Probability
d. None of the above

2. The following are theories to deal with uncertainty except _____
a. Hartley Theory
b. Markov Models
c. Shannon Theory
d. Cassie Formulation

Use this to answer questions 3 to 5:

In dealing with errors relating to measurement,

3. How well the truth is known accounted for by _____
a. Errors of precision
b. Unreliability
c. Errors of accuracy
d. Systematic errors

4. Whether something is true or not accounted for by _____
a. Errors of precision
b. Unreliability
c. Errors of accuracy
d. Systematic errors

5. Result from bias accounted for by _____
a. Errors of precision
b. Unreliability
c. Errors of accuracy
d. Systematic errors

CHAPTER 5

1. There are several sources of uncertainty to rules including
a. Uncertainty related to individual rules
b. Uncertainty due to conflict resolution
c. Uncertainty due to incompatibility of rules

d. All the above

2. Minimizing the local uncertainties is known as _____
a. Verification
b. Validation
c. All of the above
d. None of the above

3. Minimizing the global uncertainties is known as_____
a. Verification
b. Validation
c. All of the above
d. None of the above

4. The theory of uncertainty based on fuzzy logic and concerned with quantifying and reasoning using natural language when words have ambiguous knowledge is known as _____
a. Approximate reasoning
b. Dempster-Shafer
c. Fuzzy Sets and Natural Language
d. Shannon Theory

5. The extension principle defines how to extend the domain of a given crisp function to include fuzzy sets
a. True
b. False
c. Not certain
d. None of the above

4706715
ABIGAIL GBADAGO AFI
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EXPERT SYSTEMS MULTIPLE CHOICE QUESTIONS

JOHNSON PHILEMON MAWUNYA

4707615

Chapter 1

1. The Following are branches of Artificial Intelligence except:
   a) Robotics
   b) Mathematics
   c) Machine Learning
   d) Expert Systems

2. The problem domain is a subset of the knowledge domain
   a) True
   b) False

3. The Knowledge based paradigm started in the
   a) 1940s
   b) 1950s
   c) 1990s
   d) 1970s

4. Post in Post Production Systems means that inference logic is added after the system is produced.
   a) True
   b) False

5. Following the Markov Algorithm AB -> HIJ, the output of GABKAB will be:
   a) GHIJKAB
   b) GHIJHIJKAB
   c) GABKHIJ
   d) GHIJKHIJ

Chapter 2

1. There are seven days in a week is a priori known
   a) True
   b) False

2. The Following are types of knowledge except:
   a) Tacit Knowledge
   b) Declarative Knowledge
   c) Imperative Knowledge
   d) Procedural Knowledge

3. Knowledge about knowledge is termed:
   a) metaknowledge
   b) noise
   c) knowledge knowledge

d) data

4. Pick the odd one out:
   a) Contingency
   b) Tautology
   c) contradiction
   d) assertion

5. The oldest and simplest type of formal logic is the
   a) predicate
   b) symbolic logic
   c) syllogism
   d) conclusion

Chapter 3

1. A directed acyclic graph is called a
   a) Lettuce
   b) digraph
   c) degenerate tree
   d) Lattice

2. Semantic nets are made using
   a) graphs
   b) trees
   c) leaves
   d) nodes

3. A finite state machine diagram shows all possible states of a system:
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   b) False

4. The Following are methods of inference except:
   a) State space
   b) AND-OR trees
   c) Decision trees
   d) Binary search trees

5. Modus ponens is the law of
   a) Detachment
   b) Contraposition
   c) Converse
   d) Logical assertion

Chapter 4

1. Classical probability is also known as
   a) a priori probability
   b) a posteriori probability
   c) Bayesian probability
   d) uncertainty

2. Deduction occurs from the:
   a) general to specific
   b) specific to general
   c) first to last
   d) last to first

3. experimental probability is also known as
   a) a priori probability
   b) a posteriori probability
   c) Bayesian probability
   d) uncertainty

4. DENDRAL is an example of an inference net
   a) True
   b) False

5. The Following are **not** terms used with evidence except:
   a) improbable
   b) uncertain
   c) certain
   d) surely

Chapter 5

1. Fuzzy logic is the base of Fuzzy Logic Expert Systems
   a) True
   b) False

2. The Dempster-Shafer theory was postulated in:
   a) 1996
   b) 2016
   c) 1957
   d) 1976

3. The certainty factor is a way of combining belief and disbelief into a single number
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4. Fuzzy logic is a subset of conventional logic
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    c) Fuzzy truth
    d) Fuzzy priori

Name; Kusi Kwaku Junior

Index; 4708515

Expert systems assignemnt

Chapter 1

1)_____ refers to reasoning from facts to the conclusions resulting from those facts – best for prognosis, monitoring, and control

A. Backward chaining
B. Foward chaining
C. Hypothesis
D. Observation

2)_____ refers to reasoning in reverse from a hypothesis, a potential conclus ion to be proved to the facts that support the hypothesis – best for diagnosis problems.

A. hypothesis
B. Observation
C. Foward chaining
D. Backwards chaining

3) In the _____, a new development in programming paradigms appeared called artifici al neural systems (ANS).

A. 1970's
B. 1980's
C. 1990's
D. 2000's

4)MACIE uses _____ to make inferences and backward chaining to query user fo r additional data to reach conclusions.

A. Observation
B. Research
C. Foward chaining
D. Backward chaining

5)Procedural programs are also called sequential programs.

A. True

B. False

Chapter 2

1)_____is the study of making inferences – given a set of facts, we attempt to reach a true conclusion.

A. Reasoning
B. Logic
C. Dynamic approach
D. Critical thinking

2)_____refers to the meanings we give to symbols.

A. Logic
B. Semantics
C. Anti-semantics
D. Notation

3)An _____refers to the formal way facts and rules of inferences are used to reach valid conclusions.

A. Argument
B. Inference
C. Semantics
D. Logic

4)Epistemology is the formal study of knowledge .

A. True
B. False

5)Metaknowledge is knowledge about knowledge and expertise.

A. True

B. False

Chapter 3

1) A _____ is a diagram describing the finite number of states of a machine.

A. SSF
B. FSM
C. FMS
D. MFS

2)_____uses backward chaining to divide problems into smaller problems and t hen solves them.

A. COBOL
B. FORTRAN
C. PROLOG
D. PYTHON

3)Reasoning back from a true condition to the premises that may have caused the condi tion refers to_____

A. Induction
B. Abduction
C. Deduction
D. Analogy

4)Inferring conclusions based on similarities with other situations refers to

A. Induction
B. Analogy
C. Abduction
D. Deduction

5)A graph can have zero or more links between nodes – there is no distinction between parent and child.

A. True
B. False

Chapter 4

1) _____reasoning is not as strong as deductive – premises support the conclusio n but do not guarantee it.

A. logical
B. Inductive
C. Abductive
D. Hypothetical

2)A _____does not necessarily mean random – could just be more than on e way to meet one of the goals given the same input.

A. Deterministic

B. Non Deterministic
C. Axioms
D. Subjective Probability

3)Experimental probability defines the probability of an event, as the limit of a frequency distribution

A. True
B. False

4)Subjective probability deals with events that are not reproducible and have no historic al basis on which to extrapolate.

A. True
B. False

5)_____ is essentially lack of information to formulate a decision.

A. Certainty
B. Uncertainty
C. Risk
D. Chance

Chapter 5

1) Validation refers to minimizing the local uncertainties.

A. True
B. False

2)Verification refers to minimizing the global uncertainties of the entire expert system.

A. True
B. False

3)The_____is useful in medicine / geology because we are determining the pro bability of a specific event (disease / location of mineral deposit), given certain symptom s / analyses.

A. Bayesian method
B. Baysian method
C. Baisyian method
D. Bayisian method

4)_____minimizes the activation of rules that only weakly suggest the hypothesi s.

A. Threshold values
B. Dempster shafer
C. Natural language
D. Fuzzy sets

5) In fuzzy sets, an object may partially belong to a set measured by the membership fu nction – grade of membership.

A. True

B. False

Questions for expert system

INDEX NUMBER:4708915

1. A system that emulates, or acts in all respects, with the decision making capabilities of human expert is known as

a)Perfect System

B)Imperfect System

c) Expert System

D) Artificial System

2. The main components of expert system are the knowledge base and Inference engine.

a)True

b)False

3.The knowledge domain is always a superset of the problem domain.

a)True

b)False

4)The following are all elements of an expert system except

a)user interface

b)Exploration facility

c)working area

d)Inference engine

5. The method of reasoning from a hypothesis, a potential conclusion to be proved to the facts that supports the hypothesis is known as

a)Best fit method

b)forward chaining

c)backward chaining

d)markov algorithm

CHAPTER 64

Chapter 2

_____is the study of making inference-given a set of facts, we attempt to reach a true conclusion.

a)Backward Reasoning

b)Forward Reasoning

c)Logic

d)Epistemology

2. In a priori knowledge, these are the following characteristics except;

a)Derived from senses

b)Universally true

c)"that which precedes"

d)cannot be denied without contradiction

3.Which of the following are knowledge-representation tecniques?

a)Conceptual Graphs

b)Frames

c)Logic

d)Rules

e)all of the aove

4.The following are features of propositional logic except;

a)Tautology

b)Paradoxes

c)Markov Algorithm

d)Open Statements

e)None of the above

5. Contradiction is to true statements as tautology is false statements.

A)True

b) False

Chapter 3

1.The following are characteristics of backward chaining except;

a)Present to past

b)Present to future

c)Goal-driven

d)Diagnosis

2.Which of following are method to convert the first-order predicate to causal form?

a)Standardize variables

b)Convert wff to prenex form

c)Eliminate conditionals

d)Rename variables in clauses making unique

e)All of the above

3. An argument may not be provable using propositional logic, but may be provable using predicate logic.

A)True

b) False

4._____ is to reasoning where conclusions must follow premises, as _____ is to inference

Is from the specific case to general.

a)Induction, Intuition

b)Heuristics, Deduction

c)Deduction, Induction

d) Abduction, Default

5. Which of the following are the rules of inference?

A) Modus Tollens

B) De Morgan's Law

c) Law of Double negation

d) Law of Conjunction

e) All of the above.

Chapter 4

1.The following are types of belief except;

a)Possible

b)Valid

c)Certain

d)Plausible

2.How many reasons are available for the popularity of ILP?

a)One

b)Two

c)Three

d)Four

3. _____ is how well the truth is known.

a)Errors of precision

b)Errors of accuracy

c)Random flatuations

d)Unreliability

4.Which is an appropriate language for describing the relationships?

a) First-order logic
b) Propositional logic
c) ILP
d) None of the mentioned

5. Which cannot be represented by a set of attributes?

a) Program
b) Three-dimensional configuration of a protein molecule
c) Agents
d) None of the mentioned

CHAPTER 5

1. What need to be satisfied in inductive logic programming?
   a) Constraint
   b) Entailment constraint
   c) Both Constraint & Entailment constraint
   d) None of the mentioned
2. How many literals are available in top-down inductive learning methods?
   a) 1
   b) 2
   c) 3
   d) 4
3. Which inverts a complete resolution strategy?
   a) Inverse resolution
   b) Resolution
   c) Trilogy
   d) None of the mentioned
4. Which method can't be used for expressing relational knowledge?
   a) Literal system
   b) Variable-based system
   c) Attribute-based system
   d) None of the mentioned
5. Which approach is used for refining a very general rule through ILP?
   a) Top-down approach
   b) Bottom-up approach
   c) Both Top-down & Bottom-up approach
   d) None of the mentioned

Questions for expert system

INDEX NUMBER:4708915

1. A system that emulates, or acts in all respects, with the decision making capabilities of human expert is known as

a)Perfect System

B)Imperfect System

c) Expert System

D) Artificial System

2. The main components of expert system are the knowledge base and Inference engine.

a)True

b)False

3.The knowledge domain is always a superset of the problem domain.

a)True

b)False

4)The following are all elements of an expert system except

a)user interface

b)Exploration facility

c)working area

d)Inference engine

5. The method of reasoning from a hypothesis, a potential conclusion to be proved to the facts that supports the hypothesis is known as

a)Best fit method

b)forward chaining

c)backward chaining

d)markov algorithm

Chapter 2

_____is the study of making inference-given a set of facts, we attempt to reach a true conclusion.

a)Backward Reasoning

b)Forward Reasoning

c)Logic

d)Epistemology

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c)”that which precedes”

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CHAPTER 71

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b) 2

c) 3

d) 4

8. Which inverts a complete resolution strategy?

a) Inverse resolution

b) Resolution

CHAPTER 72

c) Trilogy
d) None of the mentioned

9. Which method can't be used for expressing relational knowledge?
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   c) Attribute-based system
   d) None of the mentioned
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   a) Top-down approach
   b) Bottom-up approach
   c) Both Top-down & Bottom-up approach
   d) None of the mentioned

EXPERT SYSTEMS

CHAPTER 1

1. ……. is the experts knowledge about solving a specific problem
   a. Problem domain
   b. Expert domain
   c. Knowledge domain
   d. Specific domain
2. …… Is a branch of …….. and solves problem on the level of ……..
   a. Systems, artificial Intelligence, people
   b. Expert system, agricultural intelligence, machine
   c. Expert system, artificial intelligence, computer experts
   d. Expert system, artificial intelligence, human experts
3. Expert systems contain ……. Components internally
   a. Three
   b. Two
   c. Four
   d. Five
4. The primary difference between expert system language and procedural language focuses on …….
   a. Presentation
   b. Line of code
   c. Algorithm
   d. Representation
5. …… is a modular collection of knowledge.
   a. Chunk
   b. Shunk
   c. Wisdom
   d. Algorithm

CHAPTER 73

Chapter 2

1. The rules of logic is …….
   a. Interference
   b. Inference
   c. Logic rule
   d. Or, and , xor, not
2. The types of knowledge are ……..
   a. Prior and posterior
   b. Prior and poster
   c. Priori and posteriori
   d. Preiro and pasterior
3. Using experience to solve a problem is known as ……
   a. Heuristics
   b. Hueris
   c. Experience
   d. Old age
4. …….. is the study of knowledge
   a. Knowledgology
   b. Epistemology
   c. Episitsmology
   d. Metaknowledge
5. ……. Is the graphical representation of a sentence decomposed into all the terminals and non terminals used to derive a sentence
   a. Passe tree
   b. Parse tree
   c. Device tree
   d. Binary tree

CHAPTER 74

CHAPTER 3.

1. Tree consist of
   a. Stem, leaves and root
   b. Branches and nodes
   c. Branches and dots
   d. Flowers and nodes
2. …….. has no difference between parent and child
   a. Nodes
   b. Trees
   c. Graph
   d. Theory
3. A directed acyclic graph
   a. Lattice
   b. Isomorphism
   c. Cycle
   d. Tree
4. …… are useful for representing and reasoning about knowledge
   a. Directed trees
   b. Decision trees
   c. Graph
   d. Metaknowledge
      a. – has two premises and one conclusion
   a. Deductive logic
   b. Deductive argument
   c. Syllogism
   d. Arguments

CHAPTER 75

CHAPTER 4

1. …….is essentially lack of information to formulate a decision
   - **A. Uncertainity**
   - B. Lackless
   - C. Low information
   - D. Metainfo
2. Which of the following are not part of the common errors……
   - **a. Simple error**
   - b. Ambiguous error
   - c. Incorrect error
   - d. Incomplete error
3. ……..deals with events that are not reproducible and have no historical basis on which to extrapolate.
   - a. Experimental probability
   - b. Conditional probability
   - **c. Subjective probability**
   - d. Compound Probability
4. – depicts the probabilities that the system is in any certain state
   - **a.** Transition matrix
   - **b. State matrix**
   - c. Time of equilibrium
   - d. Markov matrix
5. If the antecedent is a logical combination of evidence, then …….. and ……..can be used to combine evidence.
   - a. Negative logic, fuzzy rules
   - b. Fuzzy logic , positive rules
   - c. Positive logic, negative rules
   - **d. Fuzzy logic, negation rule**

CHAPTER 76

CHAPTER 5

1. ……. refers to minimizing the global uncertainties of the entire expert system
   a. Verification
   b. Voting
   c. Validation
   d. Ad hoc method
2. ……. theory assumes that there is a fixed set of mutually exclusive and exhaustive elements called environment and symbolized by the Greek letter □
   a. Dumb-shuffer
   b. Dempster-Shafer
   c. Dumb-shafer
   d. Dempster-shuffer
3. ……..refers to minimizing the local uncertainties.
   a. verification
   b. Voting
   c. Validation
   d. Ad hoc method
4. ……. is the most general theory of uncertainty formulated to date and has wide applicability due to the extension principle
   a. Fuzzy theory
   b. Dempster-Shafer
   c. Fuzzy- shuffer
   d. Dempster-shuffer
5. An environment is called……. when elements may be interpreted as possible answer, and only answer is correct
   a. Frame of differences
   b. Frame of interpretation
   c. Frame of discernment

d. Answer Frames

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EXPERT SYSTEMS MCQ

Chapter 1

1. The first step in solving a problem is …..
   a. in defining problem area or domain
   b. interrogating the users of the system
   c. doing a. and b.
   d. in finding the cause of the problem

2. The following are some areas of AI.
   i. Robotics
   ii. Knowledge Inference
   iii. Natural Language
   iv. Expert System
   a. I, II b. II, IV c. I, II, IV **d. I, III, IV**

3. Which component of the expert system contains much of the problem solving knowledge?
   a. Inference Engine
   b. Knowledge Base
   c. Knowledge Domain
   d. User Interface

4. The expertise is skilled in a particular problem domain, his knowledge about (used in this solving) a specific problem is called……
   a. Inference
   b. Workspace
   c. **Knowledge Domain**
   d. Rule Base

5. The problem domain is always a superset of the knowledge domain.
   a. True
   b. False
   c. Maybe

Chapter 2

1. What type of logic is more rigorous in showing that a conclusion drawn is right?
   a. Informal Logic
   b. Symbolic Logic
   c. Operative Logic
   d. Preemptive Logic
   NB: symbolic logic is another name for formal logic

2. Knowledge affects the following of the system.
i. Development
ii. Efficiency
iii. Speed
iv. Maintenance
   a. I, II b. IV, II c. III **d. I, II, III, IV**

3. Epistemology is ……..
   a. The formal study of inference
   b. The study of nature and structure of Knowledge
   c. The formal study of knowledge
   d. Concerned with only philosophy, declarative and tacit

4. How many levels are there in the pyramid of knowledge?
   a. 3 **b. 6** c. 8 d. 4

5. A ……. is a group of slots and fillers that defines a stereotypical object that is used to represent generic / specific knowledge.
   a. Framework
   b. Workspace
   c. Frame
   d. Schemata

Chapter 3

1. Which language in the 1990's by using backward chaining divides problems into smaller units and solves them?

a. LISP
b. PROLOG
c. CLISP
d. FORTRAN

2. Another name for a graph is
   a. **Networ**k
   b. Acyclic
   c. Simple
   d. Cyclic

3. What is a digraph?
   a. A graph that moves in one direction.
   b. A graph that moves in two directions.
   c. A graph that is connected by links
   d. A graph with directed links

4. Why will a tree be termed as a hierarchical data structure? This is because…….
   a. It has stem, leaves and root
   b. It has nodes and branches
   c. It has children
   d. It has root.

5. Deductive logic can determine the …… of an argument.
   a. Validity
   b. Accuracy
   c. Strength
   d. Conclusion

Chapter 4

1. The lack of essential information in making or formulating a decision is referred to as……..
   a. Poor Inference
   b. Weak Knowledge Base
   c. Uncertainty
   d. Unsteady Knowledge Domain

2. Which types of errors deals with precision & accuracy and inductive & deductive respectively?
   a. Ambiguous and Incorrect error
   b. Incomplete and Reasoning
   c. Random and Systematic
   d. Measurement and Reasoning

3. ……. deals with events that are not reproducible and have no historical basis on which to extrapolate.
   a. Compound Probability
   b. Conditional Probability
   c. Experimental Probability
   d. Subjective Probability

4. …….. defines the probability of an event, as the limit of a frequency distribution:
   a. Subjective Probability
   b. Experimental Probability
   c. Compound Probability
   d. Conditional Probability

5. The probability illustrated is……..

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(A \cap B) = P(A|B)\, P(B)$$

   a. Conditional Probability
   b. Compound Probability
   c. Additive Law
   d. Bayes' Theorem

1. In rule-based expert system, there is room for uncertainty. This uncertainty can be in …… major form. These are:……..
   a. 4, namely: conflict resolution, explicit priority of rule, missing rules and individual rules
   b. 5, namely: data fusion, missing rules, antecedent, consequent and error
   c. 3, namely: individual rules, conflict resolution and incompatibility of rules
   d. 2, namely: explicit priority of rule and implicit priority of rule.

