**Dept. of Computer Engineering**
**First Exam, First Semester: 2012/2013**

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| **Course Title:** Intelligent System Design + Machine Intelligence | Date: 13/11/2012 |
| **Course No:** (630423+640424) | Time Allowed: 1 Hour |
| **Lecturer:** Dr. Mohammed Mahdi | No. of Pages: 1 |

### *Question 1:*                                                                     *(2 Marks)*

**Objectives: This question is about the basic concepts of expert systems.**

## Choose the right answer: -

1. **Data base of expert system includes:- (**1 Mark**)**

   a) **Set of facts.**
   b) **Set of dynamic goals.**
   c) **Both above.**

2. **Fuzzy sets of input signals in fuzzy logic system should be: - (**1 Mark**)**

   a) **Symmetric.**
   b) **Non-symmetric.**
   c) **Depends on the signal features.**

### *Question 2:*                                                                     *(9 Marks)*

**Objectives: This question is about expert system and FL.**

A) **Sketch the general layout of an Expert System. Define each of its blocks.** (3 Marks)

B) **Define the following terms: - Knowledge, Domain Expert, Fuzzy set.** (3 Marks)

C) **State what expert system rules can represent.** (3 Marks)

### *Question 3:*                                                                     *(9 Marks)*

**Objectives: This question is about rules techniques and fuzzifier design.**

A) **Given the following set of rules: -**
   R1: A & B $\rightarrow$ C
   R2: D & E & F $\rightarrow$ A
   R3: G $\rightarrow$ D

**It is required to apply Forward Chaining technique. Then state only the main difference between forward and backward chaining.** (6 Marks)

B) **It is required to design a fuzzifier element that receives a crisp input signal between - 20 to +20 of 11-quantized levels described by 5-fuzzy sets named as Negative Big (NB), Negative Small (NS), Zero (Z), Positive Small (PS), Positive Big (PB).** (3 Marks)