APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Scheme for Valuation/Answer Key
Scheme of evaluation (marks in brackets) and answers of problems/key
EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019
Course Code: CS464
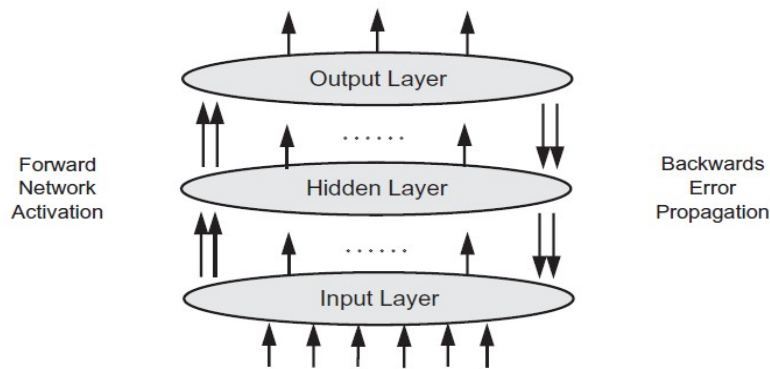**Course Name: ARTIFICIAL INTELLIGENCE**

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 4 marks.   Marks

1	Explanation of the history of Artificial Intelligence.	(4)
2	Mention Components of 8 puzzle Problem: Initial State, Goal state, Operators : 2 marks	(4)
	Example = 2 marks	
3	Illustration for under estimation – 2marks	(4)
	Illustration for over estimation – 2marks	
	Under estimation leads to selection of a bad node, Over estimation leads to ignoring a good node.	
4	Mention any 8 categories: ATRANS, PTRANS, PROPEL, MOVE, GRASP, INGEST, EXPEL, MTRANS, MBUILD, SPEAK, ATTEND	(4)
5	explanation	(4)
6	Explanation	(4)
7		(4)

Forward Network Activation — Output Layer — Hidden Layer — Input Layer — Backwards Error Propagation

$$f(net) = 1/(1 + e^{-\lambda * net}), \text{ where } net = \Sigma x_i w_i.$$

8   First, the individual potential solutions of the problem domain are encoded into   (4)
representations that support the necessary variation and selection operations;
often, these representations are as simple as bit strings. In the second stage,

mating and mutation algorithms produce a new generation of individuals that recombine features of their parents. Finally, a *fitness* function judges which individuals are the "best" life forms, that is, most appropriate for the eventual solution of the problem. These individuals are favored in survival and reproduction, shaping the next generation of potential solutions. Eventually, a generation of individuals will be interpreted back to the original problem domain as solutions for the problem.

9		Basic Concepts Only	(4)
10		Brief Concepts Only	(4)

PART B
Answer any two full questions, each carries 9 marks.

11	a)	Control strategies used to prepare production system.	(4)
	b)	Definition of the component of 8 puzzle problem with suitable example.	(5)
12	a)	Expressing the problem in terms of constraints – 1 mark	(5)
		Solving crypt arithmetic problem – 4 marks	
		Values possible A=1, T=9,P=0,E=8,H=2,A=1,L=3	
	b)	Suitable heuristic search with proper explanation	(4)
13	a)	With reason suitable method	(4.5)
	b)	Listing the differences	(4.5)

PART C
Answer any two full questions, each carries 9 marks.

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14	a)	Translate each sentence into conceptual dependency: 1 mark each for correct translation	(4)
	b)	Symbol-Based Learning with the concept "Arch"	(5)
15	a)	Move D except the value of 8 at node W	(9)
		MINIMAX algorithm	
16	a)	Explanation	(4.5)
	b)	Explanation	(4.5)

PART D
Answer any two full questions, each carries 12 marks.
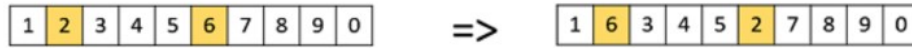
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17	a)	***Marks may be given for giving atleast the basic concepts***	(6)
		Mutation is defined as a small random tweak in the chromosome to get a new solution.	

Bit flip mutation
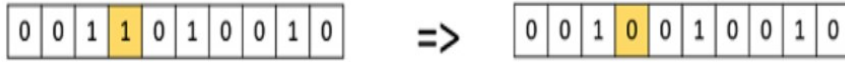
Random resetting: is an extension of the bit flip for the integer representation. A random value from the set of permissible values is assigned to a randomly chosen gene.
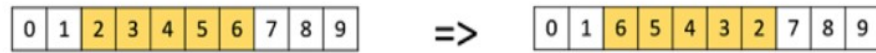
b) Swap mutation (6)

Scramble mutation
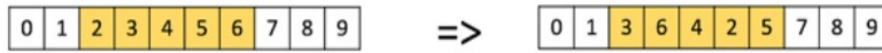
Inversion mutation

18 a) Basic Concepts only needed (6)

Output with identified tags as He/pronoun, went/verb in past, to/to connector, school/noun(6)

b) Basic Concepts Only .PCFG definition(3) explanation(1) example(2) (6)

19 a) Basic Concepts Only . (6)

b) Definition (3) output: [She, go, for dance, with ,her ,sister](3) (6)

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