UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B.Tech (CSE-Cyber Law)   Semester – V

Subject (Course): Artificial Intelligence   Max. Marks   : 100
Course Code   : CSEG-315   Duration   : 3 Hrs
No. of page/s:2

Section A
[Short Answer Questions]
Attempt all 4 questions. Each question carries 05 marks.
[4*5= 20 M]

1. **Define the following: [1M each]**
   (a). Hedge   **(b).** Baye's Rule   **(c).** Overfitting   **(d).** Knowledge-based system
   (e). Logical Representation scheme

2. **(i). Give two examples each for the following: [2+2+1M]**
        (a). Supervised Backpropagation Network
        (b). Commercially available Expert Systems
   (ii). Give an example of an activation function

3. **Differentiate between: [2.5 + 2.5 M]**
        (a). Certainty and Uncertainty reasoning
        (b). Forward chaining and Backward chaining

4. **Answer the following: [1 M each]**
        (i). What is a 'frame'?
        (ii). A backpropagation network is also called………………….._____
        (iii). What is an Expert System Shell?
        (iv). Who did early neural network experiment on pigeons?
        (v). What is a WFF?

Section B
[Long Answer Questions]
(First 03 Questions (Q.No: 5 to 7) are compulsory. Q.No. 8 has internal choice. Each question carries 10 marks)
[4*10 = 40 M]

5. **(a).** What is the purpose of 'explanation sub system of an expert system'? Use an example to explain. **[5M]**

(b). Discuss any 3 salient features of Propositional logic. How is a 'compound proposition' different from a 'proposition'? **[3+2M]**

6. **(a).** Write a short note on Depth limited and Iterative Depth Search. **[5M]**
    (b). Differentiate between blind search and heuristic search **[5M]**

7. Describe in detail different knowledge representation schemes, bringing out advantages and limitations of each. **[10M]**

8. Briefly discuss significant developments in AI covering all major experiments. **[10M]**

Or

8. AI has its origin in various science and engineering branches? Discuss these branches of study. Also discuss atleast 4 applications of AI in daily life. **[10M]**

Section C
[Very Long (Essay) Answer Questions]
(Q.No. 9 and 10 have internal choice. Each carries 20 Marks)

[2*20=40M]

9. Draw neural network model? Discuss its working in detail covering all relevant terms? Compare with analogy of a biological neuron? Discuss similarities with emphasis on connectionism and parallelism **[20M]**

Or

9. Describe the following. Use neat illustrations to support your answers **[5M each]**
    (a). Supervised and Unsupervised Neural Networks
    (b). Feed forward and backpropagation neural network
    (c). Percepteron, Single layer feed-forward neural network, and Multi-layer feed-forward neural network.
    (d). Mean square error

10. **Differentiate between the following**: **[5M each]**
        (a). Boolean Logic and fuzzy logic
        (b). Crisp boundary and fuzzy boundary
        (c). Conventional Programming and Logic programming
        (d). Knowledge Engineering and Knowledge Acquisition

Or

10. Explain in detail fuzzy reasoning process? Discuss structure of a fuzzy rule. Discuss working of any appliance working on the principle of fuzzy logic? **[20M]**

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Section A
[Short Answer Questions]
Attempt all 4 questions. Each question carries 05 marks.

[4*5= 20 M]

1. **Define the following: [1 M each]**
    (a). Quantifier   **(b).** Fuzzy boundary **(c).** Epoch   **(d).** heuristic
    (e). Procedural Representation scheme

2. **(i). Give two examples of each [2+2+1 M]**
        (a). Unsupervised feedforward network
        (b). Expert System shells
    (ii). Give one example of AI programming language

3. **Differentiate between: [2.5 + 2.5 M]**
    (a). Monotonic and Non-Monotonic reasoning
    (b). Informed and Uninformed search

4. **Answer the following: [1 M each]**
    (a). Another name given to transfer function is _____
    (b). What is underfitting?
    (c). What is certainty theory?
    (d). FOPL stands for ………………….._____
    (e). Differentiate between knowledge-base and data-base.

Section B
[Long Answer Questions]
(First 03 Questions (Q.No: 5 to 7) are compulsory. Q.No. 8 has internal choice. Each question carries 10 marks)

[4*10 = 40 M]

5. **(a).** What is the purpose of a 'user interface' of an expert system? Discuss any 3 essential characteristics. **[3+2 M]**
   (b). Take an example to briefly explain how a logical formula is interpreted? **[5M]**

6. **(a).** Write short note on Hill Climbing search technique. **[5M]**
   (b). What is significance of game search in AI? **[5M]**

7. **(a).** Compare manual knowledge acquisition with automated knowledge acquisition. **[5M]**
   (b). How does an inference engine work? Use diagrammatic representation to explain. **[5M]**

8. **(a).** Discuss learnings from **(i).** Turing experiment **(ii).** Chinese Experiment. **[2.5+2.5 M]**
   (b). Write your views on origin of AI. **[5M]**

Or

8. Taking an example of your choice, discuss in detail any two applications of AI in daily life? **[10M]**

Section C
[Very Long (Essay) Answer Questions]
(Q.No. 9 and 10 have internal choice. Each carries 20 Marks)

[2*20=40M]

9. Draw neat illustration of a biological neuron? Discuss construction of an artificial neural network and compare its working with a biological neuron? Describe single layer and multilayer feed forward network? What do you mean by 'training of a network'? **[20M]**

Or

9. 'Neural Networks exhibit ability to learn and generalize'. Justify this statement. Use suitable examples to support your answer. **[20M]**

10. How does a fuzzy logic system work? Briefly explain using suitable example. Discuss steps in fuzzy reasoning process in detail? **[20M]**

Or

10. What is uncertain data? Discuss different methods to handle uncertain data and perform uncertainty reasoning? Explain any two methods in detail. **[20M]**

end of question paper