ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : OCTOBER 2009

REGULATIONS – 2007

FOURTH SEMESTER

070030014 – DISCRETE MATHEMATICS

(COMMON TO CSE / IT)

TIME: 3 Hours Max.Marks : 100

PART- A

(20 x 2 = 40 Marks)

ANSWER ALL QUESTIONS

1. Define conjunction.
2. Define disjunction.
3. Define P_{dnf} and P_{cnf}.
4. Explain Maxterms
5. Write about free and bound variables.
6. Explain Minterms .
7. Construct the truth table for $P \vee Q$.
8. Define universal quantifiers.
9. Define Existential quantifiers
10. Define Universal Specifications.
11. Defien poset.
12. Write the laws of distributive lattice.
13. Define primitive recursive function.
14. Define Boolean algebra.
15. What is meant by circular permutation?
16. How many words can be formed using the letters of "FLOWER".
17. Define cyclic group

18. Define semi group.
19. What is meant by Order of the group?
20. Define subgroups.

PART- B

(5 x 12 = 60 Marks)

ANSWER ANY FIVE QUESTIONS

21. Obtain sum-of-products canonical form for $(P \wedge Q) \vee (\sim P \wedge R)$ and hence obtain product-of-sums canonical form for the above.

22. Define Tautology and Contradiction. Show That $(P \wedge Q) \leftrightarrow (P \vee Q)$ is a tautology.

23 Define Universal quantifiers and existential quantifiers. Over the Universe of books define the propositions:

B(x) : x has a blue cover.

M(x) : x is a Mathematics Book

U(x) : x is Published in USA

R(x,y) : The bibliography of x includes y

Translate the following into words:

(i) $(\exists x)(\sim B(x))$

(ii) $(\forall x)(M(x) \wedge U(x)) \rightarrow B(x)$

(iii) $(\exists x)(M(x) \wedge \sim B(x))$

(iv) $(\exists y)((\forall x)(M(x) \rightarrow R(x,y)))$

24 (i) Explain Hasse diagram (4)

(ii) Let A be a given finite set and ρ(A) its power set. Let ⊆ be the inclusion relation On the elements of ρ (A). Draw the Hasse diagram of (ρ(A) ,⊆) for A = {a, b ,c}. (8)

25. (i) Define Lattice. (4)

(ii) Write short notes on complemented lattice and lattice homomorphism. (8)

26. State and prove Lagrange's theorem of groups.

27. Prove that any two right (or left) cosets of H in G are either disjoint or identical.

28. Find $g \circ f, f \circ f, g \circ g$ when $f : R \to R$ and $g : R \to R$, $f(x) = x^2 + 3x + 1$ and $g(x) = 2x - 3$

******THE END******