2. One way to solve the issue of uncertainty in an expert system is the use of the certainty factor. What then is the certainty factor?
   a. It is a way of combining beliefs and disbeliefs into a single number
   b. It is the factor that shows how an uncertainty can be solved
   c. a and b
   d. none of the above

3. Which theory attempted to model uncertainty by a range of probabilities rather than a single probabilistic number?
   a. Bayesian Theory
   b. Dempster – Shafer Theory
   c. Shannon Theory
   d. Zadeh's Fuzzy Theory

4. A fuzzy truth value is called a fuzzy qualifier.
   a. True
   b. False

5. The …….. defines how to extend the domain of a given crisp function to include fuzzy sets.
   a. Extended Principle
   b. Extensive Principle
   c. External Principle
   d. Extension Principle

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CHAPTER 82

1) _____ is a computer system that emulates, or acts in all respects, with the decision-making capabilities of a human expert.
   a) Artificial Intelligence
   b) Smart system
   c) Intelligent system
   d) Expert System
2) Which of the options below is an area of artificial intelligence?
   a) Expert System
   b) Robotics
   c) Vision
   d) All the above
3) Expert System relies on _____ .
   a) Induction
   b) Inference
   c) Abduction
   d) Deduction
4) _____ is based on empirical and heuristic knowledge.
   a) Deep knowledge
   b) Short Knowledge
   c) Shallow knowledge
   d) Long knowledge
5) _____ is based on basic structure, function, and behavior of objects.

a) Deep knowledge
b) Short Knowledge
c) Shallow knowledge
d) Long knowledge

Chapter 2

1) _____ is the study of making inferences.
   a) Logic
   b) Inference engine
   c) Knowledge base
   d) Inductions
2) _____ refers to the meanings we give to symbols.
   a) Axiomatics
   b) Semantics
   c) Lexis
   d) Linguistics
3) _____ refers to using experience to solve problems.
   a) Inference
   b) Heuristics
   c) Logistics
   d) Semantics

CHAPTER 83

4) _____ is the formal study of knowledge .
   a) Epistemology
   b) Heuristics
   c) Logistics
   d) Induction
5) _____ searches for underlying patterns.
   a) Expert system
   b) ANS
   c) None
   d) Both

Chapter 3

1) The top node is the _____, occupying the highest hierarchy of the tree.
   a) Leaf
   b) Root
   c) Branch
   d) Node-0
2) Degenerate trees have __ pathway from root to its one leaf.
   a) 0
   b) 1
   c) 2
   d) 3
3) _____ graphs have no cycles.
   a) Diagraph
   b) Binary Graph
   c) Simple graph
   d) Acyclic graph
4) _____ can be used to define an object's behavior.
   a) State space
   b) Lattice
   c) Tree
   d) Decision tree
5) PROLOG uses _____ to divide problems into smaller problems and then solves them.
   a) Forward chaining
   b) Backward chaining
   c) Diagonal chaining
   d) Sideways chaining

Chapter 4

1) With _____ all the facts must be known to arrive at an outcome.
   a) Decision trees
   b) Expert systems
   c) Both

d) None

2) _____ is essentially lack of information to formulate a decision.
   a) Certainty
   b) Hartley theory
   c) Shannon theory
   d) Uncertainty
3) Classical probability was first proposed by _____
   a) Newton
   b) Pascal
   c) Openheimer
   d) Pascal and Fermat
4) When repeated trials give the exact same results, the system is _____.
   a) Non-deterministic
   b) Deterministic
   c) Random
   d) Experimental
5) _____achieved great fame as the first expert system to discover a valuable molybdenum deposit worth $100,000,000.
   a) INSPECTOR
   b) PROSPECTOR
   c) DEPOSITOR
   d) DISCOVERER

Chapter 5

1) The knowledge engineer endeavors to minimize, or eliminate, _____ if possible.
   a) Certainty
   b) Randomness
   c) Uncertainty
   d) Money
2) _____ refers to minimizing the global uncertainties of the entire expert system.
   a) Validation
   b) Verification
   c) Certifying
   d) Decertifying
3) The Dempster-Shafer Theory is a method of _____ reasoning.
   a) Exact
   b) Inexact
   c) Inductive
   d) Deductive
4) Approximate Reasoning is theory of uncertainty based on _____
   a) Fuzzy Logic
   b) Dempster-Shafer theory
   c) Fuzzy set
   d) Classical theory

CHAPTER 85

5) One of the following is not applications of fuzzy logic:
   a) Control algorithms
   b) Hacking
   c) Science
   d) Literature

Chapter 6

1) The first stage in system development is _____ .
   a) Feasibility study
   b) Field testable
   c) Maintenance
   d) Testing
2) Planning is a task under _____
   a) Activity management
   b) Resource management
   c) Project configuration management
   d) Prototyping
3) Analysis is a task under _____
   a) Activity management
   b) Resource management
   c) Project configuration management
   d) Prototyping
4) Acquiring resources is a task under _____
   a) Activity management
   b) Resource management
   c) Project configuration management
   d) Prototyping
5) Scheduling is a task under _____
   a) Activity management
   b) Resource management
   c) Project configuration management
   d) Prototyping

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Expert Systems

<u>Chapter one (1)</u>

1. "An expert system is a computer system that emulates, or acts in all respects, with the decision-making capabilities of a/an……?

a. Human
b. Human Expert
c. Intellect

2. Who gave the above definition of an expert system?
   a. Dr. Fredrick Watson
   b. Prof. Joey Columbus
   c. Professor Edward Feigenbaum
3. The main components of Expert systems include: Knowledge base and……?
   a. Database
   b. AI
   c. Inference engine.
4. The expert's knowledge about solving specific problems is called
   a. Knowledge Domain
   b. Intellectual domain
   c. Wisdom domain
5. Classic AI programs include:
   a. JavaScript and PHP
   b. PROLOG AND CLISP
   c. Jython and Python

Chapter Two(2)

1. Logic is the study of making……?
   a. Inferences
   b. Analysis
   c. Final Clues.
2. Which is not part of the goals of Expert systems?
   a. We need to make inferences w/o relying on semantics.
   b. We need to reach valid conclusions based on facts only.
   c. We need to begin if we know a system's functionality.

3. ……..is the key to the success of expert systems.
   a. Correct Database
   b. Knowledge Representation
   c. Effective Conclusion
4. The process of reaching valid conclusions is referred to as……..
   a. Logical Reasoning
   b. Inference logic
   c. Augmented logic
5. ……..is the formal study of knowledge.
   a. Epidemiology

b. Ectomology
c. Epistemology

Chapter three (3)

1. ……is a/an hierarchical data structure.
   a. Stack
   b. Queue
   c. Tree
2. The answer in one (1) consists of……..
   a. Nodes and Branches
   b. List and sequences
   c. Order of numbers.
3. ……are sometimes called a network or net.
   a. Lists
   b. Graphs
   c. Trees
4. Simple Graphs have loops.
   a. True
   b. False
   c. None of the above
5. Decision trees are useful for representing and reasoning about……
   a. Wisdom
   b. Knowledge
   c. Logic

Chapter four (4)

1. Probability theory is devoted to dealing with theories of……
   a. Certainty
   b. Uncertainty
   c. Knowledge
2. ……is essentially lack of information to formulate a decision.
   a. Certainty
   b. Knowledge
   c. Uncertainty
3. Which is not part of the theories of dealing with uncertainty?

   a. **Columbus' Theory**
   b. Bayesian Probability
   c. Hartley's Theory
4. When rules are based on heuristics, there will be……?
   a. Certainty
   b. Uncertainty
   c. Knowledge
5. Bayes' Theorem is commonly used for decision tree analysis of business and…….
   a. Computing
   b. Science
   c. Social Sciences

Chapter five (5)

1. The knowledge engineer endeavors to minimize, or eliminate……..
   a. Certainty
   b. Uncertainty
   c. Knowledge
2. ……is concerned with the correctness of the system's building blocks – rules.
   a. Validation
   b. Correction
   c. Verification
3. ……refers to minimizing the global uncertainties of the entire expert system.
   a. Validation
   b. Correction
   c. Verification
4. Sources of Uncertainty include:
   a. Assumption of rules
   b. Potential contradiction of rules
   c. Assertion of rules

5. ……is a method of inexact reasoning.
   a. Columbus' Theory
   b. Bayes' Theory
   c. Dempster-Shafer Theory

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EXPERT SYSTEMS

CHAPTER ONE

6. What is an expert system?

An expert system is a program that attempts to mimic human expertise by applying inference methods to a specific body of knowledge.

7. Expert systems is a branch of AI that makes extensive use of specialized knowledge to solve problems at the level of a _____.
   a. Artificial expert b**. human expert** c.human intelligence d. artificial intelligence
8. Which of the following is an element of an expert system?
   b. User mode b. **agenda** **c.** expert d. experience
9. In 1960, ---------- and ---------- wrote computer programs to test the hypothesis that intelligent behavior resulted from heuristic search.
   Answer: Allan Newell, Herbert Simon

10. Who is an EXPERT?
    Expertise is task-specific knowledge acquired and developed from training, reading and experience.

CHAPTER TWO

VI. A set of terminals is called _____ of language.
a.character b. **string** c. integer d. word

VII. A _____ is a complete set of production rules that defines a language unambiguously.
a. Sentence b. **grammer** c. string d. character

VIII. An expert system can be used anywhere, any time.
a. **True** b. False

IX. Human experts are 100% reliable or consistent
b. True b. **False**

X. DENDRAL: Used to identify the structure of chemical compounds.
b. **True** b. False

CHAPTER THREE

6. If an ES gives a wrong conclusion, it may be difficult to know whether this was caused by an error in the system or by an error in the information given to it.

b. **True** b. False

7. An ideal ES should include which of the following?

d. **Symbolic processing**.
e. Open to inspection
f. technical capabilities

8. Which of the following is/are not expert system development tools?

e. Symbolic Programming
f. ES Shells
g. Human expert
h. Conventional Programming

9. One of the disadvantages of ES is Expert systems are difficult and expensive to develop and maintain.
   True b. False
10. Which of the following does not describe Expert system?

e. Easily modified,
f. Heuristic
g. **Symbolic processing**
h. Open to inspection

CHAPTER FOUR

VI. State the Three-phase process in Decision making process

Intelligence phase, Design phase and Choice phase

VII. Explain the phases stated above in (Q16)
   a. **Intelligence phase**: collect the necessary information
   b. **Design phase**: method for considering data is designed
   c. **Choice phase**: select alternative

VIII. A representation of reality is called -------

Ans. **Model**

IX. ---------- is sequence of steps

Ans. **Algorithm**

X. ------- are categories of data considered in algorithm

Ans.

The expert system development lifecycle

CHAPTER FIVE

6. State the Phase 2: System analysis & design
   a. Produce conceptual design
   b. Decide development strategy

c. Decide sources of knowledge, and ensure co-operation
d. Select computer resources
e. Perform a feasibility study
f. Perform a cost-benefit analysis

7. State the phase 1: project initialization
a. Problem definition
b. Needs assessment
c. Evaluation of alternative solutions
d. Verification that an ES approach is appropriate
e. Consideration of management issues

8. State Phase 5: Implementation
a. Ensure acceptance by users
b. Install, demonstrate and deploy the system
c. Arrange orientation and training for the users
d. Ensure security
e. Provide documentation
f. Arrange for integration and field testing

9. State Phase 3: Prototyping
a. Build a small prototype
b. Test, improve and expand it
c. Demonstrate and analyse feasibility
d. Complete the design

10. State Phase 4: System development
a. Build the knowledge base
b. Test, evaluate and improve the knowledge base
c. Plan for integration

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Chapter one

1. All the following are areas of artificial intelligence except:
A. Vision

B. Expert systems
C. Robotics
D. None of the Above

2. An expert system is a computer system that emulates, or acts in all respect, with the decision-making capabilities of a human expert.
A. True
B. False

3. ” An expert system is a computer system that emulates, or acts in all respect, with the decision-making capabilities of a human expert.” As quoted by:
A. Professor Edward Feigenbaum
B. Professor Edwin Feigenbaum
C. Professor Edward Feigenberg
D. Professor Edwin Feigenberg

4. Expert system technologies may include:
A. Special expert system languages
B. Programs
C. Hardware designed to facilitate the implementation of those systems.
D. All of the above.

5. Inference engine draws conclusions from the knowledge base
A. True
B. False

Chapter two

1. The process of reaching valid conclusions is referred to as logical reasoning
A. True
B. False

2. Epistemology is the informal study of knowledge.
A. True
B. False

3. Epistemology is concerned with
    A. Nature
    B. Structure
    C. Origins of knowledge
    D. All the above

4. All the following are categories of epistemology except
    A. A priori
    B. A posteriori
    C. Declarative
    D. An exterior

5. All the following are characteristics of a Priori knowledge except
    A. “That which precedes”
    B. Independent of the sense
    C. Universally false
    D. Cannot be denied without contradiction

Chapter three

1. The node of a tree is at the bottom whiles the leaves are at the top
    A. True
    B. False

2. A tree is a linear data structure consisting of nodes and branches
    A. True
    B. False

3. All the followings are true about a tree except
    A. Every node, except the root, has exactly one parent
    B. Every node may give rise to one child nodes
    C. A binary tree restricts the number of children per node to a maximum of two
    D. Degenerate trees have only a single pathway from root to its one leaf.

4. There is a distinction between parent and child in qraphs
    A. True
    B. False

5. All the followings are true about graphs except
    A. A cyclic graphs have no cycles
    B. Lattice is a directed acyclic graph
    C. Connected graphs have links to some of the nodes but not to all the nodes.
    D. None of the above

Chapter four

1. Which of the following theories deals with uncertainty
    A. Bayesian probability
    B. Hartley theory
    C. Both A and B
    D. Only A

2. …….. deals with exact facts and exact conclusions
    A. Deductive reasoning
    B. Inductive reasoning
    C. Subjective reasoning
    D. Objective reasoning

3. …….. reasoning is not strong as deductive reasoning. Premises support the conclusion but do not guarantee it.
    A. Deductive reasoning
    B. Inductive reasoning
    C. Subjective reasoning
    D. Objective reasoning

4. In error hypothesis accepting a hypothesis when it is not true is known as ……..
    A. False Negative
    B. False Positive
    C. True Negative
    D. True Positive

5. In error hypothesis rejecting a hypothesis when it is true is known as ……..
    E. False Negative
    F. False Positive
    G. True Negative

H. True Positive

Chapter five

1. The knowledge engineer endeavors to maximize or eliminate uncertainty if possible.
   A. True
   B. False

2. Minimizing uncertainty is part of the verification of rules.
   A. True
   B. False

3. Verification is concerned with the correctness of the system's building blocks-rules.
   A. True
   B. False

4. If all the rules are correct, it means that the system will give the correct answer.
   A. True
   B. False

5. Uncertainties are concern with creation of the rules and also with the assignment of values.
   A. True
   B. False

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Chapter 1

1. A prioritized list of rules created by the inference engine, whose patterns are satisfied by facts or objects in working memory is known as ……..
   a) Rule Engine
   b) Agenda
   c) User interface
   d) Knowledge base
2. Production rules can be expressed in IF-THEN pseudocode format.
   a) True
   b) False
3. The mechanism by which the user and system communicate is ……..

a) Communication mechanism
b) System interface
c) Communication layer
d) User interface

4. An …… is an ideal solution guaranteed to yield a solution in a finite amount of time
   a) Artificial solution
   b) Algorithm
   c) Inference engine
   d) Expert system
5. Knowledge base is also called ……..
   a) Information station
   b) Data store
   c) Production memory
   d) Database

Chapter 2

1. …… is the study of making inferences.
   a) Logic
   b) Inference making
   c) Intelligence
   d) Expert systems
2. …….. is a more rigorous approach to proving a conclusion to be true / false.
   a) Mathematical Inference
   b) Scientific logic
   c) Truth table
   d) Formal logic
3. The process of reaching valid conclusions is referred to as ……
   a) Argument
   b) Logical reasoning
   c) Propositional logic
   d) Scientific method
4. Epistemology is the formal study of …….
   a) Logic
   b) Knowledge
   c) Epistles
   d) Expert system
5. Defines a set of axioms consisting of symbols to represent objects / classes.
   a) Axiom set
   b) Symbolic set
   c) Boolean logic
   d) Propositional logic

Chapter 3

CHAPTER 97

1. A tree is a hierarchical data structure consisting of
   a) Leaves and branches
   b) Roots and stems
   c) Nodes and branches
   d) Fruits and leaves
2. A circuit is a path through the graph beginning and ending with the same node.
   a) True
   b) False
3. Inference from the specific case to the general is
   a) Deduction
   b) Induction
   c) Intuition
   d) Heuristics
4. Reasoning back from a true condition to the premises that may have caused the condition is called ……..
   a) Intuition
   b) Induction
   c) Deduction
   d) Abduction
5. Syllogism has two premises and one conclusion
   a) True
   b) False

Chapter 4

1. Uncertainty is the lack of information to formulate a decision
   a) True
   b) False
2. The following are theories to deal with indecisiveness except ……..
   a) Hartley theory
   b) Shannon theory
   c) Hartley theory
   d) Doorstep theory
3. …… deals with exact facts and exact conclusions
   a) Inductive reasoning
   b) Abductive reasoning
   c) Deductive reasoning
   d) Conductive reasoning
4. ……. has premises that support the conclusion but do not guarantee it
   a) Deductive reasoning
   b) Inductive reasoning
   c) Conductive reasoning
   d) Abductive reasoning
5. Errors of accuracy shows how well the truth is known.
   a) True

b) False

Chapter 5

1. Maximizing uncertainty is part of the verification of rules.
   a) True
   b) False
2. Minimizing the local uncertainties refers to
   a) Specification
   b) Verification
   c) Fact finding
   d) Validation
3. ……. refers to minimizing the global uncertainties of the entire expert system
   a) Verification
   b) Specification
   c) Validation
   d) Fact finding
4. The Dempster-Shafer Theory is a method of exact reasoning
   a) True
   b) False
5. In fuzzy logic, possibility refers to allowed values
   a) True
   b) False

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OWUSU GABRIEL

EXPERT SYSTEMS

CHAPTER ONE

11. What is an expert system?

An expert system is a program that attempts to mimic human expertise by applying inference methods to a specific body of knowledge.

12. Expert systems is a branch of AI that makes extensive use of specialized knowledge to solve problems at the level of a _____.
    a. Artificial expert b**. human expert** c.human intelligence d. artificial intelligence
13. Which of the following is an element of an expert system?
    c. User mode b. **agenda** **c.** expert d. experience

14. In 1960, ---------- and ---------- wrote computer programs to test the hypothesis that intelligent behavior resulted from heuristic search.
Answer: Allan Newell, Herbert Simon

15. Who is an EXPERT?
Expertise is task-specific knowledge acquired and developed from training, reading and experience.

CHAPTER TWO

XI. A set of terminals is called _____ of language.
a.character b. **string** c. integer d. word

XII. A _____ is a complete set of production rules that defines a language unambiguously.
a. Sentence b. **grammer** c. string d. character

XIII. An expert system can be used anywhere, any time.
b. **True** b. False

XIV. Human experts are 100% reliable or consistent
c. True b. **False**

XV. DENDRAL: Used to identify the structure of chemical compounds.
c. **True** b. False

CHAPTER THREE

11. If an ES gives a wrong conclusion, it may be difficult to know whether this was caused by an error in the system or by an error in the information given to it.
c. **True** b. False

12. An ideal ES should include which of the following?
g. **Symbolic processing**.
h. Open to inspection
i. technical capabilities

13. Which of the following is/are not expert system development tools?
i. Symbolic Programming
j. ES Shells
k. Human expert
l. Conventional Programming

14. One of the disadvantages of ES is Expert systems are difficult and expensive to develop and maintain.
True b. False

15. Which of the following does not describe Expert system?
i. Easily modified,

j. Heuristic
k. **Symbolic processing**
l. Open to inspection

CHAPTER FOUR

XI. State the Three-phase process in Decision making process

Intelligence phase, Design phase and Choice phase

XII. Explain the phases stated above in (Q16)

a. **Intelligence phase**: collect the necessary information
b. **Design phase**: method for considering data is designed
c. **Choice phase**: select alternative

XIII. A representation of reality is called -------

Ans. **Model**

XIV. ---------- is sequence of steps

Ans. **Algorithm**

XV. ------- are categories of data considered in algorithm

Ans.

