B.E. (Computer Engineering) Eighth Semester (C.B.S.)
Elective-IV: Expert System Design

P. Pages : 2

Time : Three Hours

NRT/KS/19/3716

Max. Marks : 80

0811

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What is expert system? Write different applications and characteristics of expert system. **7**

   b) What is expert system shell? Also explain concept of expert system tools. **7**

OR

2. a) Draw an architecture of Rule based expert system and also explain its components. **7**

   b) Write a brief note on **7**
   i) DENDRAL ii) MYCIN
   iii) Knowledge engineer

3. a) Convert the following sentences into predicate logic. **8**
   i) Not all students take both history and biology.
   ii) Only one student failed in history.
   iii) Abhi failed in history.
   iv) Everyone who loves all animals in loved by someone.

   b) First and explain inference Rules. **6**

OR

4. a) Explain pressure normal form with example Also explain Skolemization. **7**

   b) Check whether the following formula's are tautology or not. **7**

   i) $(P \rightarrow (Q \rightarrow (Q \rightarrow P)))$

   ii) $(P \vee \neg P) \rightarrow (P \wedge \neg P)$

5. a) Draw and explain global architecture of production system. Also explain Top down and Bottom - up inference in brief. **8**

   b) Explain pattern recognition with example. **5**

OR

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6. a) What is certainty factor explain in brief.   6

    b) What is production system? Explain single valued variables and multi-valued variables   7
        with example.

7. a) Write a note on tree like taxonomy.   7

    b) What is frame? Explain its syntax with example.   6

OR

8. a) Explain extended schematic net with example.   5

    b) Consider following two frames convert these into semantic net and first order logic   8
            Class automobile is
            Superclass nil;
            Wheels = 4;
            Seats = 4
        end
            instance Rolls - Royce is
            instance of automobile;
            Max-velocity = enough
        end

9. a) Write and explain syntax of production rule with example.   6

    b) What is inference network? draw inference n/w for following.   7
        R_1 : if a and (b or c) then h fi

        R_2 : if d and f then b fi

        R_3 : if f or g then h fi

        R_4 : if a then d fi

OR

10. a) Explain different combination functions with example.   7

    b) Write a note on probability theory.   6

11. a) Write a detailed note on supervised learning with example.   7

    b) Write a brief note on neural network learning.   6

OR

12. a) Differentiate between single layer perceptron and multilayer perceptron.   8

    b) Explain with neat sketch iterative gradient algorithm.   5

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