* A B - 3 1 2 0 *

AB-3120

Third Year B. Sc. (Sem. V) Examination

March/April – 2015

Physics : Paper - X

(Phy-5010 : Instruments & Digital Electronics)

Time : **2** Hours] [Total Marks : **50**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **Third Year B. Sc. (Sem. V)**

Name of the Subject :

☛ **Physics - X** *(Phy-5010 : Instruments & Digital Electronics)*

☛ Subject Code No. : **3 1 2 0** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Draw neat diagrams wherever necessary.

(3) Symbols used in the paper have their usual meaning.

(4) Figures to the right indicate full marks of the question.

1 Answer the following as required in brief: **8**

(i) Output $y = A \oplus A =$ _____.

(ii) Draw the symbol of Exclusive OR gate.

(iii) State De-Morgan's second theorem .

(iv) Draw pin diagram of (quad two input NAND gate) IC 7400.

(v) Atomic mass unit = _____ MeV.

(vi) Write any one, limitation of Aston's mass spectrograph.

(vii) Write any one use of electron Microscope.

(viii) Define mass Defect.

2 (a) Answer any one of the following in detail : **10**

(i) Describe the construction of Aston's mass spectrograph with necessary theory and show how it can be used in the detection of isotopes.

(ii) Give theory of Thomson's parabola method for positive ray analysis, with the help of diagram.

(b) Attempt any one of the following : 4

(i) What is positive Rays ? Write the properties of positive Rays .

(ii) Write uses of an electron microscope.

3 (a) Answer any one of the following in detail : 10

(i) Draw neatly the circuit diagrams for realizing AND and OR Logic using diodes and explain their operation .

(ii) Distinguish between half subtractor and full subtractor logic circuits writing the truth tables and drawing respective logic circuits.

(b) Attempt any one of the following : 4

(i) Distinguish between OR and Ex-OR gate.

(ii) Explain word comparator using X NOR.

4 Answer any two of the following : (short note) 14

(i) The full Adder

(ii) Karnaugh Map construction for two variables

(iii) Ultraviolet spectroscopy

(iv) The Dempster mass spectrograph.