Code: R7210502

R07

B.Tech II Year I Semester (R07) Supplementary Examinations, May 2013
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(Common to CSE, IT and CSS)

Time: 3 hours   Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1 (a) State and explain the law of duality.
   (b) Define proposition. Express the following statement in symbolic form using the propositions given below:
         A: Ram is a hockey player.
         B: Ram is a hard worker.
         C: Ram is a physician.
   "Ram is either hard worker or a hockey player but not both".

2 (a) Prove the statement: "The square of an even integer in an even integer" by the method of contradiction.
   (b) Define argument. Explain the rules of inference in detail.

3 (a) What is a distributive lattice? Explain the steps involved in solving a distributive lattice.
   (b) State pigeon hole principle. Explain its properties.

4 (a) Prove that the intersection of two submonoids of a monoid is a monoid.
   (b) Explain the general properties of an algebraic system.

5 (a) Find the total number of positive integers that can be formed using the digits $0, 2, 5, 6, 8$ with no repetitions.
   (b) State and prove binomial multinomial theorem.

6 (a) Explain homogeneous recurrence relation taking an example.
   (b) Write the general form of the solution to $a_n - 8a_{n-1} + 11a_{n-2} = 0$.

7   What do you mean by traversal? Explain different types of tree traversals with a suitable example for each.

8 (a) State and prove Euler's formula.
   (b) How many different Hamiltonian cycles are there in K_n, a complete graph on n vertices?

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