

# Achhruram Memorial College

Affiliated to Sidho-Kanho-Birsha University

## Digital Electronics Examination

Date: 13-11-2017

Time: 10:30PM – 12.30PM

Full Marks: 50

All Questions are compulsory:

- (1) Convert  $(726)_8$  into its binary equivalent. 2
- (2) Convert the hexadecimal number  $(2A3.A)_{16}$  into its decimal equivalent. 2
- (3) Convert the decimal number 2478 to a hexadecimal number. Convert the hexadecimal number C5E2 to a binary number? 2
- (4) Convert the hexadecimal number 2F1.9F to a binary one and decimal one. 2
- (5) Perform the binary addition  $11111+1011+101+10+1$ . Also show the corresponding decimal addition. 2+2
- (6) A three variable truth table has high output for these input conditions: 111, 010, 100 and 110. Find the Boolean expression and the corresponding logic circuit. 2+2
- (7) Design a two-input XOR gate exclusively with the help of NAND gates. 2+2
- (8) Show that  $(A \oplus B) \oplus C = A \oplus (B \oplus C)$  2
- (9) Draw a logic circuit for adding two decimal number 7 and 17. Write down the result in binary. 2
- (10) Show by algebraic manipulation that (i)  $\overline{AB} + \overline{A} + AB = 1$  (ii)  $A + \overline{AB} = A + B$  (iii)  $AB + AC + \overline{BC} = AC + \overline{BC}$  (iv)  $(A+B)(B+C)(C+A) = AB + BC + CA$  (v)  $\overline{\overline{A} + B + \overline{A} + \overline{B}} = A$  (vi)  $(A+B) + (\overline{A} + C) = AC + \overline{AB}$  (vii)  $\overline{AB} + \overline{A} + AB = 1$  (viii)  $\overline{AB} + \overline{A} + AB = ?$  2+7
- (11) State and explain De Morgan's theorem. 2
- (12) Draw a logic circuit using NOR gates to implement the Boolean expression  $AB + \overline{BC}$ . 2
- (13) Design (i) an EX-OR gate (ii) an EX-NOR gate using NAND only. 2+2
- (14) Design (i) an EX-OR gate (ii) an EX-NOR gate using NOR only. 2+2