

M.C.A. DEGREE EXAMINATION, MAY – 2015

First Year

Paper - VIII : DISCRETE MATHEMATICS

Time : 3 Hours

Maximum Marks: 75

SECTION - A

Answer any THREE questions

(3×15 = 45)

- 1) a) Prove that $[(p \wedge \sim q)] \rightarrow n [p \rightarrow (q \vee n)]$ is a tautology.
- b) State all rules for logical Inference.
- 2) a) Let $f(x) = x+2$, $g(x) = x - 2$ and $h(x) = 3x$ for $x \in \mathbb{R}$ where \mathbb{R} is the set of real numbers. Find fog, gof, gog, foh, hog, hof and fohog.
- b) Symbolize the following argument and check for its validity
- All men are fallible
All kings are men
Therefore, all kings are fallible.
- 3) a) Find Recurrence Relation satisfying
- $$Y_n = A(3)^n + B(-4)^n$$
- b) Write a brief note on Recursive Algorithms.
- 4) Make logic circuits for the following Boolean Expressions
- a) $A' B + ABC + C' + B'$
- b) $\overline{wyz} + wz + \bar{y} z + xyz$
- 5) a) Explain the following.
- i) Planar Graph
- ii) Hamilton Graph

- b) Explain Travelling salesman problem.

SECTION – B

(5×5 =25)

Answer any FIVE questions

- 6) Prove that the following IS in tautology
$$\left[p (p \rightarrow r) \wedge (q \rightarrow r) \right] \rightarrow [p \vee q \rightarrow r]$$
- 7) Show that $(x) (P(x) \vee Q(x)) \Rightarrow (x) P(x) \vee (\exists x) Q(x)$.
- 8) Explain Recurrence Relation.
- 9) Define homogenous Recurrence relation.
- 10) What is ‘‘Monoid of the Machine’’.
- 11) Define and explain Adjacency Matrix.
- 12) What is Recursive Sub routine.
- 13) Explain Isomorphic graph.

SECTION-C

(5×1 = 5)

Answer ALL questions

- 14) Define Tautology.
- 15) Define Recursion.
- 16) Define Hasse Diagram.
- 17) Define bipartite Graph.
- 18) Define Ackerman’s function.