The expert system development lifecycle

CHAPTER FIVE

11. State the Phase 2: System analysis & design
    a. Produce conceptual design
    b. Decide development strategy
    c. Decide sources of knowledge, and ensure co-operation
    d. Select computer resources
    e. Perform a feasibility study
    f. Perform a cost-benefit analysis

12. State the phase 1: project initialization
    a. Problem definition
    b. Needs assessment
    c. Evaluation of alternative solutions
    d. Verification that an ES approach is appropriate
    e. Consideration of management issues

13. State Phase 5: Implementation

a. Ensure acceptance by users
b. Install, demonstrate and deploy the system
c. Arrange orientation and training for the users
d. Ensure security
e. Provide documentation
f. Arrange for integration and field testing

14. State Phase 3: Prototyping
    a. Build a small prototype
    b. Test, improve and expand it
    c. Demonstrate and analyse feasibility
    d. Complete the design

15. State Phase 4: System development
    a. Build the knowledge base
    b. Test, evaluate and improve the knowledge base
    c. Plan for integration

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Expert Systems Questions

Chapter 1

1. A/an ……..is a computer system that emulates or acts in all respects with the decision making capabilities of a human expert.
   a. Expert System
   b. Knowledge System
   c. Robotics
   d. AI

2. ……. Is used in medical diagnosis of illness.
   a. PROSPECTOR
   b. MYCIN
   c. DIPMETER
   d. DENDRAL

3. ……. is used in configuring computer systems.
   a. **PROSPECTOR**
   b. MYCIN
   c. DIPMETER
   d. XCON/RI

4. ……. is used in geological data analysis for oil.
   a. PROSPECTOR
   b. MYCIN
   c. DIPMETER
   d. DENDRAL

5. The expert's knowledge about solving specific problems is called …….
   a. Knowledge Domain
   b. Solution Domain
   c. Research Domain
   d. Problem Domain

Chapter 2

6. In expert systems, an ……. is the metaknowledge that describes everything known about the problem domain.
   a. Semantic net
   b. ANS
   c. Ontology
   d. Conceptual graph

7. Semantic nets consists of ……. and …….
   a. Objects and Relationships
   b. Propositions and Prepositions
   c. Nodes and Arcs
   d. Atoms and Chains

8. In PROLOG, a predicate expression consists of the ..... followed by zero or more ……. enclosed in ……. separated by commas.
   a. Predicate name, Arguments, Parenthesis
   b. Predicate name, Inferences, Parentheses
   c. Expression header, Logical expressions, Parenthesis
   d. Predicate name, Logical expression, Parenthesis

9. The OAV triplet can be used to characterize all the knowledge in a semantic net. OAV stands for?
   a. Objective-Allocation-Valuation
   b. Object-Allocation-Value
   c. Objective-Attribute-Valuation
   d. Object-Attribute-Value

10. In propositional logic, a statement that is neither a tautology nor a contradiction is called a …….
   a. Material Implication
   b. Contingent statement
   c. Biconditional
   d. Open sentences

Chapter 3

11. A ……. is a hierarchical structure consisting of nodes and branches.
   a. Linked list
   b. Struct
   c. Tree
   d. Net

12. What type of tree has only a single pathway from the root to its one leaf?
   a. Binary tree
   b. Degenerate tree
   c. Lean tree
   d. Atomic tree

13. A ……. is a diagram describing the finite number of states of a machine.
   a. ANS
   b. DNS
   c. FSM
   d. FGM

14. In the types of Logic, Intuition is explained as ……..
    a. No proven theory
    b. Rules of thumb based on experience
    c. Trial and error
    d. Reasoning where conclusions must follow from premises

15. In the types of Logic, Heuristics is explained as ……..
    a. No proven theory
    b. Rules of thumb based on experience
    c. Trial and error
    d. Reasoning where conclusions must follow from premises

Chapter 4

16. Inductive reasoning
    a. Deals with exact facts and exact conclusion
    b. Support the conclusion but do not guarantee it
    c. A form of declarative knowledge
    d. Using knowledge in beneficial way

17. Which of the following deals with exact facts and exact conclusion
    a. Inductive reasoning
    b. Uncertainty
    c. Logic
    d. **Deductive reasoning**

18. Logic system provides an advantage when dealing with
    a. Logic
    b. Uncertainty
    c. Humans
    d. Semantic nets

19. Rejecting a hypothesis when it is true is
    a. False positive
    b. False negative

c. Semantic nets
d. Inductive reasoning

20. Random fluctuations are also termed as
a. Systematic errors
b. Random error
c. False negative
d. Error of precision

Chapter 5

21. A theory that attempts to model uncertainty by a range of probabilities rather a single probabilistic number is
a. **Dempster-Shafer**
b. Propagation of Probabilities
c. Approximate Reasoning
d. Inference Nets

22. Which principle defines how to extend the domain of a given crisp set function to include fuzzy sets.
a. Approximate principle
b. **Extended principle**
c. Fuzzy set principle
d. Crisp set principle

23. Conditional, conjunctive, disjunctive fall under which category of translation rules.
a. Modification rules
b. Quantification rules
c. **Composition rules**
d. Qualification rules

24. The certainty factor, CF, is way of combining _____ and _____ into a single number.
    a. Belief and truth
    b. Disbelief and falsehood
    c. **Belief and disbelief**
    d. Truth and falsehood

25. The certainty factor can be used to rank _____ in order of importance.
    a. Truth
    b. Belief
    c. Evidence
    d. **Hypothesis**

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COURSE: EXPERT SYSTEMS I

CHAPTER 1

1. A/an ……..is a computer system that emulates or acts in all respects with the decision making capabilities of a human expert.
    a. **Expert System**
    b. Knowledge System
    c. Robotics
    d. AI

2. The expert's knowledge about solving specific problems is called ……
    a. **Knowledge Domain**
    b. Solution Domain
    c. Research Domain
    d. Problem Domain

3. …… is always a superset of the ……
    a. Knowledge Domain, Problem Domain
    b. Problem Domain, Research Domain
    c. **Problem Domain, Knowledge Domain**
    d. Solution Domain, Research Domain

4. ……is used in chemical mass spectroscopy to identify chemical constituents.

a. PROSPECTOR
b. MYCIN
c. DIPMETER
d. **DENDRAL**

5. …… Is used in medical diagnosis of illness.

a. PROSPECTOR
b. **MYCIN**
c. DIPMETER
d. DENDRAL

5. …… is used in geological analysis for minerals.

a. **PROSPECTOR**
b. MYCIN
c. DIPMETER
d. DENDRAL

CHAPTER 2

1. …… is the study of making inferences given a set of facts

a. Wisdom
b. **Logic**
c. Semantics
d. Argument

2. …… refers to the meanings we give to symbols

a. Logic
b. Argument

c. **Semantics**

d. Inference

3. Expert systems are designed for knowledge representation based on rules of logic called ……

a. Logic

b. Semantics

c. **Inferences**

d. Arguments

4. An ……refers to the formal way facts and rules of inferences are used to reach valid conclusions.

a. **Argument**

b. Rules

c. Epistemology

d. Tacit

5. Which of the following is not a category of epistemology?

a. Philosophy

b. Tacit

c. Apriori

d. **Uncertainty**

CHAPTER 3

1. A…… is a hierarchical structure consisting of nodes and branches.

a. Linked list

b. Struct

c. **Tree**

d. Net

2. What type of tree has only a single pathway from the root to its one leaf?

a. Binary tree

b. **Degenerate tree**

c. Lean tree

d. Atomic tree

3. A…… is a diagram describing the finite number of states of a machine.

a. ANS

b. DNS

c. **FSM**

d. FGM

4. In the types of Logic, Intuition is explained as ……

a. **No proven theory**

b. Rules of thumb based on experience

c. Trial and error

d. Reasoning where conclusions must follow from premises

5. In the types of Logic, Heuristics is explained as ……

a. No proven theory

b. **Rules of thumb based on experience**

c. Trial and error

d. Reasoning where conclusions must follow from premises

CHAPTER 4

1. Logic system provides an advantage when dealing with
   a. Logic
   b. **Uncertainty**
   c. Humans
   d. Semantic nets

2. Which of the following deals with exact facts and exact conclusion
   a. Inductive reasoning
   b. Uncertainty
   c. Logic
   d. **Deductive reasoning**

3. Accepting a hypothesis when it is not true is
   a. **False positive**
   b. False negative
   c. Semantic nets
   d. Inductive reasoning

4. Inductive reasoning
   a. Deals with exact facts and exact conclusion
   b. **Support the conclusion but do not guarantee it**
   c. A form of declarative knowledge
   d. Using knowledge in beneficial way

5. Rejecting a hypothesis when it is true is
   a. False positive
   b. **False negative**
   c. Semantic nets
   d. Inductive reasoning

CHAPTER 5

1. Two of the following are not sources of uncertainty that expert systems operate in

   i. Conflict resolution

   ii. Knowledge base

   iii. Individual views

   iv. Incompatibility of rules

a. I and ii
b. ii and iii
c. iii and iv
d. i and iii

Answer **b**

2. The certainty factor, CF, is way of combining _____ and _____into a single number.

a. Belief and truth

b. Disbelief and falsehood
c. Belief and disbelief
d. Truth and falsehood

Answer **c**

3. The certainty factor can be used to rank _____in order of importance.

a. Truth

b. Belief
c. Evidence
d. Hypothesis

Answer **d**

4. In MYCIN, suppose another rule also concludes the same hypothesis, but with a different certainty factor, the certainty factor of rules concluding the same hypothesis are calculated from the _____.

a. Certainty function
b. Reduction function
c. Combining function
d. Attenuation function

Answer **c**

5. A theory that attempts to model uncertainty by a range of probabilities rather a single probabilistic number is
   a. Dempster---Shafer
   b. Propagation of Probabilities
   c. Approximate Reasoning
   d. Inference Nets
   Answer **a**

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Expert system Assignment

1.Knowledge representation is the key to the success of expert systems
a).True
b).False

2.Categories of Epistemology includes the following expect
a).Philosophy
b).Declaration
c).Logic
d).A priori

3.A tree is hierarchical data structure consisting of
a).Nodes and leaves
b).Branches and leaves
c).Leaves and roots
d).Nodes and Branches

4.The following are all advantages of Expert System except
a).reduced cost
b).reduced danger
c).Perfomance
d).Slow response

5.Logic is the study of making .....
a).Technology
b).inference
c).artificial intelligence
d).expert system

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Chapter 1

1. Expert system emulate decision-making of human _____.

A. Child B. Exploits

C. **Expert** D. Experience

2. The following are areas of AI **except**

A. Vision B. Natural language

C. Speech D. **Touch**

3. The main components of Expert System are

A. Base Knowledge and Interference

B. **Knowledge Base and Inference Engine**

C. Engine Interference and Wisdom Base

D. Wisdom Base and Inference Engine

4. A problem domain is always the superset of the knowledge domain

A. True B. False

5. Knowledge base is also called _____.

A. Production Cache B. Producing Rule

C. Production Rules **D. Production Memory**

Chapter 2

1. Logic is the study of making _____.

A. Infernos B. Interferences

C. Inferences D. Internals

2. Epistemology is the formal study of knowledge.

A. True B. False

3. The process of reaching valid conclusion is referred to as

A. Logic **B. Logical Reasoning**

C. Argument D. Valid Conclusion

4. Which is not is not a category of epistemology

A. Psychology B. Apriori

C. Tacit D. Declarative

5. _____ is knowledge about knowledge and expertise.

A. Metalknowledge B. Meatknowledge

C. Metaknowledge D. Meanknowledge

Chapter 3

1. Syllogism was developed by Aristotle.

A. True B. False

2. ANS makes inferences and searches for underlying patterns

A. True **B. False**

3. Tacit knowledge cannot be expressed by language

A. True B. False

4.Which is not an example of knowledge representation techniques

A. Rules **B. Law**

C. Logic D. Frames

5. Propositions are atomic

A. True B. False

Chapter 4

1. Uncertainty is essentially lack of _____ to formulate a decision.

A. Formation **B. Information**

C. Wisdom D. Understanding

2. Which is not a theory to deal with uncertainty.

A. Swann Probability B. Hartley theory

C. Shannon Theory D. Markov Models

3. Errors related to Measurement include all **but**

A. Errors of Accuracy B. Errors of precision

C. Unreliability **D. Syntax errors**

4. Expert system must be designed to fit the real world and not vice versa.

A. True B. False

5. All but one is not a type of belief

A. Faith B. Impossible

C. Plausible D. Certain

Chapter 5

1. A knowledge engineer endeavors to maximize uncertainty at all cost.

A. True **B. False**

2. Verification is concerned with the correctness of the system's building blocks.

A. True B. False

3. _____ uncertainty is part of the verification of rules.

A. Minimizing B. Decline

C. Maximize D. Minimax

4. _____ refers to minimizing the global uncertainties of the entire expert system.

A. Validation B. Verification

C. Conclusion D. Inference

5. _____ refers to minimizing the local uncertainties.

A. Validation **B. Verification**

C. Conclusion D. Inference

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CHAPTER 1

1. An expert system is a computer system that emulates, in all respects, with the……..capabilities of a human expert.

a. decision making c. learning

b. reasoning d. intelligence

2. Which of the following is not an area of Artificial Intelligence?

a. Vision b. Understanding

c. Robotics **d. Listening**

3. An expert's knowledge is specific to one problem domain.

a. True b. False

4. The problem domain is always a subset of the knowledge domain.

a. True **b. False**

5. Which of the following is **not** an advantage of expert systems.

a. Increased availability
b. Reduced cost
c. Increase in expert's knowledge
d. Reduced danger

CHAPTER 2

1. Logic is the study of making inferences

a. True
b. False

2. Semantics refers to the meanings we give to symbols

a. True
b. False

3. Expert systems are designed for knowledge representation based on rules of logic called …….

a. Intelligence
b. Statistics
c. Inferences
d. Probability

4. Knowledge affects the development, efficiency, speed and maintenance of a system

a. True
b. False

5. The process of reaching valid conclusions is called…….

a. logical reasoning
b. machine learning
c. intelligence
d. efficiency

CHAPTER 3

1. The nodes in a hierarchical data structure consisting of nodes to……..

a. connect other nodes **b. store information**

c. display information d.

2. The node of highest hierarchy is called……

a. top node b. highest node

c. root node d. parent node

3……. trees have only a single pathway from root to one of its leaves

a. Single b. Connected

c. Direct **d. Degenerate**

4. Connected graphs have links to all nodes.

a. True b. False

5. …….. is a directed acyclic graph.

a. Lattice b. Digraph

c. Connected graph c. Circuit

CHAPTER 4

1. …… is essentially the lack of information to formulate a decision.

a. Uncertainty b. Ambiguity

c. Entropy d. Digression

2. Which of the following is not a theory to deal with uncertainty?

a. Shannon Theory b. Hartley Theory

c. Von Neumann Theory d. Markov Models

3. Deductive reasoning deals with exact facts and exact conclusions.

a. False. **b. True**

4. ……. error occurs when a hypothesis is accepted when it is not true.

a. Type I b. Type II

c. Type III d. Type IV

5. Which of the following is not an error relating to measurement?

a. Error of accuracy. b. Error of precision

c. Systematic errors **d. Error of negligence**

CHAPTER 5

1. Which of the following is not a source of identity in rules?

a. Uncertainty due to negligence. b. Uncertainty due to conflict resolution

c. Uncertainty due to incompatibility of rules. d. Uncertainty related to individual rules

2. The …… engineer endeavours to minimize or eliminate uncertainty if possible.

a. Intelligent b. Wisdom

c. Knowledge d. Skilled

3. …….. refers to minimizing local uncertainties.

a. Verification b. Validation

c. Authenticity d. Appropriation

4. …… refers to minimizing global uncertainties of the entire system

a. Verification **b. Validation**

c. Authenticity d. Appropriation

5. Data fusion is **not** a cause of uncertainty

a. True **b. False**

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EXPERT SYSTEMS CSM 497

CHAPTER 1

1. The first step in solving any problem is defining the
   a. Expert system
   b. Inference engine
   c. Problem area or domain
   d. Views

2. Which of the following is not an area of artificial intelligence
   a. Speech
   b. Information systems
   c. Natural language
   d. Robotics

3. Expert systems is not a branch of AI
   a. True
   b. False

4. Which of the following is not an advantage of expert systems
   a. Increased availability
   b. Increased cost
   c. Increased reliability
   d. Fast response

5. Cognition is the study of how humans process information
   a. True
   b. False

CHAPTER 2

1. The study of knowledge is
    a. Epidural
    b. Epistemology
    c. Aristotle
    d. Knowledge representation

2. Knowledge can be classified into the following except
    a. Procedural
    b. Posteriori
    c. Tacit
    d. Declarative

3. A semantic network is a classic AI representation technique used for propositional information.
    a. True
    b. False

4. …….. is a way of representing knowledge
    a. Syllogism
    b. Semantics
    c. Knowledge domain
    d. Venn diagram

5. The connective ^ represents
    a. NOT
    b. OR
    c. AND
    d. IF…..THEN
    e.

CHAPTER 3

1. A hierarchical data structure consisting of nodes, which store information or knowledge and branches, which connect the nodes is known as what
   a. Vertex
   b. Leaves
   c. Tree
   d. Inference

2. A state is a collection of characteristics that can be used to define the status of an object
   a. **True**
   b. False

3. Which of the following is not a method of inference
   a. Law of attachment
   b. Law of Modus Tollens
   c. Law of contrapositive
   d. De Morgan's Law

4. A group of multiple inference that connects a problem with its solution is called a
   a. Preference
   b. Chain
   c. Unification
   d. Rules

5. Forward chaining is called not bottom-up reasoning
   a. True
   b. False

CHAPTER 4

1. Uncertainty is essentially lack of information to formulate a decision
   a. **True**
   b. False

2. Which of the following errors is related to measurement
   a. Error of inaccuracy
   b. Reliability
   c. **Error of precision**
   d. Random function

3. An expert system must not be designed to fit the real world.
   a. True
   b. False

4. When repeated trials give the exact same results, the system is
   a. Deterministic
   b. Non deterministic
   c. Compatible
   d. Non compatible

5. Bayes' Theorem is commonly used for decision tree analysis of business and social sciences
   a. True
   b. False

CHAPTER 5

1. …… refers to minimizing the local uncertainties.
    a. Validation
    b. **Verification**
    c. Resolution
    d. Subsumption

2. …….. refers to minimizing the global uncertainties of the entire expert system
    a. Validation
    b. Verification
    c. Resolution
    d. Subsumption

3. The Dempster-Shafer Theory is a method of inexact reasoning.
    a. True
    b. False

4. ……. is called a frame of discernment when its elements may be interpreted as possible answers and only one answer is correct.
    a. Environment
    b. Requirement
    c. Compatibility

5. Fuzzy logic is a superset of conventional logic – extended to handle partial truth
    a. True
    b. False

CHAPTER 1

1. A/an ……..is a computer system that emulates or acts in all respects with the decision making capabilities of a human expert.

a. Expert

System
b. Knowledge
System
c. Robotics
d. AI

2. The expert's knowledge about solving specific problems is called ……..

a. Knowledge
Domain
b. Solution
Domain
c. Research
Domain
d. Problem
Domain

3. ……. Is used in chemical mass spectroscopy to identify chemical constituents.

a. PROSPECTOR
b. MYCIN
c. DIPMETER
d. DENDRAL

4. ……. Is used in medical diagnosis of illness.

a. PROSPECTOR
b. MYCIN
c. DIPMETER
d. DENDRAL

5. ……. is used in geological data analysis for oil.

a. PROSPECTOR
b. MYCIN
c. DIPMETER
d. DENDRAL

CHAPTER 2

1. ……
is
the
study of making inferences given a set of facts
a. Wisdom
b. Logic
c. Semantics
d. Argument
2. ……
refers
to
the
meanings
we
give
to
symbols
a. Logic
b. Argument
c. Semantics
d. Inference
3. Expert
systems
are
designed
for
knowledge
representation
based
on
rules
of
logic
called
……
a. Logic

b. Semantics
c. Inferences
d. Arguments
4. An
……
refers
to
the
formal
way
facts
and
rules
of
inferences
are
used
to
reach
valid
conclusions.
a. Argument
b. Rules
c. Epistemology
d. Tacit
5. Which
of
the
following
is
not
a
category
of
epistemology?
a. Philosophy
b. Tacit
c. A
priori

d. Uncertainty

6. In expert systems, an …… is the metaknowledge that describes everything known about the problem domain.

a. Semantic net

b. ANS

c. Ontology

d. Conceptual graph

7. Semantic nets consists of …… and ……

a. Objects and Relationships

b. Propositions and Prepositions

c. Nodes and Arcs

d. Atoms and Chains
8. In PROLOG, a predicate expression consists of the ..... followed by zero or more ……. enclosed in ……. separated by commas.
a. Predicate name, Arguments, Parenthesis
b. Predicate name, Inferences, Parentheses
c. Expression header, Logical expressions, Parenthesis
d. Predicate name,

Logical
expression,
Parenthesis
9. The
OAV
triplet
can
be
used
to
characterize
all
the
knowledge
in
a
semantic
net.
OAV
stands
for?
a. Objective---Allocation---Valuation
b. Object---Allocation---Value
c. Objective---Attribute---Valuation
d. Object-- - Attribute-- - Value
10. In
propositional
logic,
a
statement
that
is
neither
a
tautology
nor
a
contradiction
is

called
a
……
a. Material
Implication
**b. Contingent
statement**
c. Biconditional
d. Open
sentences

CHAPTER 3

1. A
……
is
a
hierarchical
structure
consisting
of
nodes
and
branches.
a. Linked
list
b. Struct
c. Tree
d. Net
2. What
type
of
tree
has
only
a
single
pathway
from

the
root
to
its
one
leaf?
a. Binary
tree
b. Degenerate
tree
c. Lean
tree
d. Atomic
tree
3. A
……
is
a
diagram
describing
the
finite
number
of
states
of
a
machine.
a. ANS
b. DNS
c. FSM
d. FGM
4. In
the
types
of
Logic,
Intuition
is

explained as ……
a. No proven theory
b. Rules of thumb based on experience
c. Trial and error
d. Reasoning where conclusions must follow from premises
5. In the types of Logic, Heuristics is explained as ……
a. No proven theory
b. Rules of thumb based

on
experience
c. Trial
and
error
d. Reasoning
where
conclusions
must
follow
from
premises
6. Default
is
also
explained
as
……..
a. Self---knowledge.
b. Reasoning
back
from
a
true
condition
to
the
premises
that
may
have
caused
the
condition.
c. Inferring
conclusions
based
on
similarities

with other situations

d. Absence of specific knowledge

7. Which of the following is not a requirement of a Formal System

a. An alphabet of symbols

b. Completeness

c. Axioms

d. Accurate Semantics

8. What does Wffs stand for in Expert Systems?

a. Well formulated formulas

b. Well

founded
facts
c. Well
formulated
facts
d. Well
founded
formulas
9. A
……
is
a
group
of
multiple
inferences
that
connect
a
problem
with
its
solution.
a. Connect
b. Chain
c. Inference
net
d. Hypothesis
10. Which
of
the
following
is
not
a
type
of
logic?
a. Nonmonotonic

b. Autoepistemic
c. Generate
and
Test
d. Trial
and
Error

CHAPTER 4

1. Logic
system
provides
an
advantage
when
dealing
with
a. Logic
b. Uncertainty
c. Humans
d. Semantic
nets

2. Which
of
the
following
deals
with
exact
facts
and
exact
conclusion
a. Inductive
reasoning
b. Uncertainty
c. Logic
d. **Deductive**
reasoning

3. Accepting a hypothesis when it is not true is
a. False positive
b. False negative
c. Semantic nets
d. Inductive reasoning
4. Inductive reasoning
a. Deals with exact facts and exact conclusion
b. Support the conclusion but do not guarantee it
c. A form of declarative knowledge

d. Using knowledge in beneficial way

5. Rejecting a hypothesis when it is true is

a. False positive

b. False negative

c. Semantic nets

d. Inductive reasoning

6. When repeated trials give the exact same result, the system is

a. Unreliable

b. Deductive

c. Deterministic

d. Inaccurate

7. How well the

truth
is
known
is
a. Error
of
accuracy
b. Unreliability
c. Error
of
precision
d. Inductive
reasoning
8. Random
fluctuations
are
also
termed
as
a. Systematic
errors
b. Random
error
c. False
negative
d. Error
of
precision
9. Compound
probabilities
can
be
expressed
by
a. P(A ∩ B)
=
n(A ∩ B)
/
n(s)

b. LS
=
P(E|H)
/
P(E|H)
c. P(H|e)
d. Ln
=
p(E'|H)
/
P(E'|H')
10. Which
type
of
belief
is
false
a. Possible
b. Probable
c. Impossible
d. Plausible

