



THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

MAT/MAS 3542

APPLIED BOOLEAN ALGEBRA

MARKS: 75

TIME: 3HRS

ANSWER ANY FIVE QUESTIONS:

5×15=75

- (a) Multiply: (i) $(563.021)_8$ by $(35.21)_8$ (ii) $(3a1b.0c4)_{16} \times (c2.5f)_{16}$
(b) Divide the binary number $(10100101.11)_2$ by $(110.1)_2$.
- Explain Gray code and generate it from 0 to 15.
- State and Prove Shannon's expansion theorem and determine canonical sum of product for the Boolean expression $f(x, y, z) = x + y'z'$
- (a) Generate Hamming code from 0 to 9.
(b) Prove that in a self-complementing code the sum of the weights must be 9.
- Construct truth table for the following:
(i) $(x + y)' = x'y'$ (ii) $(x \cdot y)' = x' + y'$ (iii) $x \cdot (y + z) = x \cdot y + x \cdot z$
- Draw a switching circuit for the following expressions:
(i) $f(x, y, z) = xy + x'yz' + xy'z$
(ii) $f(x, y, z) = (x + y + z')(x' + y)(x + y' + z')$.
- Simplify the following Boolean expression using karnaugh map method:
 $F(w, x, y, z) = \sum(0,1,2,7,9,11,12,13)$
