

ANNAI VIOLET ARTS AND SCIENCE COLLEGE
DEPARTMENT OF MATHEMATICS

CONTINUOUS INTERNAL ASSESSMENT – I (ODD SEM.)
SUBJECT : DISCRETE MATHEMATICS

Prepared by
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Class : III B.Sc (MATHS)

Date : 05.09.2022-FN

Max.Marks : 50

Sub. Code:

PART A ($5 \times 2 = 10$ Marks)

Answer any FIVE questions

1. What is mean by subset.
2. Compute the gcd of 42823 and 6409.
3. Describe Boolean algebra.
4. Mention CNF.
5. Transform the following CNF into DNF $(x'+y)(x+y')$.
6. Define simpler circuit.
7. Construct and sketch the simpler circuit for the following $xy+y'(x+z)$.

PART B – ($2 \times 5 = 10$ Marks)

Answer any TWO questions

8. State and prove Division algorithm.
9. Show that a complete CNF is identically zero.
10. Prepare a switching table and sketch the switching circuit for the following (a) $(xy'+x'yz+x'z')$ (b) $xy+z(xy'+x'y)$.

PART C – ($3 \times 10 = 30$ Marks)

Answer ALL questions

11. Establish that if m and n are two positive integers an $m=qn+r$, with $0 \leq r < n$, then $\gcd(m,n)=\gcd(n,r)$.
12. Express the following Boolean expression in DNF (a) $x_1x_2+x_1$
(b) $(x_1x_2')+(x_1+x_2)$ (c) $1+x_2'x_1'$ (d) $(x_1x_2)(x_1'+x_2)(x_1+x_2')$
13. Let $f:B^n \rightarrow B$ be a function such that $f \neq 0$. Then there exists a Boolean expression α in DNF such that $f(b_1, b_2, \dots, b_n)=\alpha(b_1, b_2, \dots, b_n)$ for all $(b_1, b_2, \dots, b_n) \in B^n$.