CHAPTER 5

1. Two
of
the
following
are
not
sources
of
uncertainty
that
expert
systems
operate
in
i. Conflict

resolution
ii. Knowledge
base
iii. Individual
views
iv. Incompatibility
of
rules
a. i
and
ii
b. ii
and
iii
c. iii
and
iv
d. i
and
iii
Answer
b
2. The
certainty
factor,
CF,
is
way
of
combining
_____
and
_____
into
a
single
number.
a. Belief
and

truth
b. Disbelief and falsehood
c. Belief and disbelief
d. Truth and falsehood
Answer **c**
3. The certainty factor can be used to rank _____ in order of importance.
a. Truth
b. Belief
c. Evidence
d. Hypothesis
Answer **d**
4. In MYCIN, suppose another rule also concludes the

same hypothesis, but with a different certainty factor, the certainty factor of rules concluding the same hypothesis are calculated from the _____.

a. Certainty function
b. Reduction function
c. Combining function
d. Attenuation function

Answer
c

5. A theory that attempts to model uncertainty

by
a
range
of
probabilities
rather
a
single
probabilistic
number
is
a. Dempster---Shafer
b. Propagation
of
Probabilities
c. Approximate
Reasoning
d. Inference
Nets
Answer
a
6. Evidential
reasoning
deals
with
information
that
is
expected
to
be
a. uncertain,
imprecise
and
occasionally
inaccurate.
b. certain,
precise
and

always
accurate
c. imprecise
and
occasionally
accurate
d. certain,
precise
and
occasionally
inaccurate.
Answer
a
7. Computing
not
based
on
classical
two
–valued
logics
which
includes
fuzzy
logic,
neural
networks
and
probabilistic
reasoning
is
known
as
a. Approximate
Logic
b. Soft
Computing
c. Hard
computing

d. Extended computing
Answer
b
8. Which principle defines how to extend the domain of a given crisp set function to include fuzzy sets.
a. Approximate principle
b. Extended principle
c. Fuzzy set principle
d. Crisp set principle
Answer
b
9. Translation rules specify how modified

or
composite
propositions
are
generated
from
their
elementary
propositions.
The
correct
order
for
category
of
rules
are
I. Modification
rules
II. Quantification
rules
III. Composition
rules
IV. Qualification
rules
a. I,
III,
II
and
IV
b. I,
II,
III
and
IV
c. IV,
I,
II,
and

III
d. II,
III,
I,
IV
Answer
a
10. Conditional,
conjunctive,
disjunctive
fall
under
which
category
of
translation
rules.
a. Modification
rules
b. Quantification
rules
c. Composition
rules
d. Qualification
rules
Answer
c

CHAPTER 6

1. Designing
of
expert
systems
of
part
of
a
general

field
is
known
as
a. Knowledge
Management
b. Product
Management
c. Project
Management
d. Resource
Management
Answer
a
2. Expert
systems
payoff
may
include
two
of
the
following
i. Increased
possibility
ii. Increased
probability
iii. Increased
efficiency
iv. Money
a. i
and
ii
b. ii
and
iii
c. iii
and
iv

d. i
and
iii
Answer
c
3. The
major
sub
management
levels
under
project
management
are
a. Activity
Management,
Product
Management,
Change
Management
b. Product
Configuration
Management,
Resource
Management,
Change
Management
c. Product
Management,
Resource
Management,
Activity
Management
d. Activity
Management,
Product
Configuration
Management,
Resource

Management
Answer
d
4. The
general
stages
in
the
development
of
an
expert
system
starts
at
the
Feasibility
study
and
ends
with
Maintenance
and
evolution.
The
middle
stages
are
i. Commercial
quality
system
ii. Rapid
Prototype
iii. Field
Testable
iv. Refined
System
a. i,
ii,

iii
and
iv
b. ii,
iv,
iii
and
i
c. iii,
i,
iv
and
ii
d. iv,
ii,
iii,
i
Answer
b
5. Major
errors
in
expert
systems
may
arise
from
knowledge
base,
knowledge
engineer,
inference
engine
and
a. Inference
chain
and
expert
b. Expert

and inference view
c. Inference chain and knowledge
d. Inference view and knowledge
Answer **a**
6. A difficult term to describe in a general sense because it means different things to different people is _____.
a. quantity
b. quality
c. metrics
d. cost
Answer **b**
7. Factors

to
be
considered
in
the
design
of
expert
systems
include
problem
selection,
a. cut
backs
and
money
b. cost
and
product
assurance
c. payoff
and
expert
knowledge
d. cost
payoff
Answer
d
8. Another
term
for
life
cycle
is
_____,
because
it
is
concerned

with
the
two
fundamental
issues
of
software
development.
a. Life
development
b. Software
process
c. Process
model
d. Process
evolution
Answer
c
9. The
knowledge
definition
stage
consists
of
two
main
tasks
one
of
which
is
a. Knowledge
source
identification
and
analysis
b. Knowledge
acquisition
and

selection
c. Knowledge acquisition, analysis and extraction
d. Knowledge source identification, analysis and extraction
Answer
c
10. The objective of the knowledge verification stage is to determine the _____, _____ and _____.
a. Correctness, formal tests, test analysis
b. Correctness, completeness and consistency
c. Completeness,

test
analysis
and
consistency
d. Consistency,
test
analysis
and
formal
tests.
Answer
b

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EXPERT SYSTEMS CSM 497

CHAPTER ONE: INTRTODUCTION TO EXPERT SYSTEMS

1. An expert's knowledge which is specific to a particular area is referred to as….
   A) Knowledge Domain
   B) Specific domain
   C) Problem Domain
   D) None of the above
2. The expert's knowledge about solving a specific problem is called…
   A) Specific knowledge
   B) Problem solving knowledge
   C) Problem domain
   D) **Knowledge Domain**
3. Mention 3 advantages of expert system
   i) Increased Availability
   ii) Reduced danger
   iii) Increased reliability
4. Expert system languages are…… generation
   A) Post-first
   B) Post fourth
   C) **Post-third**
   D) None
5. Knowledge base is also called
   Answer: Production Memory

CHAPTER TWO: THE REPRESENTATION OF KNOWLEDGE

1. …….. is the study of making inferences
   A) **Logic**
   B) Algorithm
   C) Reasoning
   D) None
2. ……. Refers to the meanings we give to symbols
   A) Symbolism
   B) **Semantics**
   C) Both a and b
   D) None
3. …… refers to the formal way facts and rules of inferences are used to reach valid conclusions.
   A) Facts
   B) **Argument**
   C) Logical reasoning
   D) All of the above
4. …….. is the formal study of knowledge
   A) **Epistemology**
   B) Entomology
   C) Logic
   D) None
5. ….. are the end-product of inferences when done according to formal rules.
   A) Final
   B) **Conclusions**
   C) Both
   D) None

CHAPTER THREE: METHODS OF INFERENCE

1. …. Is a hierarchical structure consisting of nodes and branches
   A) **Tree**
   B) Graph
   C) Root
   D) None
2. ……. Restricts the number of nodes per children to a maximum of two
   A) Degenerate tree
   B) **Binary tree**
   C) Complete tree
   D) All
3. ……. Trees have only a single pathway from root to its one leaf.
   A) **Degenerate**
   B) Binary

C) Partial
D) None of the above

4. ….. graphs have no loops.
   A) Binary
   B) Directed
   C) Multigraph
   D) **Simple**
5. ….. is a directed acyclic graph.
   A) **Lattice**
   B) Diagraphs
   C) Connected graph
   D) All of the above

CHAPTER FOUR: REASONING UNDER UNCERTAINTY

1. ….. is lack of information to formulate a decision
   A) **Uncertainty**
   B) Certainty
   C) Confusion
   D) All of the above
2. ….. reasoning deals with exact facts and exact conclusions.
   A) **Deductive**
   B) Inductive
   C) Both a and b
   D) None of the above
3. ……. Accepting a hypothesis when it is not true.
   A) Type II error
   B) **Type I error**
   C) Unreliability
   D) All of the above
4. When rules are based on heuristics there will be……
   A) **Uncertainty**
   B) Unreliability
   C) Type II error
   D) Type I error
5. ….. defines the probability of an event, as the limit of a frequency distribution.
   A) subjective probability
   B) **experimental probability**
   C) compound probability
   D) None

CHAPTER FIVE: INEXACT REASONING

1. ….. Is concerned with the correctness of the system's building blocks.
   A) **Verification**

B) Authentication
C) Validation
D) All of the above

2. …… refers to minimizing the global uncertainties of the entire system
   A) Authentication
   B) **Validation**
   C) Verification
   D) None
3. ……. Logic is a superset of conventional logic
   A) **Fuzzy**
   B) Approximate
4. Fuzzy logic is an extension of…..logic
   A) Fuzzy
   B) Approximate
   C) **Multivalued**
   D) None
5. There are two types mountains, name them
   A) Logic
   B) Uncertainty

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EXPERT SYSTEMS ASSIGNMENT

CHAPTER 1

1. …….. is used in geological data analysis for oil.
   a. PROSPECTOR
   b. MYCIN
   c. DIPMETER

d. DENDRAL

2. . ……. is used in geological analysis for minerals.
   a. PROSPECTOR
   b. MYCIN
   c. DIPMETER
   d. DENDRAL

3. …….. is used in configuring computer systems.
   a. PROSPECTOR
   b. MYCIN
   c. DIPMETER
   d. XCON/RI

4. …….. Is a prioritized list of rules created by the inference engine, whose patterns are satisfied by facts or objects in working memory?
   a. Agenda
   b. Algorithm
   c. Knowledge Acquisition Facility
   d. Propaganda

5. ……. refers to reasoning in reverse from a hypothesis, a potential conclusion to be proved to the facts that support the hypothesis - best for diagnosis problems.
   a. Forward chaining
   b. Middle chaining
   c. backward chaining
   d. Basic idea

CHAPTER 2

1. In expert systems, an ……. is the metaknowledge that describes everything known about the problem domain.
   a. Semantic net
   b. ANS

c. Ontology
d. Conceptual graph

2. Semantic nets consists of ……. and …….
   a. Objects and Relationships
   b. Propositions and Prepositions
   c. Nodes and Arcs
   d. Atoms and Chains

3. In PROLOG, a predicate expression consists of the ..... followed by zero or more ……. enclosed in ……. separated by commas.
   a. Predicate name, Arguments, Parenthesis
   b. Predicate name, Inferences, Parentheses
   c. Expression header, Logical expressions, Parenthesis
   d. Predicate name, Logical expression, Parenthesis

4. The OAV triplet can be used to characterize all the knowledge in a semantic net. OAV stands for?
   a. Objective-Allocation-Valuation
   b. Object-Allocation-Value
   c. Objective-Attribute-Valuation
   d. Object-Attribute-Value

5. In propositional logic, a statement that is neither a tautology nor a contradiction is called a …….
   a. Material Implication
   b. Contingent statement
   c. Biconditional
   d. Open sentences

CHAPTER 3

1. Default is also explained as …….
   a. Self-knowledge.
   b. Reasoning back from a true condition to the premises that may have caused the condition.
   c. Inferring conclusions based on similarities with other situations

d. Absence of specific knowledge

2. Which of the following is not a requirement of a Formal System
   a. An alphabet of symbols
   b. Completeness
   c. Axioms
   d. Accurate Semantics

3. What does Wffs stand for in Expert Systems?
   a. Well formulated formulas
   b. Well founded facts
   c. Well formulated facts
   d. Well founded formulas

4. A …… is a group of multiple inferences that connect a problem with its solution.
   a. Connect
   b. Chain
   c. Inference net
   d. Hypothesis

5. Which of the following is not a type of logic?
   a. Nonmonotonic
   b. Autoepistemic
   c. Generate and Test
   d. Trial and Error

CHAPTER 4

1. When repeated trials give the exact same result, the system is
   a. Unreliable
   b. Deductive
   c. Deterministic

d. Inaccurate

2. How well the truth is known is
   a. Error of accuracy
   b. Unreliability
   c. Error of precision
   d. Inductive reasoning

3. Random fluctuations are also termed as
   a. Systematic errors
   b. Random error
   c. False negative
   d. Error of precision

4. Compound probabilities can be expressed by
   a. $P(A \cap B) = n(A \cap B) / n(s)$
   b. LS = P(E|H) / P(E|H)
   c. P(H|e)
   d. Ln = p(E'|H) / P(E'|H')

5. Which type of belief is false
   a. Possible
   b. Probable
   c. Impossible
   d. Plausible

CHAPTER 5

1. Evidential reasoning deals with information that is expected to be
   a. uncertain, imprecise and occasionally inaccurate.
   b. certain, precise and always accurate
   c. imprecise and occasionally accurate
   d. certain, precise and occasionally inaccurate.
   Answer a

2. Computing not based on classical two –valued logics which includes fuzzy logic, neural networks and probabilistic reasoning is known as
   a. Approximate Logic
   b. Soft Computing
   c. Hard computing
   d. Extended computing
   Answer b

3. Which principle defines how to extend the domain of a given crisp set function to include fuzzy sets?
   a. Approximate principle
   b. Extended principle
   c. Fuzzy set principle
   d. Crisp set principle
   Answer b

4. Translation rules specify how modified or composite propositions are generated from their elementary propositions. The correct order for category of rules are
   I. Modification rules
   II. Quantification rules
   III. Composition rules
   IV. Qualification rules
   a. I, III, II and IV
   b. I, II, III and IV
   c. IV, I, II, and III
   d. II, III, I, IV
   Answer a

5. Conditional, conjunctive, disjunctive fall under which category of translation rules.
   a. Modification rules
   b. Quantification rules
   c. Composition rules
   d. Qualification rules
   Answer c

CSM 497(EXPERT SYSTEMS) MCQS ASSIGNMENT

NAME : EDINAM YAO AHADZIE

INDEX NO: 4701015

1. Which of the following is an advantage of using an expert system development tool?
   a. Imposed structure
   b. Knowledge engineering assistance
   c. Rapid prototyping
   d. All the above

2. The first widely-used commercial form of artificial intelligence is being used in many popular products like microwave ovens, automobiles and plug in circuit boards for desktop PCs. It allows machines to handle vague information with a deftness that mimics human intuition. What is the name of this artificial intelligence?
   a. Boolean logic
   b. Human logic
   c. Fuzzy logic
   d. Functional logic

3. An expert system is
   a. A computer that can answer questions like a human expert.
   b. A group of scientists who design computer programs.
   c. A method of producing new words.
   d. A computer that can feel emotions.

4. Expert system is an area in AI?
   a. True
   b. False

5. What language is used in expert systems?
   a. Java
   b. Visual basic
   c. CLIPS
   d. Python

6. Expert systems consist of …….. main components.
   a. 2
   b. 3
   c. 4
   d. 5

7. …… Is obtainable from books, magazines, knowledgeable persons, etc.
   a. Inference engine
   b. Problem domain
   c. Knowledge domain
   d. Knowledge base

8. …….. draws conclusion from knowledge base.
   a. Inference engine
   b. Problem domain
   c. Knowledge domain
   d. Knowledge base

9. The expert's knowledge about solving specific problems is called?
   a. Inference engine
   b. Problem domain
   c. Knowledge domain
   d. Knowledge base

10. The problem domain is always a superset of the knowledge domain.
    a. True
    b. False

11. What is logic?
    a. Process of reasoning
    b. Process of thinking
    c. Study of making inferences
    d. Process of making good decisions

12. Formal logic is a more rigorous approach to proving a conclusion to be true or false.
    a. True
    b. False

13. Semantics refers to meanings we give to words.
    a. True
    b. False

14. All the following are goals of expert systems except?
    a. We need to be able to separate actual meanings of words with the reasoning process itself
    b. We need to make inferences without relying on semantics
    c. We need to teach machines how to reason correctly
    d. We need to reach valid conclusions based on facts only

15. Expert systems are designed for knowledge representation based on rules of logic called……

a. Semantics
b. Logic
c. Inferences
d. Reasoning

16. Arguments refers to the formal way facts and rules are used to reach valid conclusions.
    a. True
    b. False

17. The process of reaching valid conclusions is referred to as ……
    a. Logical reasoning
    b. Heuristics
    c. Precedents handling
    d. Declarative knowledge

18. Epistemology is the formal study knowledge.
    a. True
    b. False

19. Expert systems reason while humans infer.
    a. True
    b. False

20. How many categories are in epistemology?
    a. 5
    b. 6
    c. 7
    d. 8

21. A tree is a hierarchical structure consisting of …… and ……..
    i. Nodes
    ii. Branches
    iii. Lines
    iv. Links

    a. I and III
    b. II and III
    c. I and II
    d. III and IV

22. Which node is referred to as the root node and occupies the highest hierarchy?
    a. Bottom node
    b. Top node
    c. End node

d. Last node

23. The nodes at the bottom of a tree are referred to as
    a. Top node
    b. End node
    c. Last node
    d. Leaves

24. The root node of a tree has exactly one parent.
    a. True
    b. False

25. Every node may give rise to zero or more child nodes.
    a. True
    b. False

26. A binary tree restricts the number of children per node to a maximum of 2.
    a. True
    b. False

27. Degenerate trees do not have only a single pathway from root to its one leaf.
    a. True
    b. False

28. Graphs are sometimes called a …….. or net
    a. Directed trees
    b. Multiple trees
    c. Network
    d. Links

29. A …….. Is a path through the graph beginning and ending at the same node.
    a. Links
    b. Circle
    c. Circuit
    d. Loop

30. Lattice is an undirected acyclic graph.
    a. True
    b. False

31. Lack of information to formulate a decision is termed as?
    a. Unreliability
    b. Uncertainty
    c. A and B

d. None of the above

32. Uncertainty may result in one of the following
    a. Making poor or bad decision
    b. Making information available
    c. Making information unreliable
    d. Making information irrelevant

33. Deductive reasoning deals with
    a. Premises supporting the conclusion
    b. Exact facts and exact conclusions
    c. A and B
    d. None of the above

34. When repeated trials in a system give the exact same results, the system is termed as
    a. Unrealistic
    b. Nondeterministic
    c. Deterministic
    d. Ambiguous

35. …… probability defines the probability of an event, as the limit of a frequency distribution.
    a. Subjective
    b. Experimental
    c. Classic
    d. Theoretical

36. ……. probability deals with events that are not reproducible and have no historical basis on which to extrapolate.
    a. Subjective
    b. Experimental
    c. Classic
    d. Theoretical

37. …… events are events that do not affect each other.
    a. Reliable
    b. Independent
    c. Simple
    d. Compound

38. The probability of an event A occurring, given that event B has already occurred is called
    a. Theoretical probability
    b. Classic probability
    c. Subjective probability

d. Conditional probability

39. Dijkstra's algorithm is an approach to dealing with uncertainty.
    a. True
    b. False

40. Shannon theory is an approach to dealing with uncertainty.
    a. True
    b. False

41. …… is concerned with the correctness of the system's building blocks.
    a. Authentication
    b. Verification
    c. Authorization
    d. validation

42. …….. refers to minimizing the global uncertainties of the entire system.
    a. Authentication
    b. Verification
    c. Authorization
    d. Validation

43. The certainty factor is a way of combining belief and disbelief into a single number.
    a. True
    b. False

44. In MYCIN, a rule's antecedent certainty factor must be less than 0.2 for the antecedent to be considered true and activate the rule.
    a. True
    b. False

45. What is an environment is called when its elements may be interpreted as possible answers and only one answer is correct?
    a. Knowledge base
    b. Inference engine
    c. A frame of discernment
    d. Mutually exclusive

46. Dempster's rule combines …… to produce a new mass that represents the consensus of the original, possibly conflicting evidence.
    a. Theorems
    b. Mass
    c. Probabilities
    d. None of the above.

