Code: 9A05301

R09

B.Tech II Year I Semester (R09) Supplementary Examinations June 2016
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(Common to CSS, IT & CSE)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) Show that ~ (p v (~ p ^ q)) and ~ p ^ ~ q are logically equivalent .
   (b) Check whether the following are well formed formulae or not.
        (i) ~ (p ^ q).   (ii). ~ p v q .

2 (a) How the validity of an argument can be checked by using truth table? Give an example.
   (b) Show that r v s follows logically from premises:
        c v d , (c v d) → ~ b, ~b → (a ^ ~b) and (a ^ ~b) → r v s.

3 (a) What is a function? State the types of functions.
   (b) What is an inverse function? Explain with an example.
   (c) If b : A → B and g : B → C are Bijective functions then (g o f)$^{-1}$ = $f^{-1}og^{-1}$.

4 (a) Prove that "Every cyclic is abelian, but the converse is not true".
   (b) Find the product of two permutations and show that it is not commutative.
        $$f = \begin{vmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \end{vmatrix} \qquad g = \begin{vmatrix} 1 & 2 & 3 & 4 \\ 3 & 2 & 1 & 4 \end{vmatrix}$$

5   Solve the recurrence relation $a_n - 7a_{n-1} + 10a_{n-2} = 7.3^n + 4^n$.

6 (a) How many three digit numbers are there which are even and have no repeated digits?
   (b) Find the number of arrangement of the letters of MISSISSIPPI.

7 (a) Find the chromatic number of a graph with only n- isolated vertices.
   (b) Let G be graph with 11 or more vertices. Show that G is non-planar.

8 (a) Give an example of a regular, connected graph of 6 vertices, which is not complete.
   (b) Prove that C_5 is the only cycle graph isomorphic to its complement.

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