Of for Back Exam
04 Students
21/3/17

DOON UNIVERSITY,
DEHRADUN
Mid Semester Examination, 2016-17
School of Technology

Integrated M.C.A. (Semester II)
Course: STM – 511 Mathematics II

Time Allowed: 2Hours *Maximum Marks: 30*

SECTION A

Attempt any 6 of the following **(6×1=6 Marks)**

1. Define the term Poset.
2. What is a distributive lattice?
3. What is the cardinality of any set?
4. Define the term GLB with an example.
5. Find $A \times B$ if $A=\{a, 1\}$ and $B=\{1, a\}$.
6. What is a one to one function?
7. Define the power set of any set.

SECTION B

Attempt any 4 questions **(4×3=12 Marks)**

8. Prove that $(A \cap B) \times (C \cap D) = (A \times C) \cap (B \times D)$.
9. Draw the Hasse diagram of the divisors of 18 ordered by divides.
10. What is antisymmetry? Explain with an example.
11. Represent the relation $R=\{(1,1), (1,2), (1,4), (2,3), (2,4), (3,2), (3,4), (4,4)\}$ defined on $A=\{1,2,3,4\}$ by relation matrix and relation graph. Is R reflexive?
12. What properties are possessed by the function $f : R \rightarrow R$, $f(x)=x^3+x$. Draw the function appropriately.

SECTION C

Attempt any 2 questions **(2×6=12 Marks)**

13. In a software company 71% programmers know Java, 64% programmers know C++ and 59% programmers know C language. 30% programmers know both Java and C, 33% programmers know both C and C++ and 36% programmers know both C++ and Java. How many programmers know all the three languages?

14. Let $A=\{a,\phi\}$ and $B=\{\phi,\{\phi\}\}$. Find $A\cup B, A\cap B$ and $A\times B$. Write down all the subsets of $A\times B$. How many binary relations can be defined from A to B?

15. Verify that (P(A), R) is a lattice if $A=\{p, q\}$, P(A) is the power set of A and $R=\{(a, b) \mid a\subseteq b\}$. Draw the lattice appropriately.

(End of the Paper)