

- (f) Differentiate supervised and unsupervised learning.
- (g) Name the functions used to add the data in knowledge base in Prolog with example.
- (h) Discuss the structure of Prolog program.

#### UNIT - I

- 2. Differentiate blind search and heuristic search. When does blind search become better than heuristic search? Also discuss the properties of heuristic search algorithms.
- 3. Why is it important that an expert system be able to explain the why and how question related to problem solving? Discuss the role of inference engine in expert system to solve the problem.

#### UNIT - II

- 4. How ESDLC is related with software engineering? Why prototype construction and formalization are important phases in ESDLC. Explain.
- 5. What is Truth Maintenance System? Explain its different types and how TMS is used to deal the uncertainty of knowledge.

#### UNIT - III

- 6. What are the differences between biological and artificial neurons? What is the role of back propagation network in ANN? Discuss with an example.

- 7. (a) What is fuzzy set? What is the membership function of a fuzzy set? Can a fuzzy membership be TRUE and FALSE at the same time? Illustrate with example.
- (b) Discuss the inference process for fuzzy expert system.

#### UNIT - IV

- 8. What is matching? Discuss the role of Backtracking in matching. How fail and cut predicates are used in backtracking? Give example also.
- 9. Explain with examples :
  - (a) Compound object
  - (b) Recursion
  - (c) Dynamic database
  - (d) Types and components of list

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**B.Tech. 2nd Semester F-Scheme  
(Common for All Branches) Examination,**

**May-2019**

**MATHEMATICS-II**

**Paper-Math-102-F**

*Time allowed : 3 hours*

*[Maximum marks : 100*

*Note : Attempt five questions in total selecting one question  
from each section. Question No. 1 is compulsory.*

1. (a) Give physical interpretation of gradient and divergence.
- (b) Solve  $(D^2 + 4)y = \cos 2x$ .
- (c) find the Laplace transform of  $e^{-3t} \cos^2 t$ .
- (d) Form the partial differential equation by eliminating the function  $f$  from the relation

$$z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$$

**Section-A**

2. (a) Find the values of constants  $a$ ,  $b$  and  $c$  so that the maximum value of the directional derivative of :

$$\phi = axy^2 + 6yz + cz^2 x^3 \text{ at } (1, 2, -1)$$

has a magnitude 64 in the direction parallel to  $z$ -axis.