National University of Computer and Emerging Sciences, Lahore Campus

	Course:	Artificial Intelligence	Course Code:	CS401
	Program:	BS(Computer Science)	Semester:	Fall 2016
	Duration:	30 min	Total Marks:	
	Paper Date:	09-02-17	Weight	%
	Section:	E	Page(s):	
	Exam:	Quiz 1	Reg. No	

Instruction/Notes:

Question 1: (5 marks)
Consider a pizza making Agent that makes a pizza from scratch
What are PEAS of this agent? (Performance Measure, Environment, Actuators, Sensors)
P= Quality of Pizza, time taken to make one pizza, power consumption
E: Whole machine, workspace to make pizza.
A= Oven, Motors to kneed and roll dough, add toppings, place pizza in oven.
S: Heat sensors, time sensors

Question 2: (10 marks)
Consider the TOWER of HANOI problem with 2 disks. Shown in figure 1.
The Tower of Hanoi puzzle involves moving a pile of different size disks from one peg to another using an intermediate peg. Initially all the disks are on left hand peg in order of their size (largest on bottom and smallest on top). The task is to move all the disks to Right most peg using an intermediate peg. You can move a ring from one peg to any other peg. However, only one disk at a time can be moved, a disk can only be moved if it is the top disk on a pile, and a larger disk can never be placed on a smaller one.
Create a complete state space (in form of graph) for this problem. But first you have to identify the actions. Then identify the path from initial to final state in your state space.

Figure 1 Tower on Hanoi

Question 3: (5 marks)
Consider the following state n of Sudoku cube, what is the h(n), according to the heuristic you have used in your assignment. Goal state is also given.
Give brief description of your heuristic first, in 2 lines. Is your heuristic admissible?

State n

Goal State

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Initial State

A B C

Actions :-
Move top disk
  from A to B
  from A to C
  from B to A
  from B to C
  from C to A
  from C to B

Action to Goal
A to B
A to C
B to C