**INSTITUTE ENGINEERING AND TECHNOLOGY, GREATER NOIDA**

**Assignment #2**

**SUBJECT: Discrete Structure BRANCH: AIML**

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|  | **Show that the set ‘N’ is a monoid with respect to multiplication.** | **CO2** |
| **2.** | **Let (Z, \*) be an algebraic structure, where Z is the set of integers and the operation \* is defined by n \* m = maximum of (n, m). Show that (Z, \*) is a semi group. Is (Z, \*) a monoid ? Justify your answer.** | **CO2** |
| **3.** | **Show that the set of all strings ‘S’ is a monoid under the operation ‘concatenation of strings’. Is S a group w.r.t the above operation? Justify your answer.** | **CO2** |
| **4.** | **Show that the set of all positive rational numbers forms an abelian group under the composition \* defined by a \* b = (ab)/2.** | **CO2** |
| **5.** | **Show that G = {1, -1} is an abelian group under multiplication.** | **CO2** |
| **6.** | **Show that G = {1, w, w2} is an abelian group under multiplication. Where 1, w, w2 are cube roots of unity.** | **CO2** |
| **7.** | **Show that G = {1, –1, i, –i } is an abelian group under multiplication.** | **CO2** |
| **8.** | **The set G = {0,1,2,3,4,5} is a group with respect to addition modulo 6.** | **CO2** |
| **9.** | **The set G = {1,2,3,4,5,6} is a group with respect to multiplication modulo 7.** | **CO2** |
| **10.** | **Show that the union of two sub groups of a group G need not be a sub group of G.** | **CO2** |