S.Y. B.Sc. (With Credits)-Regular-Semester 2012 Sem III

B.Sc.23132 - Electronics Paper-II (Digital Electronics - I)

P. Pages : 1 **GUG/S/18/3337**

Time : Three Hours * 0 5 2 0 * Max. Marks : 50

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and well labelled diagram wherever necessary.

1. Either

a) What are SOP and POS form of equation? Explain with the help of suitable example simplify the following Boolean expressions using K-map. **4+3 +3**

i) $Y = \overline{A}B\overline{C}D + ABC\overline{D} + ABCD + A\overline{B}CD$

ii) $Y = \sum M(1,3,5,7,8,9,10,11,14,15)$

OR

b) Explain the concept of multiplexer. Draw the logic diagram of 4:1 MUX using logic gates and explain its working. **2+5 +3**
Explain the construction of 8:1 MUX using 4:1 MUX.

2. Either

a) Explain the concept of decoder. Draw the logic diagram of 1 of 10 decoder using logic gates and explain its working. **3+7**

OR

b) Draw the full adder circuit using half adder and explain its working. **5+5**
Give its Boolean expression and truth table. Draw and explain the logic circuit of 4 bits 2'3 complement Adder/ subtractor.

3. Either

a) What are disadvantages of clocked RSFF and how it can be eliminated in DFF? **7+3**
Differentiate between asynchronous and synchronous inputs in FFs.

OR

b) What is race around condition in JKFF? Draw the logic diagram of JKMSFF and explain its working. **3+7**
Give its truth table.

4. Either

a) What is ripple counter? **2+5**
Explain the working of 4-bits ripple counter. Give its truth table and timing diagram. **+3**

OR

b) What is synchronous counter? **3+7**
Why is it preferred?
Explain the working of 3-bits synchronous counter with the help of logic diagram.

5. a) Explain 1:4 demultiplexer and give its truth table. **2.5**
b) Explain decimal to BCD encoder with the help of logic diagram. **x4**
c) Explain the preset and clear inputs of FF with suitable logic diagram.
d) Explain the 3-bits Johnson counter. Give its truth table.

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