Bachelor of Science (F.Y. B.Sc.) (Part – I) (CBCS Pattern) Second Semester CBCS

# USELT04 - Electronics Paper – II : Digital Integrated Circuit

P. Pages : 2 **GUG/W/18/11579**

Time : Three Hours * 3 6 5 4 * Max. Marks : 50

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Notes : 1. All questions are compulsory.
2. All questions carry equal marks.
3. Draw neat and labelled diagrams wherever necessary.
4. Use of log tables calculators are allowed.

**1.** Either :

a) What are SOP and POS form of equation. Explain with suitable example. Simplify the following Boolean expression using k – map. **6**

$y = \overline{A}\overline{B}\overline{C}D + ABCD + ABC\overline{D} + A\overline{B}CD$ **4**

**OR**

b) Explain the concept of multiplexer. Draw the logic diagram of 4 : 1 MUX and explain its working. **3+7**

**2.** Either :

a) What are the disadvantages of clocked RSFF and now it can be eliminated in DFF. Explain.
Differentiate between Asynchronous and Synchronous input in FFS. **8+2**

**OR**

b) What is race around condition? Explain with suitable diagram how this race round condition can be eliminated in JKMS flip-flop. **3+7**

**3.** Either :

a) Explain the working of 4 bit ripple counter. Give its truth table and timing diagram. **6+4**

**OR**

b) What is Synchronous counter? State its advantages. Explain the working of 3 bit Synchronous counter with the help of logic diagram. **2+2 +6**

**4.** Either :

a) What is shift register? Explain construction and working of SIPO shift register. Give its truth table. **1+6 +3**

**OR**

b) What is A/D converter? Explain construction and working of successive approximation type ADC with suitable example. **2+8**

**5.** Attempt **any ten** of the followings. **1x10**

i) Draw logic diagram of full adder.

ii) Define encoder.

iii) What is Demultiplexer?

iv) What is negative edge triggering?

v) State the use of preset and clear inputs in flip flop.

vi) Draw logic diagram of RS Flip flop using NOR gates.

vii) What is modulus of counter?

viii) State the use of counter.

ix) Give the truth table of 3 – bit down counter.

x) Write the equation for 4 bit weighted resistor ladder type D/A Converter.

xi) Define accuracy in D/A Converter.

xii) What is sample and hold circuit.

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