

K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai
(An Autonomous Institute Affiliated to the University of Mumbai)

End Semester Exam

March 2022

M.Tech. (Artificial Intelligence)

Examination: FY- Semester II

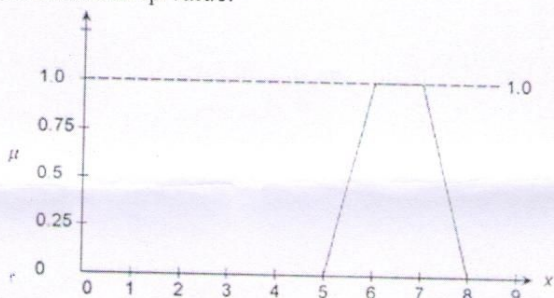
Course Code: IPCEC101 and Course Name: Building Blocks of Artificial Intelligence

Duration: 03 Hours

Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Ques. No.	Question	Max. Marks	CO	BT Level
Q1.	Solve any six questions out of eight:	12		
i)	Explain State Space Search.	2	CO1	U
ii)	Explain Soft Computing and Hard Computing.	2	CO2	U
iii)	Explain why weights are modified in Neural Networks.	2	CO3	U
iv)	Design a suitable Neural Network for diabetes prediction.	2	CO3	U
v)	Explain Tournament Selection method of Genetic Algorithms.	2	CO4	U
vi)	Explain Genetic Algorithm components using examples.	2	CO4	U
vii)	Explain Trapezoidal Membership Function	2	CO5	U
viii)	Explain Hybrid Soft Computing Systems.	2	CO5	U
Q2.	Solve any four questions out of six:	16		
i)	Explain any four application areas of Artificial Intelligence in detail.	4	CO1	U
ii)	Differentiate Supervised and Unsupervised Learning.	4	CO2	U
iii)	Explain how neural network topology is designed.	4	CO3	U
iv)	Explain the working principle of Genetic Algorithms and elaborate the process using a flowchart.	4	CO4	U
v)	Explain and apply any defuzzification method on the below membership function to obtain the crisp value: 	4	CO5	A
vi)	Explain Travelling Salesman Problem and role of GA in solving it.	4	CO4	U
Q3.	Solve any two questions out of three:	16		
i)	Explain Breadth-First Search technique using a suitable example.	8	CO1	U
ii)	For the below use cases, state whether to use supervised or unsupervised learning algorithm and justify it: a. Segmenting banking customers on whether or not they will default on a loan based on the records of previous customers b. Identifying trending topics by grouping customers mentioning the same keywords in social-media data	8	CO2	AN

iii)	Explain Backpropagation algorithm in detail.	8	CO3	U
Q4.	Solve any two questions out of three:	16		
i)	Consider the problem of maximizing the function $f(x) = x^2$ where x is permitted to vary between 0 to 31. Solve the example using Genetic Algorithm and demonstrate the best offspring after the first generation.	8	CO4	A
ii)	Explain Max-Min Composition using a suitable example.	8	CO5	A
iii)	Analyze a suitable soft computing method and apply it to solve Travelling Salesman Problem.	8	CO4	AN
