S.Y. B.Sc. Sem. – III B.Sc. 23132

Electronics - II (Digital Electronics - I)

Paper - II

P. Pages : 3

Time : Three Hours Max. Marks : 50

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and well labelled diagram wherever necessary.
3. Use of log table and calculator is allowed.

1. Either

a) Draw a logic circuit for the Boolean equation: **4+6**

$Y = (A + BC)(B + \overline{C}A)$

Convert the above equation in SOP forms and implement it using NAND gates.

OR

b) What is demultiplexer? **1+**
Draw the logic diagram of 1:4 DEMUX and explain its working. **4+5**
Obtain the 1:8 DEMUX using 1:4DEMUX. Explain its working with truth table.

2. Either

a) Describe BCD to 7-segment decoder/driver and explain how it helps in showing different decimal digits in the display. **10**

OR

b) What is full adder? **1+**
Draw logic diagram of full adder and explain its working. **3+ 6**
Draw 4-bit 2's complement Adder/substractor circuit and explain its working.

3. Either

a) Explain the construction and working of JKFF. State its limitations. **3+ 2+**
How is it eliminated in JKMSFF? Explain. **5**

OR

b) What is flip-flop? Explain construction and working of clocked RSFF. and give its truth table. **6+ 4**
Explain the following
i) Edge and level triggering
ii) Propagation delay
iii) Set up time, and
iv) Hold time.

4. Either

a) Explain the construction and working of asynchronous 4-bit binary-up counter. Draw its timing diagram. Why is it called ripple counter ? **5+1+4**

The output of a ripple counter is DCBA=1001. After how many clock pulses the counter will have the same state? Explain.

OR

b) What is ring counter? How does it differ from a normal counter? Explain the construction and working of a 4-bit ring counter using JKMSFFs. State uses of ring counter. **1+2+5+2**

5. a) What is K-map? Explain. It with 3 variables. **2.5**

b) Draw logic diagram of half- adder. Give its truth table and Boolean equations. **2.5**

c) What is DFF? Explain. **2.5**

d) Draw the logic diagram of mod-8 synchronous counter and give its truth table. **2.5**

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