47. The lower bound is called ……
    a. Support
    b. Plausibility
    c. Belief measure
    d. None of the above

48. The upper bound is called ……
    a. Support
    b. Plausibility
    c. Belief measure
    d. None of the above

49. …… is theory of uncertainty based on fuzzy logic and concerned with qualifying and reasoning using natural language where words have ambiguous meaning.
    a. Complete reasoning
    b. Approximate reasoning
    c. Partial reasoning
    d. None of the above

50. Fuzzy logic is a subset of conventional logic extended to handle partial truth.
    a. True
    b. False

51. Building an expert system, what do we take in consideration?
    a. Why are we building the system?
    b. What tools will be available to build the system?
    c. How much will the system cost?
    d. All the above

52. How many stages are involved in building an expert system?
    a. 3
    b. 4
    c. 5
    d. 6

53. At what stage do knowledge engineers do verification?
    A. Feasibility study
    B. Rapid prototype
    C. Refined system
    D. Field testable

54. At which stage do you demonstrate ideas?
    a. Feasibility study

b. Rapid prototyping
c. Refined system
d. Field testable

55. In the waterfall model, each stage ends with …… and …… activity to minimize any problems in that stage.
    i. Authentication
    ii. Verification
    iii. Validation
    iv. Authorization

    a. I and IV
    b. I and II
    c. II and III
    d. II and IV

56. In the waterfall model, arrows go back and forth only one stage at a time.
    a. True
    b. False

57. What model led to the do-it-twice concept where a prototype then a final system was built?
    a. Waterfall model
    b. Code-and-fix model
    c. Incremental model
    d. Spiral model

58. Which model is a refinement of the waterfall model and top-down-approach?
    a. Spiral model
    b. Code-and-fix model
    c. Incremental model
    d. None of the above

59. Expert systems may have serious responsibilities.
    a. True
    b. False

60. At which stage in the development stages of expert systems are bugs repaired to enhance capabilities?
    a. Rapid prototyping
    b. Feasibility study
    c. Field testability
    d. Maintenance and evolution

CHAPTER 176

Chapter 1

1. All of these are areas of Artificial Intelligence except
   a. Robotics
   b. Principles
   c. Vision
   d. Speech
2. The inference engine draws conclusions from knowledge base
   a. True
   b. False
   c. Cannot be determined
3. Which of these is an advantage of Expert Systems
   a. Increased cost
   b. Reduced availability
   c. Increased reliability
   d. Increased danger
4. Reasoning in reverse from a hypothesis, a potential conclusion to be proved to the facts that support the hypothesis refers to which method of inferencing?
   a. Forward chaining
   b. Backward chaining
   c. Back to back chaining
   d. None of the above
5. Expert systems solve problems for which there are no known algorithms.
   a. False
   b. Not true
   c. True
   d. Can't be determined

Chapter 2

The Representation of Knowledge

1) ……is the study of making inferences ,given a set of facts
   a. Wisdom
   b. Knowledge
   c. Logic
   d. Education
2) which is not a goal of expert systems
   a. making inferences without relying on semantics
   b. reaching valid conclusions
   c. separating the actual meanings with reasoning process
   d. trying to achieve everything with expert systems
3) what is the relationship between knowledge and expert systems
   a. logic
   b. Inference

c. Knowledge
d. System

4)……. is the formal study of knowledge

a. Epistemology

b. **Philosophy**

c. Declarative

d. Procedural

5) Expert systems Infer as Humans……

a. Jump into conclusion

b. Use assumptions

c. **Reason**

d. Infer

Chapter 3

1. Which of these is odd
   a. Node
   b. Branch
   c. Leaf
   d. Sector
2. All of these are examples of Simple graphs except
   a. Connected graph
   b. Non-connected graph
   c. trigraph
   d. Lattice
3. Decision Trees can be self-learning
   a. True
   b. False
   c. Can't be determined
4. Syllogism has two premises and one conclusion
   a. True
   b. False
   c. Can't be determined
5. List Four Types of Logic

Chapter 4

1. Uncertainty is essentially lack of information to formulate a decision.
   a. True
   b. False
   c. Can't be determined

2. _____ deals with the exact facts and exact conclusions.
   a. Inductive Reasoning
   b. Deductive Reasoning
   c. Exclusive Reasoning
   d. Inclusive Reasoning
3. _____ premises support conclusion but do not guarantee it.
   a. Inductive Reasoning
   b. Deductive Reasoning
   c. Exclusive Reasoning
   d. Inclusive Reasoning

4. _____ defines the probability of an event, as the limit of a frequency distribution.
   a. Experimental Probability
   b. Subjective Probability
   c. Objective Probability
   d. None of the Above

5. _____ deals with events that are not reproducible and have no historical basis on which to extrapolate
   a. Experimental Probability
   b. Subjective Probability
   c. Objective Probability
   d. None of the Above

Chapter 5

1. Verification refers to minimizing the local uncertainties of an expert system
   a. True
   b. False
   c. Can't be determined
2. Validation refers to minimizing the local uncertainties of an expert system
   a. True
   b. False
   c. Can't be determined
3. The Dempster-Shafer Theory is a method of uncertainty in expert systems
   a. False

   b. True
   c. None of the above
   d. Can't be determined

4. Certainty factors are simple to implement where inference chains are short
   a. True
   b. Not True
   c. False
   d. Two of the above
5. List four applications of Fuzzy Theory

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Expert Systems

1. In an expert system, the expertise is contained in a:
A. Database
B. Model base
C. Knowledge base
D. All of the above

2. In an expert system, the process of matching a question to the information in the knowledge base is:
A. Deduction
B. Inference
C. Inclusion
D. All of the above

3. What is the name of the computer program that simulates the thought processes of human beings
A. Human Logic
B. Expert reason
C. Expert system

4. The field that investigates the mechanics of human intelligence is
A. History
B. Cognitive science
C. Sociology

D. Psychology

5. What is the name of the computer program that contains the distilled knowledge of an expert?

A. DBMS
B. MIS
C. Expert System
D. Artificial Intelligence

CHAPTER TWO

6. PROLOG is an AI programming language which solves problems with a form of symbolic logic known as predicate calculus. It was developed in 1972 at the University of Marseilles by a team of specialists. Can you name the person who headed this team?

A. Alain Colmerauer
B. Nicklaus Wirth
C. Seymour Papert
D. John McCarthy

7. Which of the following propositions is tautology?

A. (p v q)→q
B. p v (q→p)
C. p v (p→q)

D. Both (b) & (c)

8. $P \rightarrow (Q \rightarrow R)$ is equivalent to
A. $(P \wedge Q) \rightarrow R$
B. $(P \wedge Q) \rightarrow R$
C. $(P \vee Q) \rightarrow R$
D. $(P \vee Q) \rightarrow \neg R$

9. In propositional logic , which of the following is equivalent to $p \rightarrow q$?
A. $\sim p \rightarrow q$
B. $\sim p \vee q$
C. $\sim p \vee \sim q$
D. $p \rightarrow q$

10. Logic gate in which any one of inputs is logic 1 results in output as logic 1 is termed as

A. NOT gate
B. NOR gate
C. AND gate
D. OR gate

CHAPTER THREE

11. Electronic digital circuits are also called as

A. Switching algebra
B. Logic circuits
C. Binary circuits
D. Binary algebra

12. Which of following gate is represented by x+y=z?

A. NOR gate
B. OR gate
C. NOT gate
D. XOR gate

13. Using 10's complement subtracting 3250 from 72532 is equal to

A. 69282
B. 69272
C. 69252
D. 69232

14. Electric digital systems uses signals that have 2 distinct values and circuit elements having

A. One stable state
B. Two stable states
C. Three stable states
D. Four stable states

15. Discrete elements of information are represented in a digital systems as

A. signals
B. Vectors
C. Matrix
D. Array

CHAPTER FIVE

1. Statements given in support of another statement are called.

A. Conclusion
B. Premises
C. Arguments
D. Summaries

2. The statement that premises are intended to support is called.
A. A related premise
B. An argument
C. A description
D. The conclusion

3. The process of reasoning from a premise or premises to a conclusion based on those premises is known as.

A. Extended reasoning
B. Subordinate premise
C. Dialectic
D. Inference

4. Words that frequently accompany arguments and signal that a premise or conclusion is present is called.

A. Inference words
B. Premise indicators
C. Indicator words
D. Equivalent words

5. A word that is not a premise indicator word is.

A. Therefore
B. As
C. Since
D. For

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Expert Systems Questions

Chapter 1

1. An expert system is a computer system that emulates, or acts in all respects, with the decision-making capabilities of a human expert.
   Ans: True/False
2. Artificial intelligence is limited to just robotics.
   Ans: True/**False**
3. Expert Systems contain two main components, which are knowledge base and _____?
   Ans: Inference engine.

4. The problem domain is always a superset of the knowledge domain.
   Ans: True/False
5. Expert Systems are suited for all applications.
   Ans: True/**False**

Chapter 2

1. Logic is the study of making conclusion – given a set of facts, we attempt to reach a true inferences.
   Ans: True/**False**
2. An argument refers to the formal way facts and rules of inferences are used to reach valid conclusions.
   Ans: True/False.
3. _____ is the formal study of knowledge,
   Ans: Epistemology.
4. Which of these is found at the topmost of part of the knowledge pyramid.
   i. **Wisdom.**
   ii. Noise.
   iii. Information
   iv. Data
5. Which of these is found buttom of the knowledge pyramid.
   I. Wisdom.
   ii. Noise.
   iii. Information
   iv. Data

Chapter 3

1. A graph with no cycles is referred to as……
   a) Digraph
   b) Acyclic
   c) Lattice
2. Graphs are sometimes called a…….
   a) network
   b) system
   c) circuit
3. A……is a path through the graph beginning and ending with the same node.
   a) Acyclic
   b) Circuit
   c) circle

4. What does FSM stand for?

   a) Finite State Machine

   b) Finite State Manipulation

   c) Finite Specific Machine

5. A…….can be used to define an object's behavior.

   a) Problem Space

   b) State Space

   c) Direct Space

Chapter 4

1. The essential lack of information to formulate a decision is referred to as…….
   a) Uncertainty
   b) Subjectivity
   c) Reasonability
   d) Objectivity

2. The following are theories to deal with uncertainty except……
   a) Bayesian Probability
   b) Markov's Model
   c) Hartley Theory
   d) Maslow's theory
3. ……. defines the probability of an event, as the limit of a frequency distribution
   a) Experimental probability
   b) Deductive Probability
   c) Subjective probability
   d) Conventional probability

4. ……is commonly used for decision tree analysis of business and social sciences.
   a) Babe's Theorem
   b) Marlow's Theory
   c) Bayes' Theorem
   d) Markov's Model

5. ……..deals with exact facts and exact conclusions.

a) Inductive reasoning
b) Deductive reasoning
c) Informative reasoning
d) Sarcastic Reasoning

Chapter 5

1. The knowledge engineer endeavors to minimize, or eliminate, uncertainty if possible
   a) True
   b) False

2. Verification refers to minimizing the local uncertainties.
   a) True
   b) False

3. Validation refers to maximizing the global uncertainties of the entire expert system.
   a) True
   b) False

4. When a fact is entered in the working memory, it receives a unique timetag – indicating when it was entered.
   a) True
   b) False

5. The Dempster-Shafer Theory is a method of exact reasoning.
   a) True
   b) False

Expert Systems assignment.

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Chapter 1

CHAPTER 187

1.Another way of defining An Expert system, is the ability of emulating the decision-making ability of a/an

a. Professional

b. Intellectual

c. Human Expert

d. Communication professional

2. Natural Language is considered as an area in Artificial Intelligence, which other amongst the following can also be considered as an area in Artificial Intelligence?

a. Education

b. Entrepreneurship

c. Expert systems

d. Building Technology

3.Which of the following is considered a component of an Expert system?

a. intellectual engine

b. Factual knowledge

c. strategical planning

d. Knowledge base

4. The expert system's knowledge about solving a specific problem is called the……

a. Domain

b. Problem Domain

c. Inference Knowledge

d. Knowledge Domain

5.Forward and Backward chaining are general methods of ……..

a. chaining

b. referencing

c. inferencing

CHAPTER 188

d. reasoning

Chapter 2

Representation of knowledge.

1. The study of making inferences – given a set of facts, and attempting to reach a true conclusion is referred to as…….
   a. Principles
   b. Case study
   c. Logic
   d. Inference

2. Expert systems are designed for knowledge representation based on rules of logic called …….
   a. Inferences
   b. Databases
   c. Groupings
   d. Semantics

3. The process of reaching valid conclusions is referred to as ……
   a. Validation
   b. Logical reasoning
   c. Knowledge assessment
   d. Logistical analysis

4. Heuristics refers to ……
   a. Using systematic approach in solving problems
   b. Applying intelligence in decision making
   c. Seeking knowledge by inferring
   d. Using experience to solve problems

5. Epistemology is the formal study of ……..
   a. Nature
   b. Society
   c. Knowledge
   d. Problems

CHAPTER 189

Chapter 3

Method of Inference

1. The tree is a hierarchical data structure consisting of Nodes and Branches. The purpose of the Nodes is for
   a. Connecting the branches
   b. Raising the height of the tree
   c. For storing information
   d. Make the tree firm

2. Graphs have …… or more links between parents and child
   a. 3
   b. 2
   c. 1
   d. 0

3. …….. is a path through the graph beginning and ending with the same node.
   a. Cylinder
   b. Circuit
   c. Circles
   d. Circus

4. Graphs which have links to all the nodes are referred to as …..
   a. Lattice graphs
   b. Cyclical graphs
   c. Digraphs graphs
   d. Connected graphs

5. Digraphs are graphs with …….links
   a. No
   b. Unending
   c. Directed
   d. Missing

Chapter four

Reasonings under uncertainty

CHAPTER 190

1. The following are theories to deal with uncertainty except,
   a. Zadeh's Fuzzy theory
   b. Markov Models
   c. Dempster-Shafer theory
   d. Shalom Theory

2. Which of the following deals with exact facts and exact conclusions?
   a. Inference reasoning
   b. Abductive reasoning
   c. Deductive reasoning
   d. Inductive reasoning

3. Error of precision doesn't tell how well the truth is known. True/False
4. The following are associated with errors related to measurement except
   a. Random fluctuations
   b. Unreliability
   c. Inflation
   d. Systematic Errors

5. Bayes' Theorem is the inverse of conditional probability. True / False

Chapter 5

Inexact Reasoning

1. Sources of uncertainty in rules include
   a. Uncertainty due to compatibility of rules
   b. Uncertainty due to conflict of resolution
   c. Uncertainty related to mass rules
   d. Uncertainty due to unnecessary reasoning

2. The process of minimizing of local uncertainty refers to …….
   a. Validation
   b. Verification
   c. Alienation
   d. Minimization

CHAPTER 191

3. The process of minimizing the global uncertainty of the entire expert system is referred to as ……..
   a. Validation
   b. Verification
   c. Alienation
   d. Minimization

4. Dempster-Shafer theory is a method of inexact reasoning. True/FALSE

5. Fuzzy logic is a subset of conventional logic. True / False.

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CHAPTER 1

1. Weak AI is based on:
   a. Generic Algorithms
   b. Natural Neural Networks
   c. **Artificial Neural Networks**
   d. Inference Engine
2. A system that has the ability to emulate decision making ability of an expert is a. Expert
   b. Artificial Intelligence
   c. Inference Engine
   d. **Expert System**
3. An expert's knowledge about solving a specific problem is his / her
   a. Domain
   b. Problem Domain
   c. Knowledge Base
   d. **Knowledge Domain**
4. A Knowledge Domain is a subset of a problem domain
   a. **True**
   b. False

5. ……. is an expert system used in chemical mass spectroscopy to identify chemical constituents?
   a. PROSPECTOR
   b. **DENDRAL**
   c. MYCIN
   d. DIPMETER

CHAPTER 192

CHAPTER 2

1. Using experience to solve problem is termed
   a. Induction
   b. **Heuristics**
   c. Deduction
   d. Story Board
2. Epistemology is the formal study of ……..
   a. Wisdom
   b. Data
   c. **Knowledge**
   d. Ideas
3. A knowledge that cannot be expressed by language is called
   a. Declarative
   b. **Tacit**
   c. Procedural
   d. Logical
4. The process of drawing valid conclusion is referred to as
   a. Reasoning
   b. Referencing
   c. **Logical Reasoning**
   d. Deterministic reasoning
5. A posteriori knowledge is _____
   a. That which proceeds
   b. **That which follows**
   c. That which precedes
   d. That which exceeds

CHAPTER 3

1. Trees consists of _____

CHAPTER 193

a. Nodes only
b. **Nodes and branches**
c. Branches only
d. None of the above

2. A …… is a diagram describing the finite number of states of a machine?
   a. ANS
   b. DNS
   c. **FSM**
   d. FGM
3. Graphs which have no cycles are
   a. Disconnected
   b. Digraph
   c. **Acyclic**
   d. Lattice
4. What type of tree has only a single pathway from the root to its one leaf? a. Lean tree
   b. Degenerate tree
   c. Atomic tree
   d. Binary tree
5. A path through the graph beginning and ending with the same node is called …… a. Simple graph
   b. Circuit
   c. Multi graph
   d. Digraph

CHAPTER 4

1. _____ is the lack of information to formulate a decision is known as
   a. Confusion
   b. Certainty
   c. Indecisive
   d. **Uncertainty**
2. Possible is a part of belief
   a. **True**
   b. False
3. Which of the following are not part of the common errors ……..?
   a. Incomplete error
   b. Unambiguous error
   c. **Simple error**
   d. Error of Precision
4. Which of the following errors relate to hypothesis?
   a. Errors of Precision
   b. System Errors
   c. Errors of Imprecision

CHAPTER 194

d. **False Positive**

5. Which of the following type of belief rules out possibility?
   a. Probable
   b. **Impossible**
   c. Certain
   d. Plausible

CHAPTER 5

1. A Fuzzy truth is called a Fuzzy qualifier
   a. False
   b. **True**
2. Minimizing local uncertainties is
   a. **Verification**
   b. Validation
   c. Reduction Error
   d. Error
3. _____ is a certainty factor can be used to rank in order of importance.
   a. Truth
   b. Belief
   c. Evidence
   d. **Hypothesis**
4. The Dempster-Shafer Theory is a method of uncertainty in expert systems
   a. False
   b. **True**

5. Minimizing the global uncertainties is
   a. Verification
   b. **Validation**
   c. Reduction Error
   d. Error

CHAPTER 195

ASANTE ALICE

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EXPERT SYSTEMS

16. What is an expert system?

An expert system is a program that attempts to mimic human expertise by applying inference methods to a specific body of knowledge.

17. In 1960, ---------- and ---------- wrote computer programs to test the hypothesis that intelligent behavior resulted from heuristic search.

Answer: Allan Newell, Herbert Simon

18. State three differences between Expert systems and Conventional systems.

Expert system	Conventional system
Knowledge is fragmented, implicit and is difficult to communicate except in small "chunks".	Knowledge is complete and explicit
Rules are complex and conditional	Rules are simple with few conditions
Problem-solving demands dynamic, context-driven, rules ,relationship	Problem-solving demands are predictable and repetitive sequences of actions.

19. Who is an EXPERT?
    Expertise is task-specific knowledge acquired and developed from training, reading and experience.
20. Which of the following is an element of an expert system?
    d. User mode b. **agenda** **c.** expert d. experience
21. Pick the odd one out. Problems with Expert Systems
    f. Limited domain
    g. Experts needed to setup and maintain system
    h. No "common sense"
    i. None of the above
22. An expert system can be used anywhere, any time.
    a. **True** b. False
23. Human experts are 100% reliable or consistent
    d. True b. **False**
24. Experts may not be good at explaining decisions
    b. **True** b. False
25. DENDRAL: Used to identify the structure of chemical compounds.
    d. **True** b. False
26. Which of the following is/are not expert system development tools?
    m. Symbolic Programming
    n. ES Shells

o. Human expert
p. Conventional Programming

27. An ideal ES should include which of the following?
    j. **Symbolic processing**.
    k. Open to inspection
    l. technical capabilities
28. Which of the following does not describe Expert system?
    m. Easily modified,
    n. Heuristic
    o. **Symbolic processing**
    p. Open to inspection
29. One of the disadvantages of ES is Expert systems are difficult and expensive to develop and maintain.
    b. **True** b. False
30. If an ES gives a wrong conclusion, it may be difficult to know whether this was caused by an error in the system or by an error in the information given to it.
    d. **True** b. False
31. State the Three-phase process in Decision making process
    Intelligence phase, Design phase and Choice phase
32. Explain the phases stated above in (Q16)
    a. **Intelligence phase**: collect the necessary information
    b. **Design phase**: method for considering data is designed
    c. **Choice phase**: select alternative
33. A representation of reality is called -------

Ans. **Model**

34. ---------- is sequence of steps
    Ans. **Algorithm**
35. ------- are categories of data considered in algorithm
    Ans.
    The expert system development lifecycle
36. State the phase 1: project initialization
    a. Problem definition
    b. Needs assessment
    c. Evaluation of alternative solutions
    d. Verification that an ES approach is appropriate
    e. Consideration of management issues
37. State the Phase 2: System analysis & design
    a. Produce conceptual design
    b. Decide development strategy
    c. Decide sources of knowledge, and ensure co-operation
    d. Select computer resources
    e. Perform a feasibility study
    f. Perform a cost-benefit analysis

CHAPTER 197

38. State Phase 3: Prototyping
    a. Build a small prototype
    b. Test, improve and expand it
    c. Demonstrate and analyse feasibility
    d. Complete the design
39. State Phase 4: System development
    a. Build the knowledge base
    b. Test, evaluate and improve the knowledge base
    c. Plan for integration
40. State Phase 5: Implementation
    a. Ensure acceptance by users
    b. Install, demonstrate and deploy the system
    c. Arrange orientation and training for the users
    d. Ensure security
    e. Provide documentation
    f. Arrange for integration and field testing

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CHAPTER 1

Q1. Areas of artificial intelligence include the following except…

a. CODING
b. Vision
c. Speech
d. Natural Language

Q2. The problem domain is a subset of the knowledge domain

a. True
b. False

Q3. Advantages of expert systems include

a. Increased cost
b. Reduced availability
c. Reduced danger
d. Reduced reliability

Q4. When an algorithm is not available or is insufficient, we rely on_____

a. Coding
b. Expert system
c. **Artificial intelligence**

d. Reasoning

Q5. Expert system relies on inference

a. True
b. False

Chapter 2

Q1. What does heuristic refer to ?

a. Statement
b. Logic
c. **Experience**
d. Data

Q2. What is epistemology?

a. The formal way of studying
b. The way of thinking
c. The study of how people reason
d. **The formal study of knowledge**

Q3. Venn diagrams can be used to represent knowledge

a. True
b. False

Q4. A v B (AvB)^(Av~B)

A v ~B A v (B^~B)

---------- A

A

The above is an example of

a. Modus ponens
b. Modus tollens
c. **Method of contradiction**
d. Resolution refutation

Q5. Met knowledge is knowledge about knowledge and expertise

a. **true**
b. false

Chapter 3

Q1. What does a tree consist of

a. node
b. branches
c. **both**
d. leaves

Q2. Every node many have two or more parents

a. true
b. **false**

Q3. The following are type of logic except
a. heuristic
b. generate and test
c. intuition
d. **syllogism**

Q4. What is the name given to the top node?

a. Root
b. Highest node
c. Head node
d. Child

CHAPTER 200

Q5. Lattice is an undirected graph

- **a. False**
- b. True

Chapter 4

Theories to deal with uncertainty include the following except:

- a. Bayesian probability
- b. **Neuman theory**
- c. Markov theory
- d. Hartley theory

Q2. All are types of belief except?

- a. Possible
- b. Probable
- c. **Conditional**
- d. Certain

Q3. Accepting a hypothesis is an error related to measurement

- a. True
- **b. false**

Q4. Systematic error and error related to hypothesis

- a. **false**
- b. true

CHAPTER 201

Q5. Inductive arguments can never be proven correct except in mathematical induction

a. **true**
b. false

Chapter 5.

