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LDRP INSTITUTE OF TECHNOLOGY & RESEARCH, GANDHINAGAR

B.E. Semester-IV

MID-SEM EXAMINATION (FEB-2015)

Date: 02/03/2015 **Branch: Electrical Engineering** Time: 12:00 to 1:30
Subject Name: Digital Electronics
Max. Marks: 30
Instructions:
1) All questions are **compulsory**
2) Figures to the **right** indicate full marks.
3) Use of scientific calculator is permitted
4) Indicate **clearly**, the options you attempt along with its respective question number.
5) Use the last page of main supplementary **for rough work**

Q.1.(a) Reduced the following Boolean Expressions: 5
  - $ABC[AB+\bar{C}(BC+AC)]$
  - $(WX+W\bar{Y})(X+W)+WX(\bar{X}+\bar{Y})$

(b) Do as Directed: 5
  - $(1101110.011)_2 = (\quad)_{10}$
  - $(2035)_8 = (\quad)_{16}$
  - $(42FD)_{16} = (\quad)_8$
  - $(2056)_8 = (\quad)_{10}$
  - $(A08F.EA)_{16} = (\quad)_{10}$

Q-2 (a) Show that $AB + \overline{(A+B)}$ is equivalent to $A\odot B$ with Truth Table and Logic diagrams. 5

(b) Explain De Morgan's Theorem with Truth Table and Logic Diagram. 5

OR

(a) Reduce the expression $\sum m(0,2,3,4,5,6)$ using mapping and implement it in AOI logic as well as in NAND logic. 5

(b) Reduce the expression $\sum m(0,1,2,3,5,7,8,9,10,12,13)$ using mapping and implement it in universal logic. 5

Q-3(a) Do as Directed: **5**
- $(10111.101)_2 + (110111.01)_2$
- $(173)_8 + (265)_8$
- $(A0FC)_{16} + (B75F)_{16}$
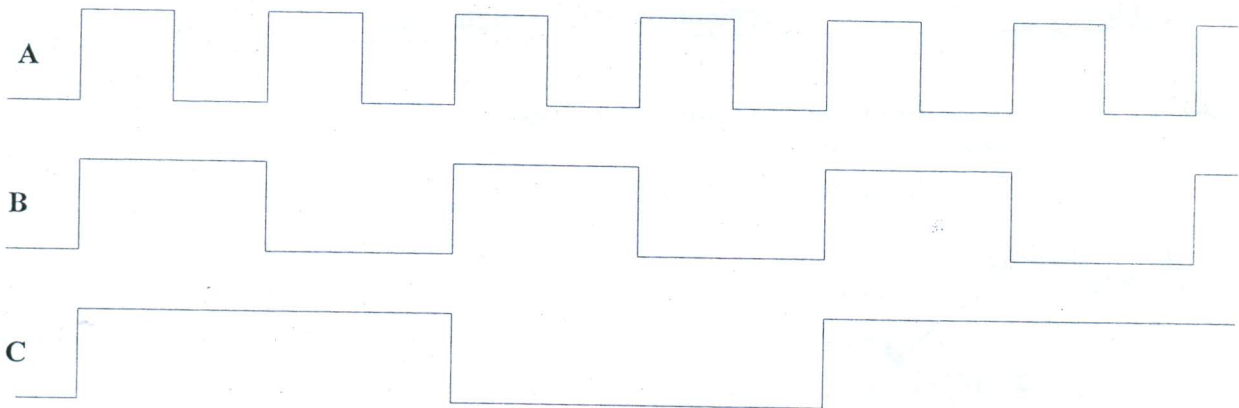- $(5A9B)_{16} \times (7)_{16}$
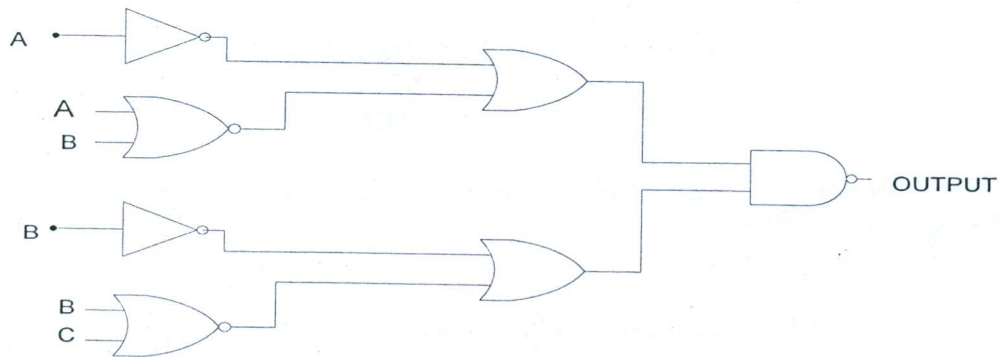- $(462)_8 - (175)_8$

(b) Prove that: **5**
- $AB + A(B+C) + B(B+C) = B + AC$
- $(A + \bar{A})(AB + AB\bar{C}) = AB$

OR

Q-3(a) If the three waveforms A, B and C Shown in Fig. are applied to a three input AND gate, **5** determine the resulting output waveform.

(b) Write the Boolean expression for the logic diagram given below and simplify it as much as **5** possible and draw the logic diagram that implements the simplified expression.

*****************All the Best*****************