PSG POLYTECHNIC COLLEGE, COIMBATORE - 641 004

Department of Electronics and Communication Engineering.

### Test -4 12.07.2019

### G18304 Digital Circuits Sem No : 3

### Time: 1.15 hours Max. Marks: 40

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| --- |
| Instructions :   1. Answer All Questions either (a) Division or (b) Division. 2. Each question carries 20 marks. 3. Division (a) and (b) has three subdivisions (i),(ii) and (iii) which carries **3** marks, **5** marks and **12** marks respectively. |

1. a.i) What are the advantages of digital system over analog system (3)

ii) Explain the operation of a NPN transistor with its characteristics

(5) (5)

iii)a. Convert the decimal number 84.56 into binary, octal and hexadecimal

b. Convert the Hexa decimal number AB.CD in to decimal, octal and

Hexadecimal (12)

(OR)

b.i) Perform binary addition for 11100011 + 11011011 (3)

ii) Perform binary subtraction, multiplication and division

0110110.11, 00011100.11 (5)

iii)a. Perform Signed binary one’s and two’s complement addition and

Subtraction for (55)10, (45)10 b. Explain BCD Code with example (12)

2.a. i) What is a positive logic and negative logic ? (3)

ii) Explain Logic Gates with its truth table (5)

iii) a. State Booleans laws, identities, postulates and Explain the

Demorgans Theorem

b. Minimize the Boolean equation F(A,B,C)=(A+B)(A+C) and

Represent using logic gates (12)

(OR)

b. i) Compare TTL logic with CMOS logic (3)

ii) Realize the logic gates using NAND Logic, simplify the equation

f= a’b’c’d’+a’bcd using NAND logic (5)

iii) Simplify F ={ 2,3,4,6,7,8,9} and d={1,10,11} using K MAP and explain the CMOS Logic (12)

/END/

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### Internal test-1 18.07.2019

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1. a.i) What is the digital system? What are its advantages? (3)

ii) Explain the operation of a diode with its characteristics.

(5) (5)

iii)a. Convert the 1110111.111 into decimal, binary, octal and hexadecimal

b. Convert the Hexadecimal number 78A.3B into decimal, octal and

Decimal. (12)

(OR)

b.i) Perform one’s complement and two’s complement for 1100001001 (3)

ii) Perform binary addition, subtraction, multiplication and division

(25)10,(10)10  (5)

iii) a. Perform Signed binary one’s and two’s complement addition and

Subtraction for (8)10, (9)10 b. Explain BCD code with example (12)

2.a. i) Simplify y=((ab+c’)((a+b)’+c))’ using Boolean identities (3)

ii) Explain Logic Gates with its truth table (5)

iii) a. State Booleans laws, identities, postulates and Demorgans Theorem

b.Minimize the Boolean equation prove

a’b’c’+a’b’c+a’bc’+a’bc+ab’c’=a’+(b+c)’ and Represent using logic

gates (12)

(OR)

b. i) Define source current, sink current, fan-in and fan-out. (3)

ii) Realize the logic gates using NAND Logic, simplify the equation

Y=(A+C)(A+D’)(A+B+C’) using NAND logic (5)

iii) Simplify the equation Y= a’b’c’d’+a’b’cd+a’bcd’+abc’d’ using kmap

and explain TTL Logic with its circuit diagram.(12)

/END/

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and explain TTL Logic with its circuit diagram.(12)

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