Q1. _____ refers to minimizing the local uncertainties.

a. Validation
b. **Verification**
c. Authentication
d. Localization

Q2. _____ refers to minimizing the global uncertainties of the entire expert system.

a. Validation
b. Verification
c. Authentication
d. Localization

Q3. The _____ assumes that there is a fixed set of mutually exclusive and exhaustive elements called environment

a. Hartley theory
b. Markov theory
c. Dempster-Shafer theory
d. Von Neuman Theory

Q4. The extension principle defines how to extend the domain of a given crisp function to include fuzzy sets.

a. True

b. False

Q5. _____ is the most general theory of uncertainty formulated to date and has wide applicability due to the extension principle.

a. Hartley theory
b. Markov theory
c. Dempster-Shafer theory
d. **Fuzzy theory**

EXPERT SYSTEMS

CHAPTER 1

1. Expert system languages are post-fourth generation. True/False
2. What is a user interface?
    a) mechanism by which user and system communicate.
    b) mechanism by which users communicate.
    c) mechanism by which engine and system communicate.
    d) mechanism by which systems communicate.
3. Forward chaining method of inferencing is the best method for diagnosis. True/False
4. Which of the following best describes backward chaining?
    a) Reasoning from beliefs to conclusion
    b) Reasoning from facts to conclusion
    c) Reasoning from potential conclusion to be proven to facts
5. Inference engine draws conclusion from knowledge base. True/False.

CHAPTER 2

1. Logic is the study of making inferences given a series of facts. True/False
2. Which of the following best defines semantics?
    a) Is the use of symbols
    b) It's the symbols used in programming
    c) It's the meaning given to symbols

   d) None of the following
3. Heuristics refers to using experiences to solve problems. True/False
4. Which of the following isn't affected by knowledge?
   a) Development
   b) Speed
   c) Reliability
   d) Efficiency
5. Which of the following isn't a main focus of epistemology?
   a. Nature
   b. Origin of knowledge
   c. Structure of knowledge
   d. Conclusion results

CHAPTER 3

1. Which of the following is the right hierarchical data structure of a tree?
   a) Roots-branches-leaves
   b) Leaves-branches-roots
   c) Branches-roots-leaves
2. The leaves occupy the highest hierarchy. True/False
3. Graphs are sometimes called network. True/False
4. What is a FSM?
   a) Is a diagram describing the finite number of states of a machine
   b) Is a diagram describing the infinite number of states of a machine
   c) Is a machine that takes no input from user but gives valid conclusions
   d) Is a machine that various in multiple states at a time
5. In which year was PROLOG used as a commercial application for business and industry
   a) 1654s
   b) 1990s
   c) 1970s
   d) 1890s

CHAPTER 4

1. Expert systems provide an advantage when dealing with uncertainty as compared to decision trees. True/False.
2. Uncertainty is lack of information to formulate a decision. True/False
3. Which of the following is not an error related to measurement?
   a) Systematic errors
   b) Error of accuracy
   c) False negative
   d) Error of precision
4. What's the proper formula expression for compound probability?
   a) $P(A \cap B) = P(A)\,P(B)$
   b) $P(A \cap B) = \frac{n(A \cap B)}{n(S)}$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(A \cap B) = P(A|B)\ P(B)$$

c)

5. …… was the first expert system to discover a valuable molybdenum.

CHAPTER 5

1. Which are the most used methods in solving uncertainty problems.
    a) Fuzzy logic translation rules
    b) Bayesian theory and Dempster-Shafer
    c) Dempster-Shafer and Fuzzy logic
    d) Fuzzy logic and Bayesian theory
2. Possibility distribution and Probability distribution are the same. True/False
3. Fuzzy logic is an extension of multivalued logic True/False
4. Which of the following is not an application of fuzzy logic?
    a) Engineering
    b) Psychology
    c) Environment
    d) Literature
    e) None of the above
5. An environment is a frame of discernment when its elements may be interpreted as possible answers and of which only one answer is correct. True/False

ANSWERS

CHAPTER 1

1. False
2. A
3. False
4. C
5. True

CHAPTER 2

1. True
2. C
3. True
4. C
5. D

CHAPTER 3

1. A
2. False
3. True

4. A
5. B

CHAPTER 4

1. True
2. True
3. C
4. B
5. PROSPECTOR

CHAPTER 5

1. D
2. False
3. True
4. E
5. True

4700515 – Afrifa Sarpong George

Expert Systems Assignment

Chapter 1:

1. An expert system can have one or more domains.
   a. True
   b. **False**
   c. None of the above
2. Which of the following is true?
   a. Problem domain is a subset of knowledge domain
   b. Problem domain is a superset of knowledge domain
   c. Problem domain is equivalent to Knowledge domain
   d. Both do not have any relationship
3. Which of the following is deep knowledge based on?
   I. Heuristic knowledge
   II. Function
   III. Empirical knowledge
   IV. Basic structure
   V. Behavior of objects
      a. I,II &III
      b. I & II ONLY
      c. II,IV & V
      d. All the above
4. Which of the following may not be an expert system?
   a. PROSPECTOR

b. MYCIN
c. DIPMETER
d. None of the above

5. All are elements of an expert system except….
   a. User Interface
   b. Working memory
   c. **User**
   d. Inference engine

Chapter 2:

1. Which of the following describes the meanings we give to symbols?
   a. **Semantics**
   b. Inference
   c. Integers
   d. Alphabets
2. Which of the following does knowledge affect?
   I. Efficiency
   II. Development
   III. Maintenance
   IV. Speed
      a. IV only
      b. II and III only
      c. I and II only
      d. **All the above**
3. Expert systems ……. As humans …….
   a. **Infer, reason**
   b. Refer, decide
   c. Compare, contrast
   d. None of the above
4. Re-arrange the following in ascending order…
   I. Data
   II. Meta-knowledge
   III. Knowledge
   IV. Noise
   V. Information
   VI. Wisdom
      a. IV, III, VI, I, V,II
      b. I, II, III, IV, V, VI
      c. IV, I, V, III, II, VI
      d. I, III, V, II, VI, IV
5. What is best used for simulating commonsense knowledge;
   a. Pages
   b. Scripts

c. **Frames**
d. Diagrams

Chapter 3:

1. The lowest hierarchy of a tree is known as …. Whiles the highest hierarchy is known as …
   a. root, leaf
   b. stem, branch
   c. leaf, root
   d. branch, stem
2. Which of these will be answers and questions respectively?
   a. Stem and root
   b. **Leaves and nodes**
   c. Leaves and branches
   d. All the above
3. What can be used to define an objects behavior>
   a. Safe state
   b. Space state
   c. State space
   d. None of the above
4. Which of these isn't a type of logic?
   a. Analogy
   b. Abduction
   c. Induction
   d. Deduction
   e. **None of the above**
5. Which of these types of logics has no proven theory?
   a. Heuristics
   b. Generate and test
   c. **Intuition**
   d. Auto-epistemic

Chapter 4:

1. Uncertainty is a result of …….
   a. **Lack of information**
   b. Lack of knowledge
   c. Lack of facts
   d. Lack of inference
2. Pick the odd one out.
   a. Markov's model
   b. Dempster-shafer theory
   c. Bayesian probability

CHAPTER 208

d. **Gaussian theory**

3.

Chapter 5:

1. Verification is concerned with the correctness of the systems building blocks.
   a. **True**
   b. False
2. Is a system guaranteed to give correct answers, provided all rules are true?
   a. Yes
   b. **No**
3. The reluctance by the physicians stems from the likelihood of belief / disbelief – not in the probabilities.
   a. True
   b. false
4. The certainty factor, CF, is not a way of combining belief and disbelief into a single number.
   a. True
   b. **False**
5. An environment is called a ….. of discernment when its elements may be interpreted as possible answers and only one answer is correct.
   a. **Frame**
   b. Script
   c. Page
   d. None of the above

4713315

CHAPTER 1

1. Which of the following expert systems is used to diagnose/remedy bacterial infections?
   a. DENDRAL
   b. **MYCIN**
   c. SOPHIE
   d. ANNA
2. Which of the following expert systems is used to interpret molecular structure?
   a. CRYSALIS
   b. **DENDRAL**
   c. MYCIN
   d. SPEX

CHAPTER 209

3. Which of the following expert systems is used to interpret geological data for minerals?
    a. MUD
    b. STEAMER
    c. **PROSPECTOR**
    d. DELTA
4. Which of the following expert systems in used to diagnose lung disease?
    a. MYCIN
    b. DENDRAL
    c. **PUFF**
    d. DELTA
5. Which of the following expert systems is used to diagnose telephone network faults.
    a. **ACE**
    b. NDS
    c. SPEX
    d. SOPHIE

CHAPTER 2

1. _____ knowledge is knowing that something is true or false.
    a. Tacit
    b. Procedural
    c. **Declarative**
    d. None of the above
2. _____ knowledge cannot be expressed by language

a. Procedural

b. Tacit

c. Neither A nor B

Either A or B

3. _____ knowledge is derived from the senses.

a. A priori

b. A posteriori

c. Procedural

d. None of the above

4. A semantic net is an example of _____.

a. Deep knowledge

b. Shallow knowledge

c. None of the above

d. Both of the above

5. A _____ is a compound statement that is always false.

a. Contradiction

b. Contingent

c. Tautology

d. Singleton

CHAPTER 210

Chapter 3

1. Which of these is odd

a. Node

b. Branch

c. Leaf

d. Sector

2. All of these are examples of Simple graphs except

a. Connected graph

b. Non-connected graph

c. trigraph

d. Lattice

Use the following syllogism to answer the questions that follow

All M are P

All S are M

∴ All S are P

3. Which of the following is the middle term?
   a. **M**
   b. P
   c. S
   d. None of the above
4. Which of the following is the major premise?
   a. All M are P
   b. All S are M
   c. All S are P
   d. None of the above
5. Which of the following is the minor premise?
   a. All M are P
   b. All S are M
   c. All S are P
   d. None of the above

Chapter 4

CHAPTER 211

1. _____ is the belief that more than one possibility exists.
    a. Certain
    b. **Plausible**
    c. Probable
    d. Possible

2. A/An _____ has only one element.
    a. Compound event
    b. **Simple event**
    c. Event tree
    d. None of the above

3. _____ is the belief that evidence is logically true or false.
    a. Plausible
    b. Probable
    c. **Certain**
    d. Possible

4. _____ is the belief that no matter how remote, the hypothesis cannot be ruled out/
    a. Probable
    b. **Possible**
    c. Certain
    d. Impossible

5. When repeated trials give the same results, the system is said to be _____
    a. **Deterministic**
    b. Nondeterministic
    c. Random
    d. None of the above

CHAPTER 5

1. _____ refers to minimizing the local uncertainties.
    a. Validation
    b. **Verification**
    c. Both of the above
    d. None of the above
2. _____ refers to minimizing the global uncertainties of the entire expert system.
    a. Verification
    b. **Validation**
    c. Both of the above
    d. None of the above

3. The ad hoc introduction of formulas such as fuzzy logic into a probabilistic system introduces a problem.
    a. **True**
    b. False

4. The extension principle defines how to extend the domain of a given crisp function to include fuzzy sets.
    a. **True**
    b. False

5. Which of the following are applications of fuzzy theory?
    a. Decision making
    b. Medical diagnosis
    c. **Both of the above**
    d. None of the above

NAME: OSEI DENNIS OWUSU

INDEX NUMBER: 4711315

COURSE: CSM 497

CHAPTER ONE

1. An expert system is a computer system that _____ the decision-making ability of a human expert.
   A. Stimulate
   B. Simulate
   C. Emulate
   D. Incorporates

   Ans: C

2. Which of the following is not an advantage of an expert system?
   A. Increased availability
   B. Increased cost
   C. Reduced danger
   D. Increased reliability

   Ans: B

3. _____ is used in chemical mass spectroscopy to identify chemical constituents.
   A. MYCIN
   B. DIPMETER
   C. DENDRAL
   D. PROSPECTOR

   Ans: C

4. _____ is a prioritized list of rules created by inferences engine, whose patterns are satisfied by facts or objects in working memory.
   A. Knowledge Acquisition Facility
   B. Knowledge Base
   C. Agenda
   D. Exploration Facility

   Ans: C

5. A practical limitation of many expert systems is lack of _____.
   A. Causal knowledge

B. Shallow knowledge
C. Deep knowledge
D. Knowledge bottleneck

Ans: A

CHAPTER TWO

1. Expert systems are designed for knowledge representation based on rules of logic called _____ .
   A. Facts
   B. Inferences
   C. Semantics
   D. Reasoning

   Ans: B

2. Epistemology is concerned with the following except _____ .
   A. Nature of knowledge
   B. Structure of knowledge
   C. Rules of knowledge
   D. Origins of knowledge

   Ans: C

3. Metaknowledge is knowledge about knowledge and _____ .
   A. Facts
   B. Inferences
   C. Semantics
   D. Expertise

   Ans: D

4. A frame is a group of slots and _____ that defines a stereotypical object that is used to represent generic or specific knowledge.
   A. Filters
   B. Fillers
   C. Files
   D. Facets

   Ans: B

5. Logic is the study of rules of exact reasoning inferring conclusions from _____ .
   A. Context
   B. Inference
   C. Premises
   D. Facts

   Ans: C

CHAPTER THREE

1. A circuit is a path through the graph beginning and ending with the same _____ .
   A. Root
   B. Child
   C. Parent
   D. Node

   Ans: D

2. All the following are types of logic except _____ .
   A. Deduction
   B. Induction
   C. Epistemology
   D. Analogy

   Ans: C

3. Which of the following is not a deductive logic?
   A. Argument
   B. Syllogism
   C. Analogy
   D. Predicate

   Ans: D

4. A state space can be used to describe an object's _____ .
   A. Activities
   B. Behavior
   C. Status
   D. Characteristics

   Ans: B

5. Finite State Machines are often used in _____ and validity checking programs.
   A. Reasoning
   B. Interpreters
   C. Inference
   D. Compilers

   Ans: D

CHAPTER FOUR

1. Uncertainty is lack of _____ to formulate a decision.
   A. Data
   B. Information
   C. Facts
   D. Context

   Ans: B

2. A system is _____ when repeated trials give the exact same results.
   A. Defined
   B. Bounded
   C. Certain
   D. Deterministic

   Ans: D

3. Which of the following is an approach to temporal reasoning?
   A. Events
   B. Probabilities
   C. Hypotheses
   D. Experiments

   Ans: B

4. Which of the following are not characteristics of Markov Chain _____?
   I. The process has a finite number of possible states.
   II. The process can be in one and only one state at any one time.
   III. The process can be in multiple states depending on the previous state.
   IV. The process moves or steps successively from one state to another over time.
   V. The probability of a move depends on the two preceding states.

   A. I and IV
   B. II and III

C. III and V
D. II and IV
E. I and V

Ans: C

5. _____ probability defines the probability of an event as the limit of frequency distribution.
   A. Objective
   B. Subjective
   C. Experimental
   D. Theoretical

   Ans: C

CHAPTER FIVE

1. Validation refers to minimizing the _____ uncertainties while Verification refers to minimizing the _____ uncertainties of the expert system.
   A. Probable, Unlikely
   B. Unlikely, Probable
   C. Local, Global
   D. Global, Local

   Ans: D

2. The environment can also be termed as _____ in set theory.
   A. Covering
   B. Surrounding
   C. Universe
   D. Space

   Ans: C

3. Redundant rules occur when a rule is modified by _____.
   A. Pattern Deletion
   B. Pattern Resolution
   C. Pattern Retrieval
   D. Pattern Creation

   Ans: A

4. Uncertainties are associated with _____ and assignment of values.
   A. Formulation of Rules

B. Reviewing of Rules
C. Analysis of Rules
D. Creation of Rules

Ans: D

5. Which of the following is a factor in conflict resolution?
   A. Order that rules are formulated
   B. Order that rules are entered
   C. Order that rules are created
   D. Order that rules are reviewed

   Ans: B

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Expect Systems Assignment

Question 1

The following are characteristic of an Expect System except…

a. High Performance
b. Understandable
c. Bad Reliable
d. Adequate Response Time

Answer: Bad Reliable

Question 2

A rule corresponds to a small, modular collection of knowledge called chunk.

CHAPTER 219

True/ False

Answer: True

Question 3

Trait knowledge is sometimes called Unconscious knowledge because it cannot be expressed by language.

True/ False

Answer: True

Question 4

Every node may give rise to zero or more child nodes.

True/ False

Answer: True

Question 5

Which of the following are events that do not affect each other?

a. Dependent event
b. Independent event
c. Subjective event
d. Experimental event

Answer: Independent Event (B)

Questions 6

Dempster's rule combines mass to produce a new mass that represents the consensus of the original, possibly conflicting evidence.

True/ False

Answer: True

Chapter 1

CHAPTER 220

1. An Expert System is a computer system that emulates,or acts in all respects with the
   a) Making-decision capabilities of a human expert
   b) Decision-making capabilities of a human expert
   c) Decision-making capabilities of a machine expert
   d) Making decision capabilities of a automated expert

2.They are obtainable from books, magazines,knowledgeable persons

a)Inference machine

b)**knowledge base**

c)knowledge machine

d)Inference Knowledge

3. They are drawn from conclusions from the knowledge base

a)**Inference machine**

b)knowledge base

c)knowledge machine

d)Inference Knowledge

4.It is an ideal solution guaranteed to yield a solution in a finite amount of time

a) an impulse

b)a system

c)an expert system

d)**an algorithm**

5.Mycin is used for

a)for chemical mass spectroscopy to identify chemical constituents

b)**medical diagnosis of illness**

c)configuring computer systems

d)geological data analysis for oil

Chapter2

CHAPTER 221

1. The meanings we give to symbols
   a)Action
   b)**semantics**
   c)Logic
   d)Reasoning

2. An Arguments refers to the formal way facts and rules of inferences are used

   a)To call for judgements

   b)To base off the rules

   c)**To reach valid conlcusions**

   d)to call for basement of both sides

3. A priori knowledge is that which preeceds except

   a)universally true

   b) Cannot be denied without contracdiction

   c)independent of the scenes

   d) **Hopes for the future**

4. what is a frame?

   a) The boundary that covers the egde of an object

   b**)A group of slots and fillers that defines a stereotypical object that is used to represent generic /specific knowlegde**

   c)Frames re objects possessing all typical characteristics of whatever is being modeled

   d) They represent knowledge about narrow subjects having much default knowledge

5.Boolean logic defines a set of axioms consisting of symbols to represent

   a)Frames

   b)**Objects**

   c)Symbols

   d)Modes

Chapter 3

CHAPTER 222

1.What is the number a binary tree restricts the number of children to

a)1

b)**2**

c)3

d)4

2. A Tree consist of a

a) Root and leaves

b)parent and children

c)**Nodes and Branches**

d)Nodes and roots

3.A graph sometimes called a

a) Connection

b)lines

c**) Network**

d)drawings

4 _____ can be used to define an object's behavior

a) A state space
b) A space state
c) A Space
d) A state

5.Syllogism has

a) One premise and one conclusion

b)Two premises and two conclusions

c)One premise and two conclusions

d**)two premises and one conclusion**

Chapter 5

CHAPTER 223

1.The theory of which is a method of inexact reasoning

a)Dempster-Shafer Theory

b)Dempster Theory

c)Demter Theory

d)Dempster-Safer Theory

2.Verification and validation refers to

a)minimizing the global uncertainties and minimizing the local uncertainties of the entire expert system

b)minimizing the local uncertainties and minimizing the global uncertainties of the entire expert system

c) maximizing the global uncertainties and minimizing the local uncertainties of the entire expert system

d)Maximizing the local uncertainties and maximizing the global uncertainties of the entire expert system

3_____ The rules kay fire with contradictory consequents, possibly as a result of antecedents not being specified properly

a) Contradiction of rules
b) Potential contradiction of rules
c) Subsumption of rules
d) Subsumption Contradiction

4_____ One rules is subsumed by another if a portion of its antecedent is a subset of another rule.

a) Contradiction of rules
b) Potential contradiction of rules
c) Subsumption of rules
d) Subsumption Contradiction

5_____ is a theory of uncertainty based on fuzzy logic and concerned with quantifying and reasoning using natural language where words have ambiguous meaning

a)Fuzzy Logic

b)Soft computing

c)Neural nteworks

d) Approximate Reasoning

Chapter 6

CHAPTER 224

1. Stages in system development are
   a)Feasibilty study, rapid prototype,Refined system,Field testable,Commercial Quality system,Maintenance and evolution

   b)Feasibilty study, Maintenance and evolution, rapid prototype,Refined system,Field testable,Commercial Quality system

   c) Refined system ,Feasibilty study, Maintenance and evolution, rapid prototype,Field testable,Commercial Quality system

   d) Feasibilty study, Maintenance and evolution, Refined system,Field testable,Commercial Quality system, rapid prototype

ASSIGNMENT 4718215

CHAPTER ONE

1. Who is a person trained to interact with a human expert in order to capture their knowledge?
   A. Knowledge developer
   B. Knowledge engineer
   C. Knowledge programmer
   D. Knowledge extractor
2. A structure designed to store data for decision support is?
   A. Operational database
   B. Flat file
   C. Decision tree
   D. Data warehouse
3. Database query is used to uncover this type of knowledge.
   A. Deep
   B. Hidden
   C. Shallow
   D. multidimensional

4. Which of the following is an advantage of using an expert system development tool?
    A. imposed structure
    B. knowledge engineering assistance
    C. rapid prototyping
    D. all of the mentioned

5.

CHAPTER TWO

1. Which statement is true about neural network and linear regression models?
    A. Both models require numeric attributes to range between 0 and 1
    B. Both models require input attributes to be numeric
    C. The output of both models is a categorical attribute value
    D. Both techniques build models whose output is determined by a linear sum of weighted input attribute values
    E. More than one of a, b, c or d is true
2. Another name for an output attribute.
    A. predictive variable
    B. independent variable
    C. estimated variable
    D. dependent variable
3. Which statement is true about prediction problems?
    A. The output attribute must be categorical.
    B. The output attribute must be numeric.
    C. The resultant model is designed to determine future outcomes.
    D. The resultant model is designed to classify current behavior.
4. Unlike traditional production rules, association rules
    A. low the same variable to be an input attribute in one rule and an output attribute in another rule.
    B. allow more than one input attribute in a single rule.
    C. require input attributes to take on numeric values.
    D. require each rule to have exactly one categorical output attribute.
5. Which statement is true about prediction problems?
    A. The output attribute must be categorical.
    B. The output attribute must be numeric.
    C. The resultant model is designed to determine future outcomes.
    D. The resultant model is designed to classify current behavior.

