

RAMAKRISHNA MISSION VIDYAMANDIRA

(A Residential Autonomous College)

Belur Math, Howrah

B.A./B.Sc. 1st Semester (July – December 2010)

Mid-Semester Examination, September 2010

Date: 09.09.2010

Electronics (General)

Full Marks 25

Time: 11 am – 12 noon

Answer any one question

1.
 - (a) What is the difference between analog and digital systems? Give answer only in your own words. How will you demonstrate basic gates simply using switches?
 - (b) Simplify the function $Y = A'BC + AB'C + ABC' + ABC$ by using Karnaugh Map and then draw the logic circuit.
 - (c) Construct a 16 to 1 MUX using 4 to 1 MUX and basic gates.
 - (d) Design a 4-bit BCD adder circuit using 4-bit parallel adders and basic gates only.
 - (e) State and prove De Morgan's theorem.
 - (f) Show that a full adder can be constructed using three half adders only.
(2+2)+4+5+5+3+4
2.
 - (a) What are binary numbers? If you are to digitize the voltage levels ranging from 10 volt to 120 volt, with 8 bits, then what will be resolution (in volt) of voltage reading?
 - (b) Implement the function $Y(A, B, C, D) = \sum (0, 1, 3, 5, 6, 7, 9, 12, 14)$ using mux.
 - (c) Illustrate the subtraction using 2's complement.
 - (d) Implement a logic circuit that enable a light to glow when only any one of the three switches in on.
 - (e) Implement the basic 2-bit comparator circuit using basic gates.
 - (f) Design a logic circuit using 4-bit parallel adder and basic gates, that performs subtraction of two 4-bit numbers using 1's complement method.
(1+3)+5+2+4+4+6