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Roll No ....

EE-504 (GS)

B.E. V Semester

Examination, December 2017

Grading System (GS)

Digital Electronics and Logic Design

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) Each question having equal marks.

1. a) What are meant by the 1's and 2's complements of a binary numbers. Determine the number of bits required to represent in floating point notation the exponent for decimal numbers in the range of $10^{\pm 86}$.

   b) How are binary digits used to express the integer and fraction part of a number? Subtract $(1010)_2$ from $(1111)_2$ using the 2's complement method and subtract by direct method also and compare.

2. a) What do you mean by weighted binary codes. Explain BCD or 8421 Code with suitable example?

   b) What is a Hamming code and how is it used? A 7-bit Hamming code is received as 0101101. What is its correct code?

3. a) Verify that the following operations are commutative but not associative

   i) NAND

   ii) NOR

   Also prove the following Boolean Expression

   $(A+B)\left(\overline{A}\overline{C}+C\right)\left(\overline{\overline{B}+AC}\right)=\overline{A}B$

   b) Draw the basic BiCMOS inverter and explain its operation.

4. a) Explain "4-bit Binary-to-gray code converter".

   b) Obtain the minimum sum of products expression for the following function and implement the same using universal gates.

   $f\left(A,B,C,D\right)=\Sigma\left(0,2,3,5,7,8,13\right)+\Sigma d\left(1,6,12\right)$

5. a) Draw the logic diagram of master-slave D flip-flop using NAND gates.

   b) Realize J-K flip-flop using T flip-flop.

6. What is a ripple counter? Draw the gates necessary to decode all the stages of a MOD-16 counter using active-LOW outputs.

7. a) Explain the working of serial in parallel out shift register with logic diagram and waveform.

   b) Design a sequence generator to generator the sequence 1001.

8. Write short note (any two):

   a) EPROM (Erasable Programmable ROM)

   b) PSRAM (Pseudo Static RAM)

   c) Dual-Slop Analog and Digital Converter

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