CHAPTER THREE

1. Given a rule of the form IF X THEN Y, rule *confidence* is defined as the conditional probability that

   A. Y is true when X is known to be true.
   B. X is true when Y is known to be true.
   C. Y is false when X is known to be false.
   D. X is false when Y is known to be false.

2. A data mining algorithm is *unstable* if
   A. test set accuracy depends on the ordering of test set instances.
   B. the algorithm builds models unable to classify outliers.
   C. the algorithm is highly sensitive to small changes in the training data.
   D. test set accuracy depends on the choice of input attributes.
3. Which statement is true about the decision tree attribute selection process described in your book?
   A. A categorical attribute may appear in a tree node several times but a numeric attribute may appear at most once.
   B. A numeric attribute may appear in several tree nodes but a categorical attribute may appear at most once.
   C. Both numeric and categorical attributes may appear in several tree nodes.
   D. Numeric and categorical attributes may appear in at most one tree node.
4. Based on the two-item set table, which of the following is *not* a possible two-item set rule?
   A. IF Life Ins Promo = Yes THEN Magazine Promo = Yes
   B. IF Watch Promo = No THEN Magazine Promo = Yes
   C. IF Card Insurance = No THEN Magazine Promo = Yes
   D. IF Life Ins Promo = No THEN Card Insurance = No

5. An evolutionary approach to data mining.
   A. backpropagation learning
   B. genetic learning
   C. decision tree learning
   D. linear regression

CHAPTER FOUR

1) A particular categorical attribute value has a predictiveness score of 0.3 and a predictability score of 0.3. The attribute value is
   A. necessary but not sufficient for class membership.
   B. sufficient but not necessary for class membership.
   C. necessary and sufficient for class membership.
   D. neither necessary nor sufficient for class membership.

2) A particular categorical attribute value has a predictiveness score of 0.5 and a predictability score of 1.0. The attribute value is
   A) necessary but not sufficient for class membership.
   B) sufficient but not necessary for class membership.
   C) necessary and sufficient for class membership.
   D) neither necessary nor sufficient for class membership
3) The single best representative of a class.
   A) centroid
   B) mean
   C) signature prototype
   D) prototype
4) Suppose that the predictiveness score for *risk factor = medium risk* is 0.50. How many domain instances have a value of medium risk for the risk factor attribute?
   a) 10
   b) 20
   c) 30
   d) 40
5) Which relationship is likely to be seen with an interesting clustering of data instances?
   a) The domain resemblance score is greater than the resemblance scores for the individual clusters.
   b) The domain resemblance score is equal to the average of the resemblance scores for the individual clusters.
   c) The resemblance scores for all formed clusters are greater than zero.
   d) The domain resemblance score is less than the resemblance scores for the individual clusters.

CHAPTER FIVE

1) The relational database model is designed to
   A) promote data redundancy.
   B) minimize data redundancy.
   C) eliminate the need for data transformations.
   D) eliminate the need for data preprocessing.
2) This data transformation technique works well when minimum and maximum values for a real-valued attribute are known.
   A) min-max normalization
   B) decimal scaling
   C) z-score normalization
   D) logarithmic normalization
3) A common method used by some data mining techniques to deal with missing data items during the learning process.
   A) replace missing real-valued data items with class means

B) discard records with missing data
C) replace missing attribute values with the values found within other similar instances
D) ignore missing attribute values

4) A data normalization technique for real-valued attributes that divides each numerical value by the same power of 10.
A) min-max normalization
B) z-score normalization
C) decimal scaling
D) decimal smoothing

5) This technique uses mean and standard deviation scores to transform real-valued attributes.
A) decimal scaling
B) min-max normalization
C) z-score normalization
D) logarithmic normalization

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Chapter 1

1. An expert system is a computer system that emulates, or acts in all respects, with the decision-making capabilities of a_____.

   a. Human expert
   b. AI system
   c. Cpu
   d. Information system

   Ans : a;

2. All the following are areas of Artificial intelligence except.
   a. Expert Systems
   b. Speech
   c. Artificial Neural systems
   d. Data communication
   Ans: d

3. Which of these is a main component of an expert system
   a. User interface
   b. Knowledge base

c. Central unit
d. Data centre
Ans : b

4. All the following are advantages of expert systems except.
   a. Increased availability
   b. Reduced cost
   c. Reduced efficiency
   d. Performance
   Ans : c

5. What is process of building an expert system:
   i. The knowledge engineer establishes a dialog with the human expert to elicit knowledge.
   ii. The knowledge engineer codes the knowledge explicitly in the knowledge base.
   iii. The expert evaluates the expert system and gives a critique to the knowledge engineer.
   iv. The expert builds the system.

   a. i , ii
   b. I,ii,iii
   c. Iv, ii , i
   d. Iv,i

   Ans: b

Chapter 2

6. Which of these is not a goal of expert systems
   a. We need to be able to separate the actual meanings of words with the reasoning process itself.
   b. We need to make inferences w/o relying on semantics.
   c. We need to reach valid conclusions based on facts only.
   d. Get experts to build sophisticated systems

   Ans : d;

7. Epistemology is the formal study of _____.
   a. Knowledge
   b. Wisdom
   c. Peace
   d. Law

   Ans: a;

8. Which of these is not a category of epistemology
   a. Philosophy
   b. A priori
   c. Procedural
   d. discrete

   Ans: d;

9. A priori knowledge includes
   a. “That which precedes”
   b. Independent of the senses
   c. Similar sequence
   d. Continuous happenings

   Ans : a , b

10. Meta knowledge is knowledge about knowledge and _____.
    a. Goals
    b. Expertise
    c. Vision
    d. aims

    ANS : b;

Chapter 3

11. A tree is a hierarchical data structure consisting of:
    a. Nodes and Branches
    b. Leaves and roots
    c. Stem and branch
    d. Nodes and roots

    Ans : a;

12. Every node, except the root, has exactly_____ parent.
    a. Two
    b. Three
    c. One
    d. Four
    Ans: c

13. A binary tree restricts the number of children per node to a maximum of _____.
    a. One
    b. Three
    c. Two
    d. Four

    Ans : c

14. Graphs are sometimes called a _____.
    a. Community
    b. Illustration
    c. Drawable tree
    d. Network

    Ans : d;

15. Acyclic graphs have _____cycles.
    a. No
    b. One
    c. Two or more
    d. None of the above

    Ans : a

Chapter 4

16. Expert systems deal with uncertainty using the following except

a. Expert systems provide an advantage when dealing with uncertainty as compared to decision trees.

b. With decision trees, all the facts must be known to arrive at an outcome.
c. Probability theory is devoted to dealing with theories of uncertainty.
d. Rebuild the system

    Ans : d

17. All the following are theories to deal uncertainty except
    a. Bayesian Probability
    b. Hartley Theory
    c. Shannon Theory
    d. Muller-lyer illusion

    Ans: d

18. Deductive reasoning deals with exact facts and exact conclusions
    a. True
    b. Flase

    Ans: a

19. Which of these is an error related with measurement
    a. Errors on manipulation
    b. Errors on accuracy
    c. Errors on pointers
    d. Errors on planning

    Ans : b

20. Which of the following is a Markov chain characteristic
    a. The process has a infinite number of possible states.
    b. The process can be in two or more states at any one time.
    c. The process moves or steps successively from one state to another over time.
    d. The probability of a move depends only on the immediately following state

    Ans : c

Chapter 5

21. Which of these is not the goal of the knowledge engineer
    a. The knowledge engineer endeavors to minimize, or eliminate, uncertainty if possible.
    b. Minimizing uncertainty is part of the verification of rules.
    c. Verification is concerned with the correctness of the system's building blocks – rules.
    d. Maximizing the margin of error.

    Ans: d

22. Verification refers to_____.
    a. Minimizing the local uncertainties.

b. Minimizing the global uncertainties of the entire expert system.
c. creation of rules and also with assignment of values
d. eliminate, uncertainty if possible.

Ans: a

23. The Dempster-Shafer theory assumes that _____.
    a. evidence supports the hypothesis
    b. there is a fixed set of mutually exclusive and exhaustive elements called environment

    Ans: b

24. In fuzzy sets, an object may partially belong to a set measured by the membership function – grade of membership.
    a. True
    b. False

    Ans: a

25. The extension principle defines how to extend the domain of a given crisp function to include fuzzy sets.
    a. True
    b. False

    Ans : a;

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1. Which of the following is not a characteristic of expert systems?
    a. High performance
    b. Adequate response time
    c. Good reliability
    d. Ornamentality
1. The knowledge base contains information with which the …….. draws conclusions.
    a. Inference engine
    b. Fact base
    c. Referral mechanism
    d. Expertise
2. An expert system …….. the decision making abilities of a human expert.
    a. Simulate
    b. Emulate
    c. Endorse
    d. Reprise

3. The advantages of expert systems include …….
   a. Reduced cost
   b. Problem simulation
   c. Lower expertise
   d. Less methods
4. One of the major roots of expert systems is the area of human information processing called ……
   a. Ammendentation
   b. Cognitive science
   c. Human processing information
   d. Brain activity methods

Chapter 2

5. The study of knowledge is known as …….
   a. Epistemology
   b. Etymology
   c. Know study
   d. Procedure
6. …….. is knowledge about knowledge and expertise.
   a. Nano knowledge
   b. Wisdom
   c. Metaknowledge
   d. Knowledge and more
7. …… is the graphical representation of a sentence.
   a. Derivation tree
   b. Barse tree
   c. Linear sequence
   d. Binary tree
8. Semantic nets are also referred to as ……..
   a. Base nets
   b. Qualified nodes
   c. Associative nets
   d. Singular nets
9. A …….. search proceeds one level at a time before descending to a lower level.
   a. Breadth first
   b. Depth first
   c. Higher level
   d. Greedy

Chapter 3

10. A tree is a hierarchical structure consisting of ……..
    a. Nodes
    b. Bases
    c. Edges
    d. Stumps

11. Propositional logic can be used to describe arguments
    a. True
    b. False
    c. I don't know
    d. It may be so
12. Modus ponens and modus tollens are …….
    a. Statutes of knowledge
    b. Laws of degree
    c. Rules of inference
    d. Layers of insolence
13. Reasoning from facts to conclusions is known as ……
    a. Forward chaining
    b. Backward chaining
    c. Chassis chaining
    d. Reverse chaining
14. ……. Chaining is also called bottom-up chaining.
    a. Forward chaining
    b. Backward chaining
    c. Chassis chaining
    d. Reverse chaining

Chapter 4

15. The types of errors include the following except
    a. Incompleteness
    b. Incorrectness
    c. Inadamant
    d. Ambiguity
16. A …….. is an assumption to be treated
    a. Topic
    b. Statement
    c. Hypothesis
    d. Analogy
17. A …… belief means that the belief is true
    a. Certain
    b. Impossible
    c. Plausible
    d. Probable
18. A …… belief means that more than a possibility exists.
    a. Certain
    b. Impossible
    c. Plausible
    d. Probable
19. A(n) …….. can be defined as a directed acyllic graph in which the nodes are assertions and the arcs are measures of uncertainty.

a. Referral prise
b. Inference net
c. Interwinding mechanism
d. Binary tree

Chapter 5

20. A 'frame of discernment' is otherwise known as
    a. Environment
    b. Area
    c. Abstract
    d. Duty
21. The degree of membership in a fuzzy set is measured by generalization of the characteristic function called ……
    a. Membership function
    b. Allowance function
    c. Logic function
    d. Inferral
22. Fuzzy logic was based on Lotfi Zadeh's …… paper.
    a. 1940
    b. 1860
    c. 1345
    d. 1965
23. Fuzzy set operators include….
    a. Set quality
    b. Set conference
    c. Set collaboration
    d. Subsets
24. Fuzzy sets and …… can be used to quantify the meaning of natural language.
    a. Linguistic variables
    b. Artificial meanings
    c. Heuristic rules
    d. Anonymity

CHAPTER 1

1. An expert system is

    a**. a computer that can answer questions like a human expert**
    b. a group of scientists who design computer programs
    c. a method of producing new words
    d. a computer that can feel emotions.

2. The fact that computers are programmed is not a good objection to mechanism because

    a. the programming of computers is so complicated
    b**. it is not true, because computers' functions are built in**
    c. television programs are irrelevant to intelligence
    d. people are programmed just as computers are.

3. A computer based information system is needed:

I. as it is difficult for administrative staff to process data.
II. due to rapid growth of information and communication technology.
III. due to growing size of organizations which need to process large volume of data.
IV. as timely and accurate decisions are to be taken.

Which of the above statement(s) is/are true?

a. I and II
b. III and IV
c. II and III
d. II and IV

4. Which of the following is false for the programming language PROLOG?

a. A PROLOG variable can only be assigned to a value once
b. PROLOG is a strongly typed language
c. The scope of a variable in PROLOG is a single clause or rule
d. The scope of a variable in PROLOG is a single query

5. An expert system shell is an expert system without:

a. Domain knowledge
b. Explanation facility
c. Reasoning with knowledge
d. All of the above

CHAPTER 2

1. Propositional logic uses symbols to stand for statements and...

   a. Nonstatements
   b. The relationships between subject and predicate
   c. Truth values
   d. **The relationships between statements**

2. The symbolization for a conjunction is...

   a. p → q
   b. **p & q**
   c. p v q
   d. ~ *p*

3. In a disjunction, even if one of the statements is false, the whole disjunction is still...

   a. False
   b. Negated
   c. **True**
   d. Both true and false

4. In a conditional statement, the first part is the antecedent and the second part is the...

   a. Predicate
   b. **Consequent**
   c. Subject
   d. Disjunctive

5. The name of the following argument form is... p → q ~ *p* ∴ ~ *q*

   a. Denying the consequent
   b. Disjunctive syllogism
   c. Modus tollens
   d. **Denying the antecedent**

CHAPTER 3

1. Which of the following statement is the negation of the statement, "2 is even and – 3 is negative"?

A. 2 is even and – 3 is not negative.
B. 2 is odd and – 3 is not negative.
C. 2 is even or – 3 is not negative.
D. 2 is odd or – 3 is not negative.

2. If A×B=B × A, (where A and B are general matrices) then

A. A=φ
B. A =B'
C. **B = A.**
D. A' =B.

3. A partial ordered relation is transitive, reflexive and

A. **antisymmetric.**
B. bisymmetric.
C. antireflexive.
D. asymmetric.

4. Let N = {1, 2, 3,.} be ordered by divisibility, which of the following subset is totally ordered,

A. (2,6,24).
B. (3,5,15).
C. (2, 9, 16).
D. (4,15,30).

5. If B is a Boolean Algebra, then which of the following is true

A. B is a finite but not complemented lattice.
B. **B is a finite, complemented and distributive lattice.**
C. B is a finite, distributive but not complemented lattice.
D. B is not distributive lattice

CHAPTER 4

1. **In a rule-based system, procedural domain knowledge is in the form of:**

A. production rules

B. rule interpreters

C. meta-rules

D. control rules

2. **The field that investigates the mechanics of human intelligence is:**

A. history

B. cognitive science

C. psychology

D. sociology

3. **What is the term used for describing the judgmental or commonsense part of problem solving?**

A. Heuristic

B. Critical

C. Value based

D. Analytical

4. **Special programs that assist programmers are called:**

A. heuristic processors
B. symbolic programmers
C. intelligent programming tools

D. program recognizers
E. None of the above

5. If the English Philosopher Thomas Hobbes could be called 'grandfather' of artificial intelligence, then who could be called its father?

A. A.M. Turning
B. John McCarthy
C. Allen Newell
D. Herbert Simon
E. None of the above

CHAPTER 5

1. What is the term used for describing the judgmental or commonsense part of problem solving?

A. **Heuristic**

B. Critical

C. Value based

D. Analytical

2. What stage of the manufacturing process has been described as "the mapping of function onto form"?

A. **Design**

B. Distribution

C. project management

D. field service

3. Which kind of planning consists of successive representations of different levels of a plan?

A. project planning

B. non-hierarchical planning

C. All of the mentioned

D. **hierarchical planning**

4. What was originally called the "imitation game" by its creator?

A. LISP

B. **The Turing Test**

C. Cybernetics

D. The Logic Theorist

5. PROLOG is an AI programming language which solves problems with a form of symbolic logic known as predicate calculus. It was developed in 1972 at the University of Marseilles by a team of specialists. Can you name the person who headed this team?

A. **Alain Colmerauer**

B. Nicklaus Wirth

C. Seymour Papert

D. John McCarthy

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EXPERT SYSTEM WORK

Chapter 1 – Introduction of Expert System

1. Advantage of Expert systems include all except

a. increased performance

b. increased availability

c. Permanence

d. Reduction of cost and danger

2. ……. defined an expert system as "an intelligent computer program that uses knowledge and inference procedures to solve problems that are difficult enough to require significant human expertise for their solution".

a. Prof. Edward Feigbaum

b. Edward Feigenbaum

c. Prof. Edmond Feigenbaum

d. Prof. Edward Feigenbaum

3. A meta- explanation that explains the expert system's explanation of its reasoning is ……

a. Knowledge Acquisition

b. Knowledge Engineering

c. Warrant

d. Bottleneck

4. The acquisition of knowledge from a human expert and coding it expert system is termed as

a. Knowledge Acquisition

b. Knowledge Engineering

c. Warrant

d. Bottleneck

5. Special problem area such as medicine, finance, science or engineering that an expert can solve problems in very well.

a. inference engine

b. Knowledge domain

c. Problem domain

d. Knowledge base

Chapter 2 – Representation of Knowledge

1. The study of knowledge is epistemology. **True**/False

2. A Posteriori knowledge come before and is independent of knowledge from the senses while a Priori knowledge is the opposite of a posteriori knowledge which is knowledge derived from the senses.

True/**False**

3. Without relationship, knowledge is simply a collection of …….

a. related information

b. transform data into information

c. unrelated facts.

d. information

4. With relationship, knowledge is a cohesive structure about which other knowledge can be inferred.

True/False

5. The objects in a class have one or more …….. in common and each attribute has a ……..

a. Attributes, property

b. Property, value

c. Attributes, values

d. Superclass, Attributes

Chapter 3 – Methods of Inference

1. Chip using forward chaining can compute answers quickly as a function of its inputs because ……

a. Processing proceeds in parallel

b. Processing proceeds in series

c. it makes an appropriate response depending on its inputs

d. it can handle unexpected inputs

2. Premises is called …… while conclusion is called ……..

a. syllogism, warrant

b. Antecedent, argument

c. state, antecedent

d. antecedent, consequent

3. An argument is a group of statement in which the last is justified on the basis of the previous ones in the chain of reasoning. **True**/False

4. Inferring a conclusion based on the similarities to another situation is termed as

a. Deduction

b. Intuition

c. Analogy

d. Abduction

5. Inferring from the specific case to the general.

a. Deduction

b. Induction

c. Analogy

d. Abduction

CHAPTER 4 – Reasoning Under Uncertainty

1. Theories to deal with uncertainty include all except

a. Shannon Theory

b. Dempster-Shafer Theory

c. Markov Models

d. Procedural Theory

2. A certain event is assigned a probability one and an impossible event is assigned probability zero. **True**/False

3. The probability of an event *A* occurring, given that event *B* has already occurred is called

a. Conditional probability

b. Subjective probability

c. Experimental probability

4. A Markov chain process is defined as having the following characteristics except

a. a finite number of possible states.

b. The process can be in one and only one state at any one time.

c. The process moves or steps successively from one state to another over time.

d. The probability of a move depends on any preceding state.

