RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THIRD SEMESTER EXAMINATION, DECEMBER 2016

SECOND YEAR [BATCH 2015-18]

Date : 16/12/2016 **ELECTRONICS [General]**

Time : 11 am – 1 pm **Paper : III** Full Marks : 50

***Answer <u>any five</u> questions*:** [5×10]

1. a) Define accuracy, precision, resolution and sensitivity.
   b) Write the working principle of a CRT with the help of Schematic Diagram. [4+6]

2. a) Compare TTL, ECL and CMOS logic families.
   b) Realize 2-input NAND logic gates using TTL and CMOS logic respectively.
   c) Draw and explain the schematic of a CMOS Device. [3+3+4]

3. a) State and explain Moore's Law.
   b) Compare MSI, LSI and VLSI.
   c) Design a FULL-ADDER circuit using Verilog code. [3+3+4]

4. a) Draw a basic block diagram of a CRO.
   b) Explain how frequency and phase angle can be measured by a CRO using lissajous figures. [5+5]

5. a) Explain the method of measuring displacement using LVDT.
   b) State advantages of LVDT.
   c) An ac LVDT has the following data. Input = 6.3 V, output = 5.2 V, range ± 0.5 in. Determine
      (i) The output voltage vs core position for a core movement going form + 0.45 in to – 0.30 in.
      (ii) The output voltage when the core is at – 0.25 in from the centre. [5+2+3]

6. A strain gauge having a resistance of 350 Ω and a gauge factor of 2.1 is cemented to a structure subjected to a stress of $150\times10^6\ N/m^2$. The modulus of elasticity is $200\times10^9 N/m^2$. Find the change in resistance. Derive the equation also. [10]

7. Write short notes on <u>*any two*</u> of the following: [2 x 5]
   a) Design Domains of VLSI
   b) FPGA
   c) VLSI chips
   d) Transducers and its property

——— × ———