B.E.-Computer Science and Engineering Sem IV

CS 402 - DCFM (Digital Circuits & Fundamentals of Microprocessor)

P. Pages : 2 **GUG/W/16/3879**

Time : Three Hours * 4 0 0 4 * Max. Marks : 80

Notes : 1. All questions carry equal marks.
2. Retain the construction lines.
3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) State and prove De morgan's laws of Boolean algebra. What are the steps followed in reduction of boolean expression? **8**

b) What are SOP and POS farms of boolean expression? How do you convert an SOP to POS farm and vice-versa? **8**

OR

2 a) Reduce the following expression using kmap : $\Rightarrow$ **8**
$F(A,B,C,D)=\Sigma m(0,3,6,7,9,12,14)+d(4,8)$

b) Explain how will you use NAND gate as an universal gate. Realise $Y=A+BC\overline{D}$ using 2 input Nand gates only. **8**

3. a) What do you mean by cascading of parallel adder? Why is it requited? **8**

b) Design 4 bit binary to excess – 3 code converter. **8**

OR

4. a) Briefly describe the following. **8**
i) Ripple carry adder
ii) Look-ahead carry adder

b) What is a demultiplexer. Explain the working principle of demultiplexer with the help of 1:4 demux. **8**

5. a) What is meant by stable state? What do you mean by a latch and a gated latch? Explain SR flip flop in detail by giving excitation table. **8**

b) What is a random access memory [RAM] Explain the different types of RAM. **8**

OR

6. a) Explain the working of a bidirectional shift register with a neat diagram. **8**

b) Design a MOD-5 synchronous counter with sequence $S_2 \rightarrow S_4 \rightarrow S_6 \rightarrow S_7 \rightarrow S_3$ with remaining states locked to state S_2 this counter has a control line M, it M = O then counter acts as a down counter and is M = 1 counter acts as up counter draw truth table and circuit diagram neatly. **8**

7. a) Explain in detail the functions of following registers of μp 8085 in detail. **8**
i) Program counter.
ii) Stack pointer.

b) What do you understand by the term addressing modes? Give the status of flags and addressing modes and T-states required for the following instructions. **8**
i) JMP 2000H ii) INR M
iii) PUSH Rp iv) XTHL

OR

8. a) Write an assembly language program to find square of a given number. **8**

b) What are the various instructions for data transfer in microprocessor 8085. **8**

9. a) Give the difference between IO mapped IO ports and memory mapped IO ports. **8**

b) Write a sequence of instructions that enables RST 6.5 and RST 7.5 and disable RST 5.5 interrupts of μp 8085 **8**

OR

10. a) Explain the Handshaking mode of 8255 PPI. **8**

b) Draw the format of IO mode of 8255 PPI and explain in detail importance of each bit. **8**

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