5. Likelihood refers to repeatable events and probability refers to our degree of belief in nonrepeatable events. True**/False**

Chapter 5 – Inexact Reasoning

1. …… can be viewed as minimizing the local uncertainties whereas …… minimizes the global uncertainty of the entire expert system.

a. Verification, Validation

b. Validation, Verification

c. Verification, Reasoning

d. Antecedent, Consequent

2. Certainty factors are simple to implement where inference chains are short. **True**/False

3. Hypothesis is justified by …… and knowledge is justified by …….. that it is correct.

a. Heuristics, knowledge

b. Knowledge, wisdom

c. Knowledge, warrant

d. Acquisition, Application

4. "Heuristics" is a Greek word which means "to …… ".

a. Guess

b. Deduce

c. Discover

d. Assimilate

5. Besides dealing with uncertainty, fuzzy expert systems are also capable of modelling …….. which is very difficult for conventional system to do.

a. Commonsense Reasoning

b. Logical Reasoning

c. Commonsense Knowledge

d. Non - monotonic

EXPERT SYSTEMS ASSIGNMENT

NAME: AMOAH STEFAN ABABIO

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Chapter 1

1. Which of the following best describes MYCIN in early expert systems?
   a. Configuring computer systems
   b. Geological data analysis for minerals
   c. Geological data analysis for oil
   d. Medical diagnosis of illness
   Ans: d
2. The two main components of expert systems are knowledge base and _____
   a. Books
   b. Inference engine
   c. Magazines
   d. Knowledgeable persons
   Ans: b
3. Forward chaining is primarily_____ driven.

a. Goal
b. Event
c. System
d. Data
Ans: d

4. Backward chaining is primarily_____driven.
a. Goal
b. Event
c. System
d. Data
Ans: a

5. Procedural programs are also called_____
a. Apparent programs
b. Coded programs
c. Sequential programs
d. Declarative programming

Chapter 2

1. Which of the following best describes logical reasoning?
a. Formal way facts and rules of inferences are used to reach valid conclusions.
b. The process of reaching valid conclusions
c. The success of expert systems
d. The study of making inferences
Ans: b

2. _____ is the formal study of knowledge.
a. Nature
b. Philosophy
c. Epistemology
d. Argument
Ans: c

3. Sematic nets consist of nodes and _____
a. Objects
b. Concepts
c. Situations
d. Arcs
Ans: D

4. Venn diagrams can be used to represent_____
a. Knowledge
b. Elements
c. Reasoning
d. Expert systems
Ans: a

5. Automated reasoning refers to logic in the context of expert systems.
   a. True
   b. False
   Ans: A

Chapter 3

1. A tree is a hierarchical data structure consisting of nodes and _____.
   a. Roots
   b. Elements
   c. Branches
   d. Leaves
   Ans: C
2. Which of the following graphs have no cycles.
   a. Connected Grpahs
   b. Digraphs
   c. Lattice
   d. Acyclic Graphs
   Ans: D
3. A lattice is a directed _____ graph.
   a. Connected
   b. Digraph
   c. Lattice
   d. Acyclic
   Ans: D
4. What is the full meaning of FSM?
   a. Finite State Machine
   b. Finite Simple Machine
   c. Finite Solution Machine
   d. Finite States Machine
   Ans: A
5. Autoepistemic means previous knowledge
   a. True
   b. False

Chapter 4

1. Uncertainty is essentially lack of _____ to formulate a decision.
   a. Data
   b. Reasoning
   c. Common sense
   d. Information
   Ans: D
2. Which of the following best describes errors of precision?

a. Whether something is true or not
b. How well the truth is known
c. Result from bias
d. Random error
Ans: B

3. In which year was the classical probability proposed?
a. 1564
b. 1994
c. 1654
d. 1674
Ans: c

4. Uncertainty may be present in rules, evidence or both.
a. True
b. False
Ans: a

5. Systematic errors result from_____
a. Fluctuations
b. Bias
c. Accuracy
d. Errors
Ans: b

Chapter 5

1. Verification refers to minimizing the local _____
a. Answers
b. Values
c. Uncertainties
d. Assets
Ans: c
2. Validation refers to minimizing the _____uncertainties of the entire expert system.
a. Global
b. Common
c. Correct
d. Usual
Ans: a
3. The Dempster-Shafer Theory is a method of _____.
a. Probability
b. Experts
c. Forward Chaining
d. Inexact reasoning
Ans: D

4. According Dempster-Shafer an environment is called a frame of _____
   a. Values
   b. Elements
   c. Discernment
   d. Knowledge
   Ans: C
5. Fuzzy logic is a superset of _____ logic.
   a. Conventional
   b. Convertible
   c. Probabilistic
   d. Neural
   Ans: a

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1. A parse tree is a graphic representation of a sentence decomposed into all the terminals and non terminals used to derived the sentence.
   a) True
   b) False.
2. Semantic Networks is
   a) A way of representing knowledge
   b) Data Structure
   c) Data Type
   d) None of the mentioned
3. Following are the Semantic Relations used in Semantic Networks.
   a) Meronymy
   b) Holonymy
   c) Hyponymy
   d) All of the mentioned
4. Frames is
   a) A way of representing knowledge
   b) Data Structure
   c) Data Type
   d) None of the mentioned
5. Frames in artificial intelligence are derived from semantic nets.
   a) True
   b) False
6. Like semantic networks, frames can be queried using spreading activation.
   a) True
   b) False
7. Semantic Network represents
   a) Syntactic relation between concepts
   b) Semantic relations between concepts
   c) All of the mentioned
   d) None of the mentioned
8. Basic idea of an partitioned nets is to break network into spaces which consist of groups of nodes and arcs and regard each space as a node.

a) True
b) False

9. What among the following is/are the best example of semantic networks?
   a) Wordnet
   b) Human Food Chain
   c) MYSIN
   d) Autonomous car driver
10. What are the limitations of the semantic networks?
   a) Intractability
   b) Lack in expressing some of the properties
   c) Incomplete
   d) Has memory constraints
11. Which of the following is an advantage of using an expert system development tool?
   a) imposed structure

b) knowledge engineering assistance

c) rapid prototyping

d) all of the mentioned

12. An expert system is

a. a computer that can answer questions like a human expert

b. a group of scientists who design computer programs

c. a method of producing new words

d. a computer that can feel emotions.

13. The first widely-used commercial form of Artificial Intelligence (Al) is being used in many popular products like microwave ovens, automobiles and plug in circuit boards for desktop PCs. It allows machines to handle vague information with a deftness that mimics human intuition. What is the name of this Artificial Intelligence?

a) Boolean logic

b) Human logic

c) Fuzzy logic

d) Functional logic

14. Semantic Network is also known as Frame networks.
   a) True
   b) False

15. Here exists two ways to infer using semantic networks in which knowledge is represented as Frames.
   1) Intersection Search
   2) Inheritance Search

CHAPTER 252

a) True
b) False

16. Following are the elements, which constitutes to the frame structure.
a) Facts or Data
b) Procedures and default values
c) Frame names
d) Frame reference in hierarchy

17. Tacit knowledge is sometimes called _____?

18. What are Logic frames?

19. What are fuzzy nets?

20. What is the difference between neural network and fuzzy network?

21. List and define the major components of an ES.
22. What is the difference between knowledge acquisition and knowledge representation?
23. List three capabilities of ES.

Boakye Abigail Acheampong

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Expert Systems

Chapter one

1. An expert system uses?
a. Rules and procedures
b. Orders and law
c. Rules and inference
d. Heuristic

2. Is Expert system a category of AI?
True/False
3. What are the two classifications of programming paradigm
   a. Declarative and non-declarative
   b. Procedural and nonprocedural
   c. Logic and Object-Oriented

4. Give the types of procedural programming paradigm
   a. Declarative and non-declarative
   b. Logic and Object-Oriented
   c. Rule-based and Frame-Based
   d. Imperative and Functional
5. What is another name for expert system?
   a. Knowledge-based system

b. Heuristic
c. Problem domain
d. Facts

Chapter 2

6. What is the study of knowledge?

a. Priori

b. Posteriori

c. Tacit

d. Epistemology

7. What are the classifications of knowledge?

a. Procedural, nonprocedural and tacit

b. Procedural, declarative and tacit

c. Philosophic Theories, Procedural and nonprocedural

8. What is metaknowledge? ...

9. What are facts? ...

10. What is Grammar? ...

Chapter 3

11. What is a Binary tree?

a. One child per node

b. Two children per node

c. Three children per node

d. Four children per node

12. State space is the method of describing the behavior of an object

True/False

13. Write De Morgan's Law? ...

14. Acyclic graph has no

a. Parameters

b. Points

c. Cycles

d. Structure

15. Another definition of shallow knowledge is ...

Chapter 4

16. Uncertainty can be considered as the lack of adequate information to make a decision.

True/False

17. Ambiguity is when something may be interpreted in more than one way.

True/False

18. Reasoning about events that depend on time is called … and is something that humans do fairly easily?

a. Permanent reasoning

b. Temporal reasoning

c. Both of them

d. None of the above

19. A plausible means that more than a possibility exists

True/False

20. What is a Certain belief?

a. can be assumed

b. belief is true

c. belief is false

d. it cannot be predicted

Chapter 5

21. Probability can be considered as a theory of.

a. Inexact reasoning

b. Reproducible uncertainty

c. Trials and error

d. Many chances

CHAPTER 255

22. A relation is sometimes called?

a. Set

b. Angles

c. Mapping

d. Functions

23. An alternate method, called the moments method, assigns the truth of rule consequents in a way that is analogous to calculating the first moment of ……

24. What is the use of the slump test?

a. Is the mix correct/workable

b. For checking for weight

c. For checking for the constituents

d. For checking for quantity

25. The Center of gravity is also called ?.

a. Second momentum

b. First moment of inertia

c. Physical Force

d. Mass

EXPERT SYSTEMS ASSIGNMENT

NAME: Yeboah Joseph Atta

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Chapter 1

- Which of the following defines the key role of MYCIN in early expert systems?
    - Computer system assembly

- Geological data analysis for minerals
- geological data collection for oil
- Medical diagnosis of illness

  Ans: d

- The two main components of expert systems are knowledge base and _____
  - Books
  - Magazines
  - Knowledgeable persons
  - Inference engine

    Ans: d

- Forward chaining is _____ driven.
  - Goal
  - Data
  - Event
  - System

    Ans: b

- Backward chaining is _____driven.
  - Goal
  - Event
  - System
  - Data

    Ans: a

- Procedural programs are referred to as_____
  - Apparent programs
  - Coded programs
  - Sequential programs
  - Declarative programming

Chapter 2

CHAPTER 257

- Logical reasoning is defined as:?
    - Formal way facts and rules of inferences are used to reach valid conclusions.
    - The process of reaching valid conclusions
    - The success of expert systems
    - The study of making inferences

      Ans: b

- Venn diagrams can be used to represent_____
    - Elements
    - Knowledge
    - Expert systems
    - Reasoning

      Ans: b

- _____ is the formal study of knowledge.
    - Nature
    - Philosophy
    - Epistemology
    - Argument

      Ans: c

- _____ and nodes are part of semantic nets
    - Objects
    - Concepts
    - Arcs
    - Situations

      Ans: c

CHAPTER 258

- Automated reasoning refers to logic in the context of expert systems.
  - True
  - False

    Ans: A

Chapter 3

- A tree is made up of nodes and _____.

  a. Roots

  b. Elements

  c. Branches

  d. Leaves

  Ans: C

- An_____ graph is a lattice.
  - Connected
  - Digraph
  - Lattice
  - Acyclic

    Ans: D

- Which of the following graphs have no cycles.
  - Connected Grpahs
  - Digraphs
  - Lattice
  - Acyclic Graphs

    Ans: D
- What is the full meaning of FSM?
  - Finite State Machine
  - Finite Simple Machine
  - Finite Solution Machine

- Finite States Machine

  Ans: A

- Autoepistemic means previous knowledge
  - True
  - False

Chapter 4

- Systematic errors result from_____
  - Fluctuations
  - Bias
  - Accuracy
  - Errors

    Ans: b

- Uncertainty is essentially lack of _____ to formulate a decision.
  - Data
  - Reasoning
  - Common sense
  - Information

    Ans: D
- In which year was the classical probability proposed?
  - 1564
  - 1994
  - 1654
  - 1674

    Ans: c

- Uncertainty may be present in rules, evidence or both.
  - True

- False

  Ans: a

- Which of the following best describes errors of precision?
  - Whether something is true or not
  - How well the truth is known
  - Result from bias
  - Random error

    Ans: B

Chapter 5

- Fuzzy logic is a superset of _____ logic.
  - Conventional
  - Convertible
  - Probabilistic
  - Neural

    Ans: a

- Verification refers to minimizing the local _____
  - Answers
  - Values
  - Uncertainties
  - Assets

    Ans: c
- The Dempster-Shafer Theory is a method of _____.
  - Probability
  - Experts
  - Forward Chaining
  - Inexact reasoning

CHAPTER 261

Ans: D

- According Dempster-Shafer an environment is called a frame of _____
  - Values
  - Elements
  - Discernment
  - Knowledge

    Ans: C

- Validation refers to minimizing the _____uncertainties of the entire expert system.
  - Global
  - Common
  - Correct
  - Usual

    Ans: a

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COURSE: EXPERT SYSTEMS

CHAPTER 1

1. How do you call someone with expertise in a certain area?
   a. Informant **b. Expert** c. Expert System d. A.I
2. Who extracts unwritten knowledge from an expert to build an expert system
   a. Programmer b. Software Engineer **c. Knowledge Engineer** d. An Expert System expert
3. The stages involved in the development of an expert system are
   i. Knowledge Engineer ii. Expertise

   iii. Knowledge-Base of Expert System iv. Human Expert

   a. ii, iii and iv only b. i, ii and iii only **c. i, iii and iv only** d. All of the above

4. The DIPMETER expert system is to Geology as PROSPECTOR is to _____

   a. Computer Science **b. Minerals** c. Chemistry d. Organisms

5. The EURISKO expert system is used to
   a. Instruct circuit fault diagnosis
   b. Redesign digital circuits to new
   c. Diagnose national communication net

d. Design 3-D microelectronics

The categories of Epistemology are: i. A posteriori knowledge ii. Philosophic theories iii. A priori knowledge iv. Procedural knowledge

a. i, ii and iv only b. ii, iii and iv only **c. i, iii, and iv only** d. i, ii and iii only

2. At the knowledge pyramid which of the following is at the apex
   a. Data b. Knowledge **c. Wisdom** d. Information
3. The knowledge pyramid consists of the following:
   i. Information ii. Wisdom
   iii. Metaknowledge
   iv. Noise

   a. i, ii and iii only b. ii, iii and iv only c. i, iii and iv only

d. All of the above

4. How is information that is considered reliable called
   a. **Fact** b. Data c. Information d. Knowledge
5. _____ is a symbolic logic for manipulating propositions
   a. Statement calculus b. Sentential calculus c.

Propositional calculus d. Logical variables

A _____ is a hierarchical data structure consisting of _____, which store information or knowledges and _____, which connect the _____.

a. branches, nodes, tree, nodes b. tree, branches, nodes, nodes c. **tree, nodes, branches, nodes** d. nodes, branches, trees, nodes

2. _____ is a useful method of describing the behavior of an object is to define a graph

a. **State space** b. transition c. state d. finite state

3. _____ is a rule of thumb based on experience

a. Default b. Analogy **c. Heuristics** d. Nonmonotonic

4. The collection of objects such as rules, axioms, statements and so forth organised in a consistent manner is called _____

a. Theorems b. axioms **c. logic systems** d. assertions

5. A _____ is essentially finding chains of rules or inferences that connect a problem with a solution, or goal, with the evidence to support it a. Method b. test **c. plan** d. resolution

Which of the following are types of errors?

i. Ambiguous
ii. Random
iii. Systematic iv. Reasoning

a. i, ii and iii only b. ii, iii and iv only c. i, ii and iv only **d. All of the above**

2. Measurement errors can be further broken into

a. Inductive error and Deductive error b. Wrong Output and No Output
c. **Precision and Accuracy** d. False Negative and False Positive

3. An acceptance of a hypothesis when it is not true is call

a. **False positive** b. Wrong Output c. False Negative d. No output

4. _____ is the classic expert system that uses probabilistic reasoning.

a. **PROSPECTOR** b. MYCIN c. PROBABISTOR d. DENDRAL

5. Reasoning about events that depend on time is called temporal reasoning and is something that humans do fairly easily. a. **True** b. False

The type of probability that confirms a hypothesis based on some evidence is the _____

a. **Epistemic probability** b. certainty probability c. ordinary probability

d. Confirmatory probability

2. When the elements of an environment may be interpreted as possible answers, and only one answer is correct, it is called _____

a. **Frame of discernment** b. basic probability assignment (bpa)
c. evidence measure d. basic assignment

CHAPTER 265

3. _____ is the fundamental difference between Dempster-Shafer theory and probability theory.
   a. Desperation b. Evidence **c. Ignorance** d. degree of belief
4. Any belief that is not assigned to a specific subset is considered _____
   a. No belief b. Belief c. non-belief d. **Both a and c**
5. "The car is nice" is a fuzzy statement
   a. **True** b. False

NAME: SIMEON NORTEY

INDEX NUMBER:4709715

CHAPTER 1

1. The expert's knowledge about solving specific problems is called
   a. Research Domain
   b. Solution Domain
   c. Problem Domain
   d. Knowledge Domain
2. Is Problem Domain a superset of Knowledge Domain?
   a. True
   b. False
3. What is used in chemical mass spectroscopy to identify chemical constituents.
   a. Prospector
   b. Dipmeter
   c. Dendral
4. Mycin is not used in medical diagnosis of illness.
   a. True
   b. False
5. What is the reasoning in reverse from a hypothesis, potential conclusion to be proved to the facts that facts that support the hypothesis – best for diagnosis problems?
6. …… is used in geological data analysis for oil.
   a. PROSPECTOR
   b. MYCIN
   c. **DIPMETER**
   d. DENDRAL
7. …… is used in geological analysis for minerals.
   a. PROSPECTOR
   b. MYCIN
   c. DIPMETER
8. ……. is a prioritized list of rules created by the inference engine, whose patterns are

satisfied by facts or objects in working memory.

a. Agenda
b. Algorithm
c. Knowledge Acquisition Facility

9. …… refers to reasoning in reverse from a hypothesis, a potential conclusion to be proved to the facts that support the hypothesis --- best for diagnosis problems.
   a. Forward chaining
   b. Middle chaining
   c. **Backward chaining**
   d. Basic idea
10. A/an ……..is a computer system that emulates or acts in all respects with the decision making capabilities of a human expert.
    a. **Expert System**
    b. Knowledge System
    c. Robotics

CHAPTER 2

1. What is the study of making inference given a set of facts
   a. Logic
   b. Wisdom
   c. Semantics
   d. Statement
2. What refers to the meanings we to symbols
   a. Statement
   b. Logic
   c. Argument
   d. Semantics
3. Expert systems are designed for knowledge representation based on rules of logic called
   a. Statement
   b. Inferences
   c. Arguments
   d. Logic
4. What refers to the formal way facts and rules of inferences are used to reach valid conclutions.
   a. Argument
   b. Regulations
   c. Statements
   d. Logic
5. Uncertainty is not a category or epistemology?
   a. True

   b. False
6. What consists of nodes and arcs ?
   a. Semantic nets
   b. Ans
   c. Ontology
   d. Argument
7. …… is the met knowledge that describes everything known about the problem domain
   a. Ontology
   b. Semantic net
   c. ANS
   d. Argument
8. What is the meaning of OAV?
   a. Objective Async Value
   b. Object Attribute Value
   c. Object Attribution Value
   d. Object Allocation Value
9. Contingent Statement is a statement that is neither a tautology nor a contradiction
   a. True
   b. False
10. Wisdom is the study of making inferences given a set of facts?
   a. True
   b. False

CHAPTER 3

1. The hierarchical structure consisting of nodes and branches is called?
   a. Tree
   b. Structure
   c. Net
2. What type of tree has only a single pathway from the root to its one leaf?
   a. Binary tree
   b. Lean Tree
   c. Degenerate tree
3. What diagram describing the finite number of states of a machine?
   a. DNS
   b. FSM
   c. FGA
   d. FGM
4. In the types of Logic, Intuition is explained as no proven theory?
   a. True
   b. False
5. Default is also referred to as self knowledge
   a. True
   b. False

CHAPTER 268

6. Heuristics is explained as trial and error
    a. True
    b. False
7. Accurate Semantics is not a requirement of a Formal system
    a. True
    b. False
8. What is the meaning of Wffs in expert systems?
    a. Well Formulated Fractions
    b. Well Formulated formulas
    c. Well Formulated facts
9. A chain is a group of multiple inferences that connect a problem with its solution
    a. True
    b. False
10. …….. is a group of multiple inferences that connect a problem with its solution
    a. Connect
    b. Chain
    c. Inference net
    d. Hypothesis

CHAPTER 4

1. Logic system provides an advantage when dealing with
    a. Logic
    b. **Uncertainty**
    c. Humans
2. Which of the following deals with exact facts and exact conclusion
    a. Inductive reasoning
    b. Uncertainty
    c. Logic
    d. **Deductive reasoning**
3. Accepting a hypothesis when it is not true is
    a. **False positive**
    b. False negative
    c. Semantic nets
    d. Inductive reasoning
4. Inductive reasoning
    a. Deals with exact facts and exact conclusion
    b. **Support the conclusion but do not guarantee it**
    c. A form of declarative knowledge
    d. Using knowledge in beneficial way
5. Rejecting a hypothesis when it is true is

CHAPTER 269

a. False positive
b. **False negative**
c. Semantic nets
d. Inductive reasoning

6. When repeated trials give the exact same result, the system is
   a. Unreliable
   b. Deductive
   c. **Deterministic**
   d. Inaccurate
7. How well the truth is known is
   a. Error of accuracy
   b. Unreliability
   c. **Error of precision**
   d. Inductive reasoning

8. Random fluctuations are also termed as
   a. Systematic errors
   b. **Random error**
   c. False negative
   d. Error of precision
9. Compound probabilities can be expressed by
   a. **P(A∩B) = n(A∩B) / n(s)**
   b. LS = P(E|H) / P(E|H)
   c. P(H|e)
   d. Ln = p(E'|H) / P(E'|H')

10. Which type of belief is false
    a. Possible
    b. Probable
    c. **Impossible**
    d. Plausible

CHAPTER 5

1. Two of the following are not sources of uncertainty that expert systems operate in

   i. Conflict resolution ii. Knowledge base iii. Individual views

   iv. Incompatibility of rules

a. i and ii
b. ii and iii
c. iii and iv
d. i and iii

Answer **b**

2. The certainty factor, CF, is way of combining _____ and _____ into a single number. a. Belief and truth
b. Disbelief and falsehood
c. Belief and disbelief
d. Truth and falsehood

Answer **c**

3. The certainty factor can be used to rank _____ in order of importance. a. Truth
b. Belief
c. Evidence
d. Hypothesis

Answer **d**

4. In MYCIN, suppose another rule also concludes the same hypothesis, but with a different certainty factor, the certainty factor of rules concluding the same hypothesis are calculated from the _____.
a. Certainty function
b. Reduction function
c. Combining function
d. Attenuation function Answer **c**

5. A theory that attempts to model uncertainty by a range of probabilities rather a single probabilistic number is a. Dempster---Shafer
b. Propagation of Probabilities
c. Approximate Reasoning
d. Inference Nets

6. Evidential reasoning deals with information that is expected to be

a. uncertain, imprecise and occasionally inaccurate.
b. certain, precise and always accurate
c. imprecise and occasionally accurate
d. certain, precise and occasionally inaccurate. Answer **a**

7. Computing not based on classical two –valued logics which includes fuzzy logic, neural networks and probabilistic reasoning is known as
   a. Approximate Logic
   b. Soft Computing
   c. Hard computing
   d. Extended computing

8. Which principle defines how to extend the domain of a given crisp set function to include fuzzy sets.
   a. Approximate principle
   b. Extended principle
   c. Fuzzy set principle
   d. Crisp set principle Answer **b**

9. Translation rules specify how modified or composite propositions are generated from their elementary propositions. The correct order for category of rules are
   I. Modification rules
   II. Quantification rules
   III. Composition rules
   IV. Qualification rules
      a. I, III, II and IV
      b. I, II, III and IV
      c. IV, I, II, and III
      d. II, III, I, IV

10. Conditional, conjunctive, disjunctive fall under which category of translation rules. a. Modification rules
    b. Quantification rules
    c. Composition rules
    d. Qualification rules

CHAPTER 272