

Code: 9A05301

R09

B.Tech II Year I Semester (R09) Supplementary Examinations, May 2013

**MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE**

(Common to CSS, IT and CSE)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 Which of the following proposition are true and which are false? Give reasons:
  - (a) If the earth is round then the earth travels round the sun.
  - (b) If Alexander Graham Bell invented telephone, then tigers have wings.
  - (c) If tigers have wings, then RDX is dangerous.
- 2 With reference to automatic theorem proving, show that SVR is tautologically implied by  $(p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow s)$ .
- 3 (a) Consider  $F : Z_+ \rightarrow Z_+$  define by  $f(a) = a^2$  check if  $f$  is one – to-one and in- to using suitable explanation.  
(b) Let the function  $f$  &  $g$  are defined by  $f(x) = 2x + 1$  and  $g(x) = x^2 - 2$  is  $f \circ g = g \circ f$ .
- 4 If  $(G, *)$  and  $(H, \Delta)$  are two groups and  $f: G \rightarrow H$  is Homomorphism, then prove that kernel is a normal function.
- 5 Find the recurrence relation for generating Fibonacci series and solve the relation.
- 6 (a) How many ways can we get a sum of 8 when two indistinguishable dice are rolled?  
(b) What is the coefficient of  $x^3y^7$  in  $(x+y)^{10}$ ?
- 7 (a) Explain the properties of path matrix.  
(b) What do you mean by graph traversal? Explain the different graph traversal techniques with an example.
- 8 Define the following with an example:
  - (i) Cycle graph.      (ii) Path graph.
  - (iii) Null graph.      (iv) Sub graph.
  - (v) Tree.

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